LIFEPAK® 12 DEFIBRILLATOR/MONITOR

Works like you work.™
Your job demands more.
You need equipment that can help you 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.

Nearly 100,000 LIFEPAK 12 defibrillator/monitors are in use today—in hospitals and on rescue rigs worldwide. Feedback from this global community keeps us innovating—adding features to help you in your lifesaving work.

**Powerful**
**Trusted**
**Evolving**
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.

Advances since initial 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 CO₂ monitoring capabilities.

2001
- Among many features added to the 12 are ST Monitoring up to 8 hours and invasive pressure monitoring.

2003
- MASIMO® SpO₂ technology added to the 12.

2006
- MASIMO SET™ LNCS sensors offer accurate and stable oxygen saturation monitoring.

2007
- cprMAX™ technology provides increased flexibility for protocols to maximize CPR.
- STEMI Management technology enables secure and flexible flow of ECG data, linking hospitals and EMS for improved STEMI treatment.

EVOLUTION
Keeping pace as patient care evolves.
Training
Whether you are taking delivery of your first LIFEPAK 12 defibrillator/monitor or adding new options, Physio-Control provides a broad set of product and clinical training materials designed to help you keep your staff’s skills up-to-date. The 12 also has on-site inservice and off-site Biomed training solutions available for purchase.

Accessories
We offer a full catalog of accessories and disposable products to suit your needs. Standard adult paddles, pediatric paddles attachments, sterilizable adult paddles and internal paddles provide flexible therapy options for all hospital departments.

Customization
Configure the 12 to your exact specifications. When it comes to knowing system requirements, you’re the expert. Select AED, manual defibrillation or both, depending on users’ skills and comfort levels. Add-on options like noninvasive pacing, SpO2, 12-lead analysis, EtCO2 and NIBP are available. Choose among 50 mm or 100 mm printers, accessories and power options.

Easy Upgrades
We understand how rapidly your job is evolving. So we’ve designed the LIFEPAK 12 series platform with upgrades in mind. You can add new features and enhancements as systems change. You can also extend your effectiveness as 12 modifications and new functionality become available in the future.

Heart Safe Hospital Assessment
Our free Heart Safe Hospital Assessment program analyzes your existing equipment and resuscitation practices in light of current guidance from healthcare-related organizations such as AHA and JCAHO. We identify gaps and recommend steps to align your facility with the latest guidelines and clinical evidence related to treatment of cardiac arrest.

Complemented by a rich range of services and options.
A dependable, portable device you can trust - every single time

The 12 works like you work—in the most demanding situations.

- Large screen and durable design are ideal for transport.
- Compact size requires little space in the Emergency Department or Operating Room, and eliminates the need for single-purpose monitoring equipment.
- Configurable options including AED and manual defibrillation modes allow for ease of patient transfer.
- User interface and accessories are similar across all LIFEPAK products, allowing for standardization and continuity of care throughout the hospital.

The LIFEPAK 12 defibrillator/monitor comes equipped with industry-standard monitoring tools for adult and pediatric patients. At every level, you’ll find the 12 to be the right tool, with the right capabilities—for faster response times and better-informed treatment decisions.

- The 12 is the only defibrillator/monitor on the market today* with an ST Monitoring feature. Because ECGs (and the diagnosis) can change significantly and 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. ETCO2 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.
- Oscillometric noninvasive blood pressure (NIBP) monitoring, provides artifact rejection and automatic measurement modes.

*September 2008
Escalating dose to 360J to maximize defibrillation success

Get the broadest therapeutic dose—up to 360J—for difficult-to-defibrillate patients. 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.1,2,3

Selector knob makes it simple to scroll through and quickly select functions.
The LIFEPAK 12 defibrillator/monitor series has five main operating modes:

- **Advisory Mode (SAS):** Provides all features available except manual defibrillation, synchronized 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

Battery charge while device operates from Power Adapter

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

<table>
<thead>
<tr>
<th>Total</th>
<th>After Low Battery</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCD EL LCD EL</td>
<td>Min</td>
</tr>
<tr>
<td>NiCd®</td>
<td>110</td>
</tr>
<tr>
<td>NiCd®*</td>
<td>155</td>
</tr>
<tr>
<td>NiCd®**</td>
<td>220</td>
</tr>
<tr>
<td>SLA</td>
<td>180</td>
</tr>
</tbody>
</table>

**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 |

**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

**GENERAL**

**Weight:** Basic defibrillator/monitor with QUIK-COMBO® cable: 6.7kg (14.8 lbs) (unit and QUIK-COMBO® cable only, no batteries).

FASTPAK and FASTPAK 2 Battery: 8kg (17.6 lbs)
LIFEPAK NiCd Battery: 0.8kg (1.7 lbs)
LIFEPAK SLA Battery: 1.3kg (2.8 lbs)

**PHYSICAL CHARACTERISTICS**

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

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

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

**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

**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)

**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 pads or Lead II ECG, for potentially shockable rhythms

**Analog ECG Output:** 11V/mV x 1.0 gain

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

**SpO2**

**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**

**SpO2 Update Averaging Rate:** User selectable 4, 8, 12 or 16 seconds

**SpO2 Measurement:** Functional SpO2 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)
- +/- 3 digits (during motion conditions)

**SpO2 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:** Mean arterial 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
EtCO₂
Microstream technology
Measurement range: 0 to 99mmHg
Display: CO₂ waveform and EtCO₂ numerics
Units: mmHg, kPa, %; user selectable
Automatic ambient pressure compensation
CO₂ Accuracy (>20 minutes): 0 to 38mmHg; ±2mmHg, 39 to 99mmHg ± 5% of reading ± 0.08% for every mmHg
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: ±0.4 bpm to 40Hz (user configurable)
Delay: 8 seconds (followed by one hour temperature stabilization in normal room temperature, the device is ready to shock once normal function is re-engaged)

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, IOP, LAP, P1, P2
Transducer Type: Strain-gage resistive bridge
Transducer Sensitivity: 5µV/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, SpO₂(%), EtCO₂, RR, NIBP, P1, P2, ST
Time Scale: Auto, 30 minutes, 1, 2, 4 or 8 hours
Duration: Up to 8 hours with -31 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/VF Alarm: Activates continuous CPSS monitoring in Manual Mode
Apaena 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 25Hz 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*
* 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.
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)

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 ± 1.5ms)
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)
SpO₂: 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)
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, (figure 514.4-7 spectrum 4), Helicopter – category 6 (3.75 Grms), and Ground Mobile – category 8 (3.14 Grms)

AC POWER ADAPTER
Function
Dimensions: 27.7 x 5.1 x 16.8cm (10.9 x 2.0 x 6.6 in)
Weight: < 2.3kg (-5 lbs) (including cables)
Charge Time (with fully depleted battery):< 2.3kg (<5 lbs) (including cables)
FASPTAK and FASTPAK 2: 1.5 hours
LIFEPAK NiCd: 2.1 hours
LIFEPAK SLA: 9 hours typical, 12 hours maximum
Power requirements: 90-132/198-264VAC, 47-63Hz (Domestic/International), 100 - 118VAC, 380 - 420Hz (Military)

Environmental
Water Resistance: IPX1 (vertical drops) per IEC 60529
Altitude, Operating: To 4572m (15,000 ft)
Altitude, Non-operating: To 5500m (18,045 ft)
Humidity: 5 to 95% non-condensing
Temperature, Operating: 0 to 50°C (32” to 122°F)
Temperature, Storage: -40 to 71°C (-40 to 158°F) (followed by one hour temperature stabilization in operating temperature range before operating)
Vibration, Operating and Non-operating: MIL-STD-810E, Method 514.4 Categories 4, 6, 8
All specifications are at 20°C unless otherwise stated.
Physio-Control provides complete patient care monitoring and defibrillation solutions to reduce total cost of ownership and ensure compatibility with earlier systems whenever possible. Integrated solutions provide the right service options, disposables, cables, accessories and data offerings.

Experience the legendary quality that has made LIFEPAK products and services the clear favorite around the world.

Defibrillators/Monitors

**LIFEPAK 20e Defibrillator/Monitor**
Building on the design of its predecessor, the LIFEPAK 20e defibrillator/monitor is compact, lightweight and easy to rush to the scene or use during transport. The 20e is highly intuitive to use, putting early, effective defibrillation into the hands of first responders. The 20e skillfully combines AED function with manual capability so that ACLS-trained clinicians can quickly and easily deliver advanced diagnostic and therapeutic care. Clinically advanced and packed with power, the 20e uses lithium-ion battery technology that provides extended monitoring time for transporting patients from one area of the hospital to another and includes ADAPTIV™ biphasic technology up to 360J.

**LIFEPAK 1000 Defibrillator**
Providing a powerful yet compact way to treat cardiac arrest patients, its intuitive, simple operation is ideal for first responders, and includes built-in flexibility for more advanced patient care. The 1000 is designed for external areas of the hospital where a simple-to-use AED with the option of manual defibrillation is required.

**LIFEPAK CR® Plus Automated External Defibrillator**
Designed for use by the first person at the scene of a sudden cardiac arrest. Ideal for the minimally trained rescuer, the CR Plus guides the rescuer step-by-step with calm, clear voice prompts. The simplicity of the CR Plus means it’s ideal for non-acute hospital areas.
CPR Assistance

LUCAS™ Chest Compression System
Designed to provide effective, consistent and uninterrupted compressions according to AHA/ERC Guidelines, the device is used on patients in hospital and out-of-hospital settings. LUCAS is translucent, except for the hood and piston, making it the ideal chest compression device for use in the cath lab. Maintaining high-quality, hands-free compressions frees responders to focus on other lifesaving therapies.

Data Management and Connectivity Tools

LIFENET® STEMI Management Solution
Enabling a seamless, secure and flexible flow of ECG data among prehospital to hospital helps you quickly identify STEMI patients, improve door-to-balloon times and reduce false-positive cath lab activations. A complete Web-based STEMI management solution, our system requires no dedicated equipment, servers or maintenance from your IT department.

CODE-STAT™ 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 to help you meet current AHA/ERC Guidelines. The software simplifies data collection and reporting by consolidating all dispatch, treatment and outcome data into a single e-file. 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
Consolidate data from your sudden cardiac arrests and emergency transports into your hospital information systems. The simple Windows®-based software application manages data from LIFEPAK defibrillator/monitors. The software makes it easy to download critical event and waveform data to your PC, add supplemental patient data, print a hardcopy report, and store records on a disk. For storage and on-screen viewing of reports, export files to CODE-STAT data review software.
For more than 50 years, Physio-Control, maker of the renowned LIFEPAK defibrillators, has been developing technologies and designing systems that are legendary among first response professionals, clinical care providers and the community.

REFERENCES

