

# LIFEPAK® 12 DEFIBRILLATOR/MONITOR

Works like  
you work.™





Everyday, you make a difference.

## Your job demands more.

Use a tool that can tackle today's patient care needs and adapt to tomorrow's challenges.

The gold standard for more than 30 years, LIFEPAK products are continually evolving to keep pace with the changing nature of patient care. The LIFEPAK 12 defibrillator/monitor packs multi-parameter therapeutic and diagnostic functions into a single, portable device.

Over 80,000 LIFEPAK 12 defibrillator/monitors are in use today—on rescue rigs and in hospitals worldwide. Feedback from this global community keeps us innovating—adding features to help you in your lifesaving work.



Trusted

# EVOLUTION

Keeping pace as patient care evolves.



Here are highlights of advances since its first release:

**1998**

The LIFEPAK 12 defibrillator/monitor revolutionizes acute cardiac care, with expanded diagnostic and monitoring capabilities.

**1999**

LIFEPAK 12 defibrillator/monitor is enhanced with ADAPTIV™ biphasic technology up to 360J, NIBP and CO<sub>2</sub> monitoring capabilities.

**2001**

Among many features added to the 12 are ST Monitoring up to 8 hours and invasive pressure monitoring.

**2004**

Bluetooth® capabilities enable wireless transmission of 12-lead ECGs.

**2007**

cprMAX™ technology provides increased flexibility for protocols to maximize CPR.

STEMI Management technology enables secure and flexible flow of ECG data, linking EMS and hospitals for improved STEMI treatment.

The LIFEPAK 12 defibrillator/monitor revolutionized acute cardiac care in 1998, with expanded diagnostic and monitoring capabilities.

As your job grows, so does the 12.



Complemented by a rich range of services and options.

## Technical Field Service

We offer one of the largest and best-trained networks of technical service representatives in the industry. On call 24 hours a day, 7 days a week (North America), our goal is to return your phone call within two hours, to work with you to quickly assess the problem and find the best solution. An integral part of your team, our field service reps have an average tenure of more than 12 years and log an average of 2,400 field hours each year. We work with you to design a customized service offering that meets your needs. Options include a comprehensive plan covering repair, preventative maintenance and inspection; or plans limited to repair-only or inspection-only.

## Training

Whether you are taking delivery of your first LIFEPAK 12 defibrillator/monitor, or adding new options, your sales rep will provide inservice training to help you get the most from your Physio-Control products. Specialized training—ranging from self-paced CDs to live webcasts to on-site classes—is also available for features such as End-tidal CO<sub>2</sub> monitoring and 12-lead ECG. Continuing education credits are available for some offerings.

## Grant Consultation

This complimentary program helps Physio-Control customers streamline the grant research and writing process. Free assistance is provided to communities, hospitals, law enforcement, fire and EMS agencies in applying for grants to upgrade equipment, implement new programs, and provide training. Customers receive guidance on identifying funding sources, timing grant applications, and crafting a grant proposal to improve the likelihood of success.

## Accessories

We offer a full catalog of more than 150 accessories to suit your needs, including options for batteries, paddles, electrodes and cables.



Meeting the demands of your changing job.

## Easy to use when every second counts

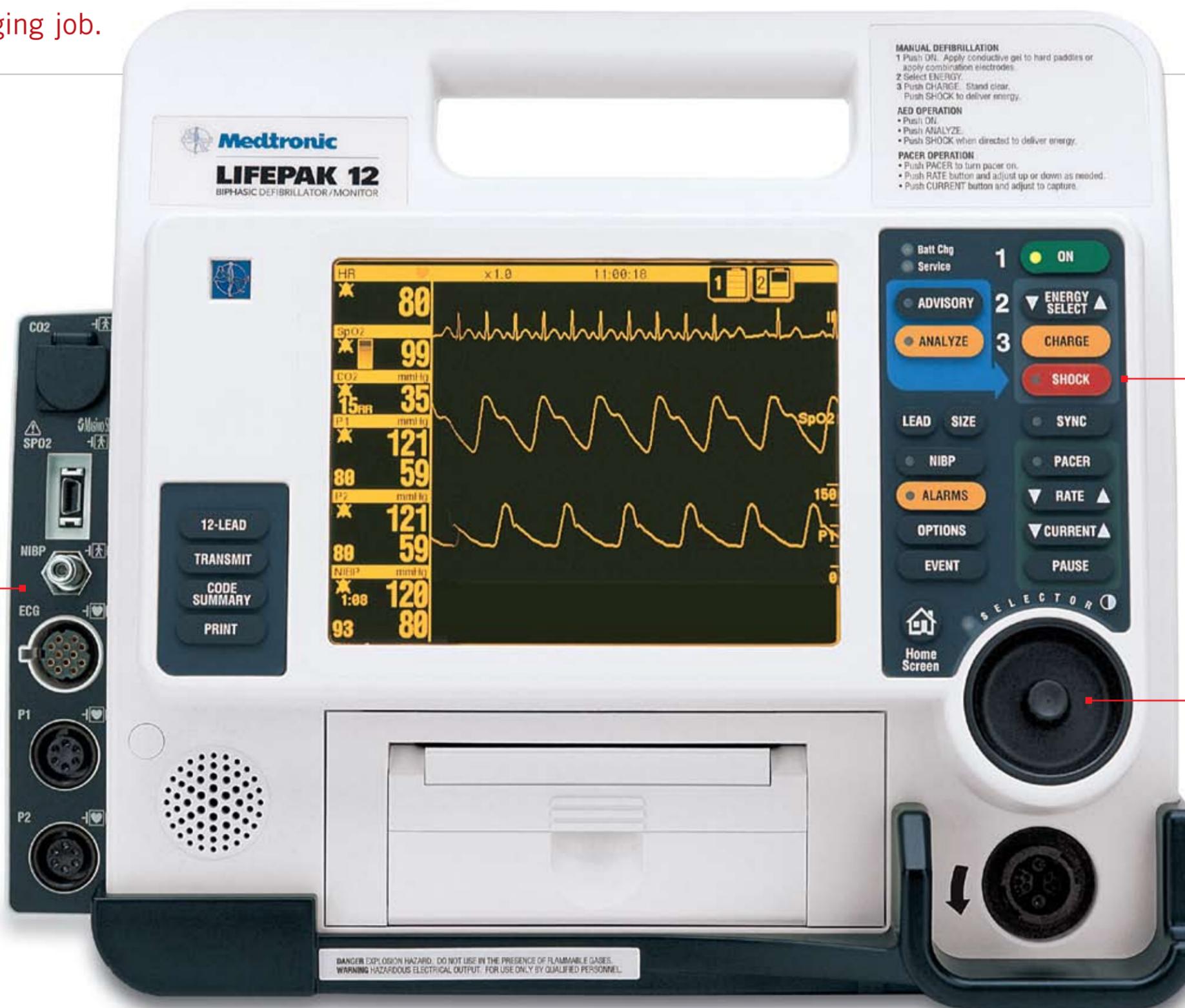
The 12 is designed to work like you work—in the most demanding conditions and environments.

- Generously sized screen lets you quickly scan clutter-free waveforms and monitoring data.
- Stands up to rugged use—drop test/impact test of 18 inches; IPX4 rating.

### SETTING THE STANDARD ON MONITORING TO INFORM PATIENT CARE

The pioneer in prehospital 12-lead ECG acquisition and transmission, Physio-Control continues to advance the state of the art, with ST Monitoring to quickly identify changes in a patient's 12-lead ECG.

- The 12 is the only defibrillator/monitor on the market today\* with an ST Monitoring feature. Because ECGs (and the diagnosis) can change so significantly so quickly, the device takes a series of ECGs at frequent intervals and alerts you to changes in a patient's ST measurement.
- The 12 helps track patient status breath by breath with patented Microstream® capnography technology and FilterLine® accessories that operate smoothly even in high humidity. EtCO<sub>2</sub> monitoring is effective for both intubated and nonintubated patients.
- Graphic display of vital signs allows for evaluation of changes in patient condition and patient response to therapy over time.
- MASIMO SET® pulse oximetry offers accurate and stable oxygen saturation monitoring.



**MANUAL DEFIBRILLATION**  
 1 Push ON. Apply conductive gel to hard paddles or apply combination electrodes.  
 2 Select ENERGY.  
 3 Push CHARGE. Stand clear. Push SHOCK to deliver energy.

**AED OPERATION**  
 • Push ON.  
 • Push ANALYZE.  
 • Push SHOCK when directed to deliver energy.

**PACER OPERATION**  
 • Push PACER to turn pacer on.  
 • Push RATE button and adjust up or down as needed.  
 • Push CURRENT button and adjust to capture.

**ESCALATING DOSE TO 360J TO MAXIMIZE DEFIBRILLATION SUCCESS**

Get the option to escalate to the highest energy available in a defibrillator/monitor today.\* LIFEPAK defibrillators with ADAPTIV biphasic technology offer the maximum range of energy settings, up to 360 joules.

For patients who need additional shocks, increasing the dose of subsequent shocks above the first shock has shown to be a better strategy for terminating VF than simply repeating a failed dose.<sup>1,2,3</sup>

\* As of October 2007.

**SELECTOR KNOB MAKES IT SIMPLE TO SCROLL THROUGH AND QUICKLY SELECT FUNCTIONS.**

DANGER EXPLOSION HAZARD. DO NOT USE IN THE PRESENCE OF FLAMMABLE GASES.  
 WARNING HAZARDOUS ELECTRICAL OUTPUT. FOR USE ONLY BY QUALIFIED PERSONNEL.



Setting the standard. Raising the bar.

## Improving treatment with secure flow of ECG data

Mortality for Acute Coronary Syndrome (ACS) has been shown to increase 40% if door-to-balloon time stretches from 90 minutes to 120 minutes.<sup>4</sup>

Transmitting 12-lead ECGs from the field so hospitals can confirm STEMI diagnosis and activate the cardiac cath lab before the patient arrives can help you meet the ACC/AHA 90-minute door-to-balloon guideline for STEMI patients.<sup>5</sup> The LIFENET STEMI Management Solution links EMS response with hospitals via the internet to improve treatment and management of patients with ACS. Using cutting edge technology, 12-lead ECG data is sent from the 12 to a network of receiving targets in the ED, cath lab, or anywhere the LIFENET Client software is installed, so patient data can be shared quickly. This technology enables hospitals to make patient care decisions such as referral to a PCI capable hospital, or cath lab activation, all while you are still en route.

Studies have reported a significant association between prehospital 12-lead ECGs and shorter door-to-balloon times. Two recent studies found the effect was strongest when the cath lab was activated while the patient was still en route to the hospital.<sup>6,7</sup>



### Medical Informatics

**LIFENET® STEMI Management Solution.** Our cutting-edge technology facilitates a seamless, secure and flexible flow of ECG data between prehospital, emergency room, and PCI treatment centers, enabling you to improve door-to-balloon times and reduce false-positive cath lab activations. A virtual STEMI care network linking EMS response with hospitals is created using our web application and secure datacenter and your gateway devices like SmartPhone PDAs. While paramedics in the field focus on patient care, a gateway device sends diagnostic quality ECGs wirelessly from the LIFEPAK defibrillator to the proper destination, helping you meet the ACC/AHA 90-minute door-to-balloon guideline for STEMI patients. The system works on a variety of wireless carrier networks and requires no dedicated hardware. Application services—including a state-of-the-art datacenter that maximizes security and system availability—are provided on a subscription basis. Several levels of support are available to meet your needs.

**CODE-STAT™ 7.0 Data Review Software with Advanced CPR Analytics.** This post-event review tool annotates chest compressions onto the patient's continuous ECG report and calculates CPR statistics, helping you meet 2005 AHA Guidelines. The software simplifies data collection and reporting by consolidating all dispatch, treatment and outcome data into a single e-file. With this single tool, you can download, review, manage and analyze emergency medical data from multiple LIFEPAK defibrillators. The application also facilitates quality analysis and business decisions, allowing creation of benchmarking and trending reports to review your system's performance.

**DT EXPRESS™ Data Transfer Software.** The simple Windows-based software application manages data from LIFEPAK devices. The software makes it easy to download critical event and waveform data to your PC, add supplemental patient data, print out a hardcopy report, and store records on a disk. For storage and on-screen viewing of reports, export files to CODE-STAT 7.0 data review software.

Powerful

# Specifications

## GENERAL

The **LIFEPAK 12 defibrillator/monitor series has five main operating modes:**

**Advisory Mode (SAS):** Provides all features available except manual defibrillation, synchronous cardioversion and pacing

**Manual Mode:** Provides normal operating capability for ALS users

**Setup Mode:** Allows operator to customize the device

**Service Mode:** Allows operator to execute device diagnostic tests and calibrations

**Inservice Mode:** Provides simulated waveforms for demonstration purposes

## POWER

**Battery Only Configuration:** Choice of NiCd (FASTPAK® battery, FASTPAK 2 battery, LIFEPAK NiCd battery) or SLA (LIFEPAK SLA battery)

Dual battery capability

Optional external AC Power Adapter

Batteries charge while device operates from Power Adapter

**Operating Time:** Two new fully charged batteries will provide the following prior to shutdown:

	TOTAL				AFTER LOW BATTERY			
	Typical	Min.	Typical	Min.	Typical	Min.	Typical	Min.
Monitoring (minutes)								
NiCd*	110	81	60	43	10	6	2	1
NiCd**	155	114	85	62	14	8	2	1
NiCd***	220	162	120	86	20	12	4	2
SLA	180	132	100	73	16	10	2	1
Defibrillation (360 joule discharges)								
NiCd*	80	72	45	40	7	7	3	3
NiCd**	110	99	60	54	10	10	3	3
NiCd***	160	144	90	80	14	14	6	6
SLA	145	131	85	76	12	12	3	3
Monitoring plus Pacing (minutes at 100ma, 60ppm)								
NiCd*	105	75	60	42	9	6	2	1
NiCd**	145	104	85	60	12	8	2	1
NiCd***	210	150	120	84	18	12	4	2
SLA	170	122	100	71	14	10	2	1

\*FASTPAK, FASTPAK, FASTPAK 2 (11141-000044, 11141-000025)

\*\*LIFEPAK NiCd (11141-000027)

\*\*\*LIFEPAK NiCd (11141-000026)

**Low Battery Indication and Message:** Low battery icon at top of display and low battery message in status area for each battery. When low battery is indicated, device autoswitches to second battery. When both batteries reach a low battery condition, there is a voice prompt to replace battery.

**Warmstart:** With inadvertent loss of power (<30 seconds) device retains settings

**Service Indicator:** When an error is detected

## PHYSICAL CHARACTERISTICS

**Weight:** Basic defibrillator/monitor with QUIK-COMBO® cable: 6.6kg (14.5 lbs) (unit and QUIK-COMBO cable only, no batteries). Add 0.3 lbs when configured with front case guard.

**FASTPAK and FASTPAK 2 Battery:** .6kg (1.3 lbs)

**LIFEPAK NiCd Battery:** 0.8kg (1.7 lbs)

**LIFEPAK SLA Battery:** 1.3kg (2.8 lbs)

**Standard Paddles (hard):** 0.9kg (1.9 lbs)

**Height:** 31.7cm (12.5 in)

**Width:** 39.6cm (15.6 in)

**Depth:** 23.1cm (9.1 in)

## DISPLAY

**Size (active viewing area):**

**LCD:** 140.8mm (5.5 in) wide x 105.6mm (4.2 in) high

**EL:** 165.1mm (6.5 in) wide x 123.8mm (4.9 in) high

**Resolution:**

640 x 480 black and white LCD

640 x 480 amber and black EL display

User selectable LCD contrast

Displays a minimum of 4 seconds of ECG and alphanumeric for values, device instructions or prompts

Option to display one or two additional waveforms

**Waveform Display Sweep Speed:** 25mm/sec for ECG and 12.5mm/sec of CO<sub>2</sub>

## DATA MANAGEMENT

The device captures and stores patient data, events (including waveforms and annotations), user test results and continuous ECG waveform records in internal memory.

The user can select and print reports and transfer the stored information via an internal modem through landline or mobile phones.

**Report Types:** Three format types of CODE SUMMARY™ critical event record (short, medium and long)

- Initial ECG (except short format)

- Automatic capture of vital signs measurements every 5 minutes

- 3-channel or 4-channel 12-lead ECG report

- Continuous waveform records (transfer only)

- Trend Summary – includes patient information, vital signs log and vital signs graphs

- Vital Signs – includes patient information, event and vital signs log

- Snapshot – includes patient information and 8 seconds of ECG captured at the time of transmission

**Memory Capacity:** Two full-capacity patient records that include:

CODE SUMMARY critical event record – up to 100 single waveform events

Continuous Waveform – 45-minute continuous ECG record

## COMMUNICATIONS

The device is capable of transferring data records by internal modem, external EIA/TIA modem, cellular modem or serial connection

Bluetooth wireless data transfer to cell phone to LIFENET RS receiving station

Supports EIA/TIA-602 compatible modems using Xon/Xoff or RTS/CTS flow control at 9600 to 38400 bps

EIA/TIA-RS232E compatible at 9600, 19200, 38400 and 57600 bps

Group III, Class 2 or 2.0 fax

## MONITOR

**Voice Prompts:** Used for selected warnings and alarms (configurable on/off)

## ECG

**ECG is monitored via several cable arrangements:**

A 3-wire cable is used for 3-lead ECG monitoring

A 5-wire cable is used for 7-lead monitoring

A 10-wire cable is used for 12-lead acquisition. When the chest electrodes are removed, the 10-wire cable functions as a 4-wire cable.

Standard paddles or QUIK-COMBO pacing/defibrillation/ECG electrodes or FAST-PATCH® disposable defibrillation/ECG electrodes are used for paddles lead monitoring

**Lead Selection:** Leads I, II, III, (3-wire ECG cable)

Leads I, II, III, AVR, AVL and AVF acquired simultaneously (4-wire ECG cable)

Leads I, II, III, AVR, AVL, AVF, V1 (Labeled “C” on 5-wire ECG cable)

Leads I, II, III, AVR, AVL, AVF, V1, V2, V3, V4, V5 and V6 acquired simultaneously, (10-wire ECG cable)

**ECG Size:** 4, 3, 2.5, 2, 1.5, 1, 0.5, 0.25 cm/mV (fixed at 1 cm/mV for 12-lead)

**Heart Rate Display:** 20 to 300 bpm digital display

**Out of Range Indication:** Display symbol “—”

Heart symbol flashes for each QRS detection

**Continuous Patient Surveillance System (CPSS):** In advisory mode while Shock Advisory System™ is not active, CPSS monitors the patient, via paddles or Lead II ECG, for potentially shockable rhythms

**Analog ECG Output:** 1V/mV x 1.0 gain

**Common Mode Rejection:** 90dB at 50/60Hz

## SpO<sub>2</sub>

**MASIMO SET Sensors**

**Saturation Range:** 1 to 100%

**Saturation Accuracy:** (70–100%) (0–69% unspecified)

**Adults/Pediatrics:**

+/- 2 digits (during no motion conditions)

+/- 3 digits (during motion conditions)

**Neonates:**

+/- 3 digits (during no motion conditions)

+/- 3 digits (during motion conditions)

Dynamic signal strength bar graph

Pulse tone at the onset of the pleth waveform

**SpO<sub>2</sub> Update Averaging Rate:** User selectable 4, 8, 12 or 16 seconds

**SpO<sub>2</sub> Measurement:** Functional SpO<sub>2</sub> values are displayed and stored

**Pulse Rate Range:** 25 to 240 pulses per minute

**Pulse Rate Accuracy:** (Adults/Pediatrics/Neonates)

+/- 3 digits (during no motion conditions)

+/- 5 digits (during motion conditions)

SpO<sub>2</sub> waveform with autogain control

## NIBP

**Oscillometric measurement**

**Systolic Pressure Range:** 30 to 245mmHg

**Diastolic Pressure Range:** 12 to 210mmHg

**Units:** mmHg, kPa

**Mean Arterial Pressure Range:** 20 to 225mmHg

**Blood Pressure Accuracy:** maximum mean error of ± 5mmHg with a standard deviation no greater than ± 8mmHg

**Pulse Rate Range:** 30 to 200 pulses per minute

**Pulse Rate Accuracy:** ± 2 pulses per minute or ± 2% whichever is greater

**Typical Measurement Time:** 40 secs

## EtCO<sub>2</sub>

**Microstream technology**

**Measurement range:** 0 to 99mmHg

**Display:** CO<sub>2</sub> waveform and EtCO<sub>2</sub> numerics

**Units:** mmHg, kPa, %; user selectable

Automatic ambient pressure compensation

**CO<sub>2</sub> Accuracy (>20 minutes):** 0 to 38mmHg: ± 2mmHg39 to 99mmHg: ± 5% of reading + 0.08% for every 1mmHg

**Warm Up Time:** 30 seconds (typical), 180 seconds max

**Response Time:** 2.9 seconds (includes delay time and rise time)

**Respiration Rate Range:** 0 to 60 breaths per minute

**Respiration Rate Accuracy:** 0 to 40 bpm: ± 1 bpm, 41 to 60 bpm: ± 2 bpm

## Invasive Pressure (2 channels)

**Measurement Range:** -30 to +300mmHg in six user selectable ranges

**Display:** IP waveform and numerics

**Units:** mmHg, kPa

**User-selectable Labels:** ART, PA, CVP, ICP, LAP

**Transducer Type:** Strain-gauge resistive bridge

**Transducer Sensitivity:** 5mV/V/mmHg

**Bandwidth:** 0 - 30 Hz (<-3dB)

**Numeric Accuracy:** ± 1mmHg or 2% of reading, whichever is greater, plus transducer error

**Leakage Current:** Meets ANSI/AAMI/IEC requirements

## Trend

**Display:** Choice of HR, SpO<sub>2</sub>(%), EtCO<sub>2</sub>, RR, NIBP, P1, P2, ST shown in channels 2 or 3

**Time Scale:** Auto, 30 minutes, 1, 2, 4 or 8 hours

**Duration:** Up to 8 hours with -06 Memory PCB or later. Reduced storage capacity with earlier versions.

**ST Segment:** After initial 12-lead ECG analysis, automatically selects and trends lead with the greatest ST displacement

## ALARMS

**Quick Set:** Activates alarms for all parameters

**VF/VT Alarm:** Activates continuous CPSS monitoring in Manual Mode

**Apnea Alarm:** Occurs when 30 seconds have elapsed since last detected respiration

## INTERPRETIVE ALGORITHMS

**12-Lead Interpretive Algorithm:** GE Medical 12SL, Includes AMI statement

## PRINTER

**Prints continuous strip of the displayed patient information**

**Paper Size:** 50mm (2.0 in) or optional 100mm (3.9 in)

**Print Speed:** 25mm/Sec +/- 5% (measured in accordance with AAMI EC-11, 4.2.5.2)

**Delay:** 8 seconds

**Autoprint:** Waveform events print automatically (user configurable)

Optional 50mm/sec timebase for 12-lead ECG reports

## FREQUENCY RESPONSE

**Diagnostic:** 0.05 to 150Hz or 0.05 to 40Hz (user configurable)

**Monitor:** 0.67 to 40Hz or 1 to 30Hz (user configurable)

**Paddles:** 2.5 to 30Hz

**Analog ECG Output:** 0.67 to 32Hz (except 2.5 to 30Hz for Paddles ECG and 1.3 to 23Hz for 1 to 30Hz monitor frequency response)

## DEFIBRILLATOR

**Waveform:** Biphasic truncated exponential with voltage and duration compensation for patient impedance

**Energy Accuracy:** ±1 joule or 10% of setting, whichever is greater, into 50 ohms

±1 joule or ±5%, whichever is greater, of 50 ohm value into 25 to 200 ohms\*

**Paddle Options:** QUIK-COMBO pacing/defibrillation/ECG electrodes (standard)

FAST-PATCH disposable defibrillation/ECG electrodes (optional)

Standard Paddles (optional)

Internal Handles with discharge control (optional)

External Sterilizable Paddles (optional)

**Cable Length:** 2.4m (8 ft) long QUIK-COMBO cable (not including electrode assembly)

## Manual

**Energy Select (Biphasic):** 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 30, 50, 70, 100, 125, 150, 175, 200, 225, 250, 275, 300, 325, and 360 joules or user configurable sequence 100 to 360 joules

**Energy Select (Internal):** 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 30 and 50 joules

**Charge Time:** Charge time to 360J in less than 10 seconds, typical

**Synchronous Cardioversion:** Energy transfer begins within 60ms of the QRS peak

## AED

**Shock Advisory System (SAS):** an ECG analysis system that advises the operator if the algorithm detects a shockable or non-shockable ECG rhythm. SAS acquires ECG via therapy electrodes only.

**Shock Ready Time:** Using a fully charged battery at normal room temperature, the device is ready to shock within 20 seconds if the initial rhythm finding is “Shock Advised”

**Output Energy (Biphasic):** User configurable, sequence of three sequential shock levels ranging from 150-360 joules (200-360 joules, Japan)

\* Note: ±5% accuracy applies when disposable therapy electrodes are attached. Energy output is limited to the available energy which results in delivery of 360 joules into 50 ohms.

cprMAX technology setup options (Items marked with \* are default settings):

- Stacked shocks: off\*, on

- Initial CPR: off\*, analyze first, CPR first

- Preshock CPR: off\*, 15, 30 seconds

- Pulse check: never\*, after second no shock advised, after every no shock advised, always

- CPR time 1 & 2: 15, 30, 45, 60, 90, 120\*, 180 seconds, 30 minutes

## PACER

**Pacing Mode:** Demand or non-demand rate and current defaults (user configurable)

**Pacing Rate:** 40 to 170ppm

**Rate Accuracy:** +/- 1.5% over entire range

**Output Waveform:** Monophasic, truncated exponential current pulse (20 + 1ms)

**Output Current:** 0 to 200mA

**Pause:** Pacing pulse frequency reduced by a factor of 4 when activated

**Refractory Period:** 200 to 300ms +/-3% (function of rate)

## ENVIRONMENTAL

**Temperature, Operating:** 0° to 50°C (32° to 122°F)  
SpO<sub>2</sub>: 5° to 45°C (41° to 113°F)

**Temperature, Non-operating:** -20° to +60°C (-4° to 140°F) except therapy electrodes and batteries

**Relative Humidity, Operating:** 5 to 95%, non-condensing

**Atmospheric Pressure, Operating:** Ambient to 429mmHg (0 to 4572m) (0 to 15,000 ft)

**Water Resistance, Operating:** IPX4 (splash proof) per IEC 60529 (with batteries and cables installed)

**EMC:** IEC 60601-1-2: 2001/EN 60601-1-2:2001, Medical Equipment-General Requirements for Safety-Collateral Standard: Electromagnetic Compatibility-Requirements and Tests

IEC 60601-2-4:2002; Clause 36/EN 60601-2-4:2003; Clause 36, Particular Requirements for the Safety of Cardiac Defibrillators and Cardiac Defibrillator monitors

**Shock (drop):** Five drops on each side from 18 in. onto a steel surface

**Vibration:** MIL-STD-810E Method 514.4, Propeller Aircraft – category 4, Helicopter – category 6 (3.75g), and Ground Mobile – category 8 (3.14g)

## AC POWER ADAPTER

### Function

**Dimensions:** 27.7 x 16.8cm (10.9 x 6.6 in)

**Weight:** < 2.3kg (<5 lbs) (including cables)

**Charge Time (with fully depleted battery):**

**FASTPAK and FASTPAK 2:** 1.5 hours

**LIFEPAK NiCd:** 2.1 hours

**LIFEPAK NiCd:** 3.0 hours

**LIFEPAK SLA:** 6 hours typical, 12 hours maximum

**AC Input:** Accepts line power from both: 90 to 264VAC, 47 to 63Hz (domestic/international)108 to 118VAC, 380 to 420Hz (military)

**Fuses:** Two 250V fuses (100 to 200V: T5A; 220 to 240V: T2.5A) in the power input module

### Environmental



The most field-proven defibrillator/monitor in the world.



Experience the legendary quality that has made LIFEPAK products the clear favorite around the world—for every level of responder.

For more than 50 years, Physio-Control, maker of the renowned LIFEPAK defibrillators, has been developing technologies and designing devices that are legendary among first response professionals, clinical care providers and citizens everywhere.

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MIN 3207916-000 / CAT 26500-002742