PHYSIO CONTROL

PRODUCT BROCHURE

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, biomeds 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 and services

Defibrillators/Monitors

LIFEPAK CR® Plus Automated External Defibrillator
Featuring the same advanced technology trusted by emergency medical professionals—yet simple to use—the fully-automatic LIFEPAK CR Plus AED is designed specifically for the first person to respond to a victim of sudden cardiac arrest.

LIFEPAK® 1000 Defibrillator
The LIFEPAK 1000 Defibrillator 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.

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 effective, and LIFEPAK TOUGH device available today.

LIFEPAK® 20e Defibrillator/Monitor
Clinically advanced and packed with power, the LIFEPAK 20e defibrillator/monitor is highly intuitive for first responders, and also skillfully combines AED function with manual capability so that ACLS-trained clinicians can quickly and easily deliver advanced therapeutic care.

CPR Assistance

LUCAS® Chest Compression System
Designed to provide effective, consistent, and uninterrupted compressions according to AHA Guidelines, LUCAS can be used on adult patients in out-of-hospital and hospital settings.

Information Management

LIFENET® System

The LIFENET System provides EMS and hospital care teams with reliable, quick access to clinical information through a secure, web-based platform, helping to improve patient care flow and operational efficiency.

CODE-STAT™ 9.0 Data Review Software

CODE-STAT 9.0 data review software is a retrospective analysis tool that provides easy access to data, reports, and post-event review.

ReadyLink™ 12-Lead ECG

Handheld, portable, and easy-to-use, the revolutionary ReadyLink 12-Lead ECG quickly and easily captures and transmits 12-lead data to hospitals through the LIFENET System. Doctors can provide chest pain decision support, so teams in the field know exactly what kind of care the patient needs and where to take them.

Support

Physio-Control Service

As the world's leading provider of defibrillation technology, Physio-Control understands our responsibility to maintain the reliability of our lifesaving defibrillator/monitors. We have over 100 field-based technical service representatives worldwide. Physio-Control is committed to service 24/7, and to returning a customer's call within two hours to quickly assess the problem and find the best solution (U.S.). If needed, a technical service representative will be on-site within 24 hours (U.S.).

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, 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 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

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 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 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.

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.

For further information, contact Physio-Control at 800.442.1142 (U.S.), 888.870.0977 (Canada) or visit our website at www.physio-control.com.

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