

LIFEPAK® 20e DEFIBRILLATOR/MONITOR

Always
on call





No wonder medical professionals trust the **LIFEPAK 20e**

For more than 50 years, Physio-Control has been developing technologies and designing devices that are legendary among first response professionals, clinical care providers and the community. The LIFEPAK 20 series was first designed for the hospital, but today medical professionals around the world—including both ALS and BLS providers—rely on the LIFEPAK 20e defibrillator/monitor. Easy enough for first responders—yet sophisticated enough for the cardiac team—you can trust the 20e, wherever you are in the hospital.



Trust means being ready

Cardiac arrest can happen anywhere in the hospital. In the emergency department. In the recovery room. As a medical professional, you're on the frontline of medical care—and you need cutting-edge devices you can depend on.

That's why we offer the LIFEPAK 20e defibrillator/monitor. We understand that each role within the hospital needs a device that works for them, whether it's the nursing staff, code team, rapid response team, biomed or intensive care department. The 20e is a single device ideal for any area of your facility because it's like having two defibrillators in one. It features a dual mode design—with an intuitive door system—for both AED and manual use. It's a simple effective AED for first responders, yet it easily transforms into a manual defibrillator for advanced care professionals.

The two modes of the 20e also make it easy to configure to your patient protocols or make changes recommended by the American Heart Association and the European Resuscitation Council.



Trust means easy-to-use, advanced technology

Physio-Control products are at the forefront of medical technology. All of our LIFEPAK defibrillators feature full energy up to 360J, the highest in the industry. At the same time, we also know the easiest to operate devices are often the most effective. The LIFEPAK 20e defibrillator/monitor is intuitive, yet includes sophisticated features that make a real difference.

For difficult-to-defibrillate patients, the 20e uses our ADAPTIV™ biphasic technology for the maximum range of energy settings—up to 360 joules. For patients who need additional shocks, this has been shown to be a better strategy for terminating shockable heart rhythms in patients who need more than one shock.^{1,2}

LIFEPAK 20e defibrillator/monitor: two defibrillators in one.

Early defibrillation with AED Mode

An ideal crash cart device, the 20e puts early, effective defibrillation into the hands of first responders. The unit features a highly intuitive design with a “closed door” system. When the door is closed, the unit is in AED mode, which ensures that basic responders are presented only with the controls they need for fast, easy operation. In addition, the proven Shock Advisory System™ features loud voice prompts and clear, simple graphics to guide responders through the 3-step operation. Throughout the process, CODE-SUMMARY™ critical event record captures critical moments from the instant the unit is switched on, including cardiorespiratory events, a vital signs log and the associated waveforms.

Powerful flexibility with Manual Mode

When the code team or ALS provider arrives, the 20e easily converts to manual mode through a simple push of the latch door. Advanced care professionals will get more advanced monitoring parameters, such as noninvasive pacing, ECG monitoring (3- or 5-wire), and synchronized cardioversion. Masimo SET® pulse oximetry offers accurate and stable oxygen saturation monitoring, for quick and effective clinical decisions under conditions of both active movement and low perfusion.* Finally, your hospital teams will have plenty of power; the Lithium-ion battery technology provides extended operating time for transporting patients from one area of the hospital to another.

AED Mode



Manual Mode



*Optional cable required to meet alternate monitoring needs.

Trust means getting the support you need

Physio-Control doesn't just provide medical devices. We also want you to have the support you need. Whether you're purchasing your first LIFEPAK 20e defibrillator/monitor or adding new options and services, rest assured you will get product and clinical training materials designed to help you keep your staff's skills up-to-date. The 20e also has on-site service and off-site biomed training solutions available. In addition, we offer a full catalog of accessories and disposable products that can help you provide flexible therapy options for all hospital departments.

Finally, our free Heart Safe Assessment program provides your hospital a written report providing information on guidelines and recommendations issued by healthcare-related organizations such as AHA, ERC and JCAHO. The key areas addressed are the 3-minute early defibrillation goal, defibrillator standardization, defibrillator life expectancy, monophasic and biphasic devices. The report identifies gaps and recommends steps to align your facility with the latest guidelines.



Trust means the ability to save lives

We do everything we can to help you save lives. Every LIFEPAK product comes with the assurance that it's designed for clinical professionals by clinical professionals. We analyze, test and validate real-world field data and customer feedback so we can improve the design of our products to meet your specific needs.

You can see the result of our efforts with the LIFEPAK 20e defibrillator/monitor.

- It's ready when you are
- It's simple, yet powerful
- It's flexible, and does exactly what you need, where and when you need it
- The 20e works like you do—and that makes all the difference in the world

Make a difference in your hospital with the LIFEPAK 20e defibrillator/monitor. Contact your local Physio-Control representative or visit www.physio-control.com.




The Physio-Control family of products

When it comes to patient health, you have enough to worry about. Let us help. We provide complete patient care monitoring and defibrillation solutions that make a real difference in hospitals around the world. Whether you need a defibrillator/monitor, AED, CPR Assistance, or data management tools, our innovative, flexible products are sure to meet your needs. And because all our systems are fully compatible, you'll be able to standardize across your entire facility and lower your total cost of ownership.

LIFEPAK® Defibrillators/Monitors



LIFEPAK 15 Monitor/Defibrillator

 The LIFEPAK 15 monitor/defibrillator is the new standard in emergency care for ALS teams who want the most clinically innovative, operationally innovative and LIFEPAK TOUGH™ device available today. The 15 integrates Masimo Rainbow® SET® technology that monitors SpO₂, Carbon Monoxide and Methemoglobin, includes a metronome to guide CPR compressions and ventilations and provides an option to escalate energy to 360J. An entirely new platform, the 15 is powered by Lithium-ion battery technology, incorporates the SunVue™ display screen for viewability in bright sunlight, and data connectivity to easily and securely collect and send patient information. Similar form factor and user interface with the LIFEPAK 12 defibrillator/monitor will ease transition and training costs. Well-suited for use anywhere in the hospital.



LIFEPAK 1000 Defibrillator

The 1000 is a powerful and compact device designed to treat cardiac arrest patients and provide continuous cardiac monitoring capabilities. Built-in flexibility allows the 1000 to be programmed for use by first responders or professionals and enables care providers to change protocols as standards of care evolve. A large, intuitive screen displays graphics and ECG readings that are clear and easy to read from any angle and in bright sunlight. The most rugged AED in the LIFEPAK fleet, you can carry the 1000 with confidence into the harshest environments. Well-suited for use in clinics within your hospital campus.



LIFEPAK CR® Plus AED

Designed for minimally trained rescuers in commercial and public settings, the CR Plus guides the rescuer step by step with calm, clear voice prompts. Simple to use, it is built with the same advanced defibrillation technology used by EMS and hospital personnel. Well-suited for use in public areas of the hospital, such as the lobby, parking garage or cafeteria.

CPR Assistance



LUCAS™ Chest Compression System

Designed to provide effective, consistent and uninterrupted compressions according to AHA Guidelines, the device is used on adult patients in out-of-hospital and hospital settings. Maintaining high-quality hands-free compressions frees responders to focus on other lifesaving therapies. Available in both air-powered and battery powered versions. Well-suited for crash cart use, in the emergency department or in the cardiac cath lab.

Data Management/Connectivity Tools

LIFENET® System

The LIFENET System provides EMS and hospital care teams with reliable, quick access to clinical information helping to improve patient care flow and operational efficiency. The LIFENET System provides customers with a reliable and secure web-based platform linking care teams with critical information for emergent patient data and post-event review. From providing an advanced alert of an incoming patient, to reviewing post event data, to tracking assets, the LIFENET System is the most comprehensive system on the market today.

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 onscreen viewing of reports, export files to CODE-STAT data review software.

Specifications

GENERAL

The LIFEPAK 20e defibrillator/monitor has seven main operating modes:

Manual Mode: Provides a normal operating capability for ALS users. Allows access to manual mode energy selections up to 360J, synchronized cardioversion and pacing. ECG waveform is displayed.

AED Mode: Provides a normal operating capability for BLS users. All user features are available except manual defibrillation, synchronized cardioversion, pacing, and access to archived patient records. Provides shock energy defaults up to 360J. User selectable option to display ECG waveforms and/or visual AED prompts.

Setup Mode: Allows the operator to configure the device settings

Service Mode: Allows the operator to execute diagnostic tests and calibrations, to display device module software and hardware versions, and to display and print the diagnostic code log

Inservice Mode: Simulated waveforms are available for demonstration purposes. The waveforms consist of short segments of realistic data, which are repeated to form a continuous waveform.

Archive Mode: Provides operator the opportunity to access records of previous patients for review, transmission, printing, editing or deletion

Auto Test Mode: Performs daily self tests

POWER

The device is an AC line operated device with an internal battery as backup.

AC Powered: 90–132 VAC 50/60Hz, 198–264 VAC 50/60 Hz, total power draw less than 120 Volt-Amperes (VA)

Internal Battery Backup: Lithium-ion. Battery charges while device operates from AC Power.

Operating Time: A new fully-charged internal backup battery will provide the following prior to shutdown:

	TOTAL	AFTER LOW BATTERY
Monitoring plus SpO ₂ : (minutes):	210	5
Monitoring, plus pacing (at 100 ma, 60 ppm), plus SpO ₂ (minutes):	110	2
Defibrillation (360J discharges):	140	3

Battery Charge Time: <4 hours when device is powered off and AC power is applied

Low Battery Indication and Message: When the device is unplugged from AC power, it switches to battery. When the battery gets low, the battery status indicator displays one yellow segment and a “low battery” message and warning tone occurs. Shortly thereafter the status indicator displays one flashing red segment, the “low battery; connect to AC power” message appears, and a warning tone occurs.

Service Indicator: LED illuminates when service is required

PHYSICAL CHARACTERISTICS

Weight:

- Fully featured defibrillator/monitor (pacing, SpO₂ and door, without paper or cables) 5.58 kg (12.3 lbs)
- QUIK-COMBO® cable: 0.20 kg (.43 lbs)
- Standard (hard) paddles: 0.88 kg (1.95 lbs)

Height: 21.3 cm (8.4 in)

Width: 26.2 cm (10.3 in)

Depth: 26.2 cm (10.3 in)

DISPLAY

Size (active viewing area): 115.18 mm (4.53 in) wide x 86.38 mm (3.4 in) high

Resolution: 320 x 240 dot color active LCD

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

Option to display one additional waveform

Waveform display sweep speed: 25 mm/sec for ECG

DATA MANAGEMENT

The device can easily print a CODE SUMMARY™ report, including an introduction with patient information and critical event record. The summary report also includes event and vital signs log, and waveforms associated with certain events. The device can print archived patient records and has two data communication ports—infrared (IrDA) and a direct serial port, which supports a serial data cable.

COMMUNICATIONS

The device is capable of transferring data records by IrDA version 1.0

MONITOR

ECG

ECG can be monitored through 3-wire or 5-wire ECG cables. Standard paddles or therapy electrodes (QUIK-COMBO pacing/defibrillation/ECG electrodes or FAST-PATCH® disposable defibrillation/ECG electrodes) are used for paddles lead monitoring. Compatible with LIFEPAK 12 ECG and therapy cables

Lead Selection:

Leads I, II and III, (3-wire ECG cable)

Leads I, II, III, AVR, AVL, and AVF, V (c) acquired simultaneously, (5-wire ECG cable)

ECG size: 4, 3, 2.5, 2, 1.5, 1, 0.5, 0.25 cm/mV

Heart Rate Display: 20–300 bpm digital display

Out of Range Indication: Display symbol “---”

Heart symbol flash for each QRS detection

Continuous Patient Surveillance System (CPSS): In AED mode, while Shock Advisory System is not active, CPSS monitors the patient via QUIK-COMBO paddles or Lead II ECG for potentially shockable rhythms.

Voice Prompts: Used for selected warnings and alarms (Configurable On/Off)

Analog ECG Output: 1V/mV x 1.0 gain < 35 ms delay

Common Mode Rejection: 90 db at 50/60 Hz

SpO₂

Masimo SET

- Additional configuration available for compatibility with select Nellcor 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)
- +/- 5 digits (during motion conditions)

SpO₂ waveform with autogain control

ALARMS

Quick Set: Activates alarms for all parameters

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

PRINTER

Prints continuous strips of the displayed patient information

Paper size: 50 mm (2.0 in)

Print speed: Continuous ECG 25 mm/sec +/- 5% (measured in accordance with AAMI EC-11, 4.2.5.2)

Delay: 8 seconds

Autoprint: Waveform events print automatically (user configurable)

Print Speed for CODE SUMMARY Reports: 25 mm/sec

FREQUENCY RESPONSE

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

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

Paddles: 2.5 to 30 Hz

Analog ECG Output: 0.67 to 32 Hz (except 2.5 to 30 Hz for paddles ECG)

DEFIBRILLATOR

Waveform: Biphasic Truncated Exponential. The following specifications apply from 25 to 200 ohms, unless otherwise specified.

Energy Accuracy: ±1 joule or 10% of setting, whichever is greater, into 50 ohms ±2 joule or 15% of setting, whichever is greater, into any impedance from 25–100 ohms

Voltage Compensation: Active when disposable therapy electrodes are attached. Energy output within ± 5% or ± 1 joule, whichever is greater, of 50 ohm value, limited to the available energy which results in the delivery of 360 joules into 50 ohms.

PATIENT IMPEDANCE	PHASE 1 DURATION (MS)		PHASE 2 DURATION (MS)	
	MIN.	MAX.	MIN.	MAX.
25	5.1	6.0	3.4	4.0
50	6.8	7.9	4.5	5.3
100	8.7	10.6	5.8	7.1
125	9.5	11.2	6.3	7.4

Paddle Options:

- QUIK-COMBO pacing/defibrillation/ECG electrodes (standard)
- Standard adult paddles with embedded pediatric paddles (optional)
- Internal handles with discharge control (optional)
- External sterilizable paddles (optional)

Cable length: 2.4 meter (8-foot) long QUIK-COMBO cable (not including electrode assembly)

MANUAL

Energy Select: 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 and user configurable sequence of 100–360, 100–360, 100–360 joules

Charge time:

- Charge time to 200J <5 seconds with fully charged battery
- Charge time to 360J <7 seconds with fully charged battery
- Charge time to 360J <10 seconds while not in low battery operations

Synchronized Cardioversion:

- Energy transfer begins within 60 ms of the QRS peak
- Energy transfer begins within 25 ms of the External Sync Pulse
- External Sync Pulse; 0–5V (TTL Level) Pulse, active High, > 5 ms in duration, no closer than 200 ms apart and no further than 1 second apart

AED

Shock Advisory System is an ECG analysis system that advises the operator if the algorithm detects a shockable or nonshockable 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 16 seconds of power on, if initial rhythm finding is "Shock Advised"

The AED mode of the LIFEPAK 20e defibrillator/monitor is not intended for use on children less than 8 years of age. 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

Users should refer to the LIFEPAK 20e defibrillator/monitor operating instructions for details on how to customize the configuration of their devices to hospital protocols.

PACER

Pacing Mode: Demand or nondemand rate and current defaults (user configurable)

Pacing Rate: 40 to 170 ppm

Rate Accuracy: +/- 1.5% over entire range

Output Waveform: Monophasic, amplitude stable to +/- 5% relative to leading edge for currents greater than or equal to 40 mA, Duration 20 +/- 1 ms, Rise/Fall times <= 1 ms [10–90% levels]

Output Current: 0 to 200 mA

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

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

ENVIRONMENTAL

Temperature, Operating: 5 to 40° C (41 to 104°F)

Temperature, Nonoperating: -20 to +60° C (-4 to +140° F) except therapy electrodes

Relative Humidity, Operating: 5 to 95%, noncondensing

Atmospheric Pressure, Operating: Ambient to 522 mmHg (0 to 3,048 meters) (0 to 10,000 feet)

Water Resistance, Operating (without accessories except for ECG Cable and hard paddles): IPX1 (spillage) per IEC 60601-1 clause 44.6

Vibration: MIL-STD-810E Method 514.4, Cat 1

Shock (Drop): 1 drop on each side from 45.7 cm (18 in.) onto a steel surface

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

All specifications are at 20° C (68° F) unless otherwise stated.

LIFEPAK 20e defibrillator/monitor

www.physio-control.com

REFERENCES

- 1 Stiel IG, Walker RG, Nesbitt LP, et al. Biphasic Trial: A randomized comparison of fixed lower versus escalating higher energy levels for defibrillation in out-of-hospital cardiac arrest. *Circulation*. 2007;115:1511-1517.
- 2 Koster RW, Walker RG, Chapman FW. Recurrent ventricular fibrillation during advanced life support care of patients with prehospital cardiac arrest. *Resuscitation*. 2008;78:252-257.

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