PHYSIO CONTROL

LIFEPAK® 20e DEFIBRILLATOR/MONITOR

Works like you work.™


When cardiac arrest occurs, the clock starts ticking.
Respond quickly with confidence.

LIFEPAK 20e defibrillator/monitor. Two defibrillators in one.

AED Mode
Easy to use for early defibrillation

- An ideal crash cart device, the *20e* puts early, effective defibrillation into the hands of first responders.
- The closed door reduces the "confusion factor" and ensures basic responders are presented with only the controls they require to facilitate fast and easy operation.
- The *20e* is highly intuitive, making it easy for infrequent AED-trained responders to quickly understand and use.
- The proven Shock Advisory System™ from Physio-Control guides users through 1-2-3 step operation, with loud voice prompts and clear, simple graphics.

Manual Mode
Flexible for advanced care professionals

- When the code team arrives, the *20e* easily converts to manual mode—with a push of the latch the door opens—automatically converting to a manual defibrillator.
- For quick and effective clinical decisions, more advanced monitoring parameters such as ECG, external pacing and pulse oximetry are displayed clearly through color-matched waveforms and values.
- Lithium-ion battery technology provides extended operating time for transporting patients from one area of the hospital to another.

In support of early defibrillation, the American Heart Association recommends first-responding personnel should be trained and encouraged to perform defibrillation, "with the goal of providing the first shock for any sudden cardiac arrest within 3 minutes of collapse".[1] Hospital first responders equipped with a LIFEPAK 20e defibrillator, can make the lifesaving difference for victims of sudden cardiac arrest.


You’ve got enough to worry about.

Always ready.
Respond quickly to the care of your patients.

Ready

Easy to Use

Powerful

Flexible

With any LIFEPAK product, you can be assured it's designed for clinical professionals, by clinical professionals. We continually analyze, test and validate real-world field data and customer feedback to evolve the product design to meet your hospital's needs—so it *works like you work.*

Ready — Device readiness is easy with automated daily self-tests, viewable readiness display and a battery gauge that provides assurance your device is ready to accompany you to a code or transport a patient within the hospital.

Easy to Use — The simple, intuitive user interface and clear, comprehensive prompts empower trained users to respond quickly with confidence.

Powerful — Escalating energy up to 360J provides the options you need for maximum defibrillation success. For patients who need more than one shock, increasing the dose of subsequent shocks has been shown to be a better strategy for terminating shockable heart rhythms.[2,3,4]

Flexible — With two display options, the *20e* is easy to configure to your patient care protocols, or make changes as recommended by the American Heart Association and European Resuscitation Council.

LIFEPAK® 20e DEFIBRILLATOR/MONITOR

Clinically advanced and packed with power

SETTING THE STANDARD ON MONITORING TO GUIDE TREATMENT DECISIONS

The LIFEPAK 20 series was the first defibrillator/monitor designed specifically for the hospital market. Physio-Control continues to be at the forefront of improving patient care with *20e* and CODE SUMMARY™ to report a critical event record, including an cardiorespiratory event, vital signs log and the associated waveforms.

- Using the data in the CODE-SUMMARY report, clinical teams can use CODE-STAT™ Data Review Software, to annotate chest compressions onto the patient's continuous ECG report and calculate CPR statistics. Now you can facilitate quality analysis, helping you drive improvements to resuscitation outcomes.
- Vital signs monitoring allows for evaluation of changes in patient condition and patient response to therapy over time.
- The *20e* offers 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. (Optional cable required to meet alternate monitoring needs.)

SPEED DIAL MAKES IT SIMPLE TO SCROLL THROUGH AND QUICKLY SELECT FUNCTIONS

Complemented by a rich range of services and options

Training

Whether you are taking delivery of your first LIFEPAK 20e defibrillator/monitor, or adding new options, Physio-Control provides a broad set of product in-servicing and clinical training materials designed to help you keep your staff's skills up-to-date. The *20e* also has on-site inservice, and off-site Biomed, training solutions available for purchase.

ON-SCREEN BATTERY STATUS INDICATOR DISPLAYS REAL-TIME STATUS OF AVAILABLE BATTERY CAPACITY PROVIDING AT-A-GLANCE DEVICE READINESS

Lithium-ion battery technology provides increased operating time and flexibility for intra-hospital transport use.

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.[2,3,4]

REMOVABLE DOOR PROVIDES EASY TRANSITION FROM FIRST RESPONDERS TO CODE TEAM

Accessories

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

Heart Safe Hospital Assessment

Our free Heart Safe 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.

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, SpO_2 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 alphanumerics 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

SpO_2

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

SpO_2 Update Averaging Rate: User selectable 4, 8, 12 or 16 seconds

SpO_2 Measurement: Functional SpO_2 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_2 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 IMPEDENCE	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

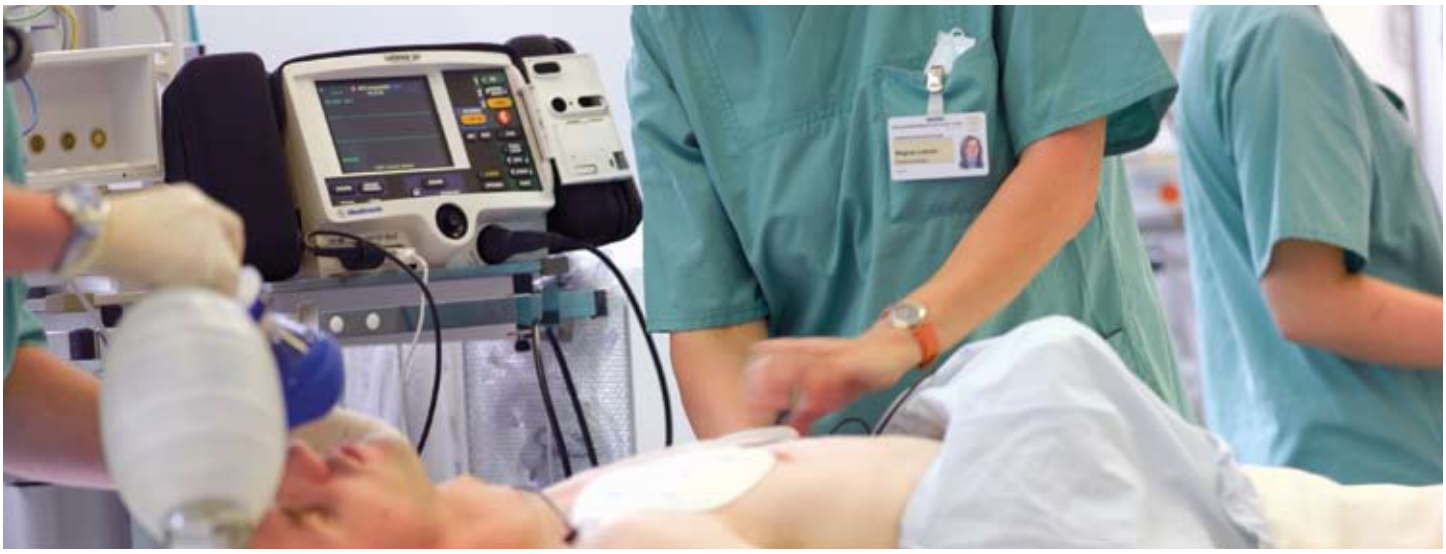
Shock (Drop): 1 drop on each side from 45.7 cm (18 in.) onto a steel surface

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.



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

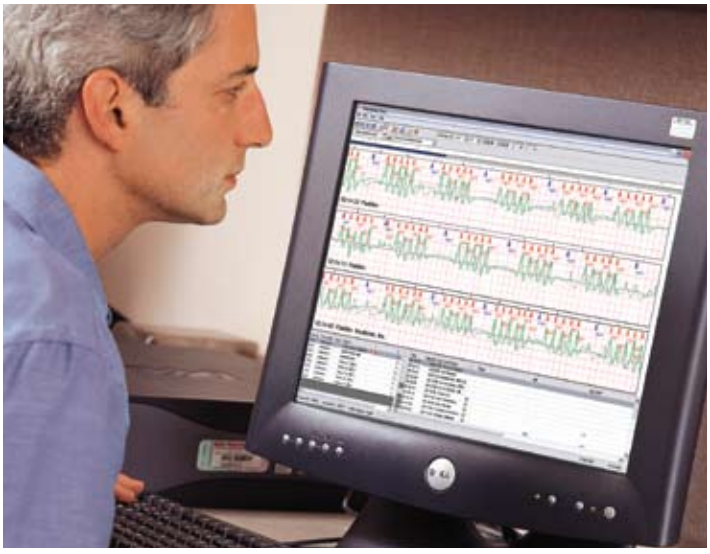
Physio-Control provides complete patient care monitoring and defibrillation solutions to reduce total cost of ownership and ensure compatibility with earlier systems whenever possible. Integrated solutions provide the right service options, disposables, cables, accessories and data offerings.

Defibrillators/Monitors

LIFEPAK 12 Defibrillator/Monitor
Therapeutic and diagnostic functions combine in a single, portable device for both hospital and prehospital teams. The innovative platform design provides full-featured ADAPTIV™ biphasic defibrillation technology and industry-standard monitoring. Ideal for areas in the hospital where advanced parameters are needed such as the Emergency Department or Critical Care.

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 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 devices that are legendary among first response professionals, clinical care providers and the community.

REFERENCES

1 Guidelines 2005 for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation* 2005; 112(24): IV-39.

2 Stiell 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.

3 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.

4 Walsh SJ, McClelland AJJ, Owen CG, et al. Efficacy of distinct energy delivery protocols comparing two biphasic defibrillators for cardiac arrest. *AM J Cardiol.* 2004;94:378-380.

For further information please contact your local Physio-Control representative or visit www.physio-control.com

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