

**PHYSIO  
CONTROL**



## **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 is designed for the hospital market, and 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.

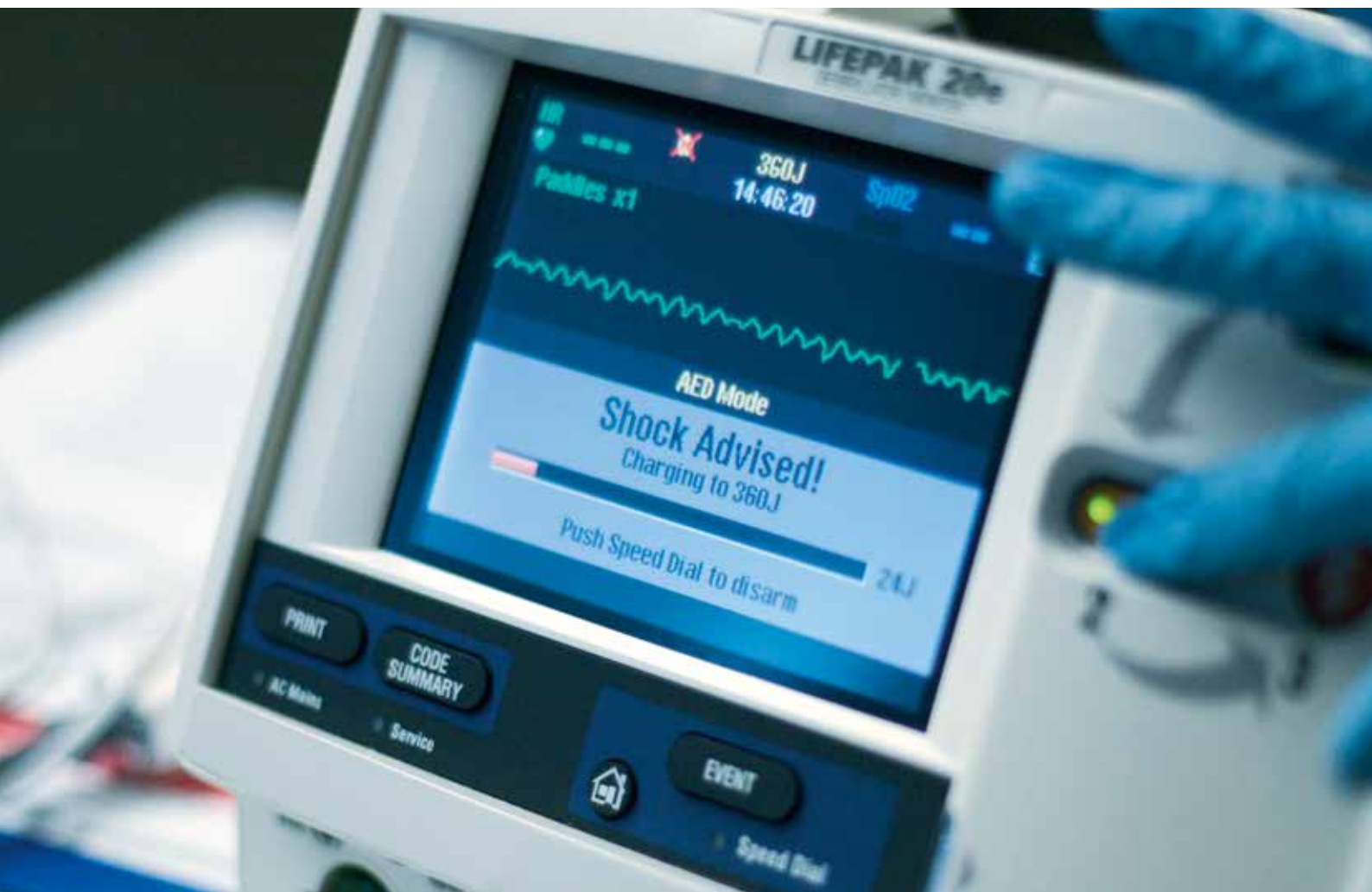


# Trust means being ready

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 flexibility of the 20e also makes it easy to configure to your patient protocols or adapt to recommendations by the American Heart Association and 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.<sup>1,2</sup>

## 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 therapy and 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](http://www.physio-control.com).**



# The Physio-Control family of products

## Monitor/Defibrillators and AEDs

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### **LIFEPAK® 15 Monitor/Defibrillator**

The LIFEPAK 15 monitor/defibrillator is the standard in emergency care for ALS teams who want the most clinically innovative, operationally effective and LIFEPAK TOUGH™ device available today. The 15 offers sophisticated clinical technologies with a rich array of features—like the most powerful escalating energy available (up to 360J), advanced monitoring parameters and a completely upgradable platform.

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### **LIFEPAK® 20e Defibrillator/Monitor with CodeManagement Module®**

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. The CodeManagement Module adds waveform capnography and wireless connectivity to enhance your hospital's ability to effectively manage resuscitations from preparedness through review.

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### **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.

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### **LIFEPAK® CR2 Defibrillator with LIFE LINKcentral™ AED Program Manager**

The LIFEPAK CR2 defibrillator with LIFE LINKcentral AED Program Manager is a complete and connected AED response system that reduces unnecessary delays when an SCA event occurs. And LIFE LINKcentral AED Program Manager continually monitors each AED, automatically sending wireless alerts to ensure readiness. *CE Mark pending.*

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### **LIFEPAK CR® Plus Automated External Defibrillator (AED)**

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.

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### **HeartSine® samaritan PAD 350P HeartSine samaritan PAD 360P**

Durable, affordable and highly portable, the HeartSine samaritan PAD 350P (semi-automatic) and 360P (fully automatic) are simple to use and simple to own AEDs which are well suited for the lay responder.

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### **samaritan® PAD 500P**

More than just an AED, the HeartSine samaritan PAD 500P adds integrated CPR Advisor™ that uses only the electrodes to monitor and uniquely provide visual and verbal feedback on the force and rate of applied CPR. This exclusive technology effectively assists the rescuer to perform CPR—a key link in the chain of survival.

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## Data Solutions



### 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™ Data Review Software

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

## Video Laryngoscope



### McGRATH™ MAC EMS Video Laryngoscope

The McGRATH MAC EMS enables providers to maintain both a direct and indirect view of the patient's airway. Unlike many other video laryngoscopes, the McGRATH MAC EMS doesn't require paramedics to relinquish their direct view in order to incorporate video laryngoscopy.

## CPR Assistance



### LUCAS® 2 Chest Compression System

Provides effective, consistent and uninterrupted compressions according to ERC Guidelines, the LUCAS device can be used on adult patients in out-of-hospital and hospital settings.



### TrueCPR™ Coaching Device

TrueCPR helps your team optimise their manual CPR performance using simple real-time and post-event feedback on the most critical resuscitation parameters. It accurately measures compression depth through proprietary Triaxial Field Induction technology.

## Support



### Physio-Control Service

With a service plan from Physio-Control, you are free to focus on your mission while relying on us to help to ensure the integrity of your lifesaving tools. From emergency repairs to software updates to preventive maintenance, we respond to every service call with speed and expertise so you have the peace of mind to do your job with confidence.

# 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 hard-ware 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 <sub>2</sub> : (minutes):	210	5
Monitoring, plus pacing (at 100 ma, 60 ppm), plus SpO <sub>2</sub> : (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 error is detected

## PHYSICAL CHARACTERISTICS

### Weight:

- Fully featured defibrillator/monitor (pacing, SpO<sub>2</sub> 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)
- For SpO<sub>2</sub> cable and standard re-usable sensor, add: 0.11 kg (0.25lbs)
- For full roll of 50mm paper, add: 0.09kg (0.20lbs)

**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 captures and stores patient data, events (including waveforms and annotations) and continuous ECG waveform records in internal memory.

The user can select and print reports and transfer the stored information.

### Report Types:

- Two format types of CODE SUMMARY critical event record: (short, and medium)
- Initial ECG (except short format)
- Auto vital sign measurements every 5 minutes
- Continuous ECG waveform records (transfer only)

### 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 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<sub>2</sub>

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<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

## 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:**  $\pm 1$  joule or 10% of setting, whichever is greater, into 50 ohms  $\pm 2$  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  $\pm 5\%$  or  $\pm 1$  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)

**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.**

User configurable protocol of three sequential shock levels, each 150–360 Joules

### 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
- Motion Detection: On\* or Off
- Auto Analyze: Off\* or After First Shock

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

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

IEC 60601-2-4/EN 60601-2-4: 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](http://www.physio-control.com)

All claims valid as of October 2012.

## 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.

For further information please contact your local Physio-Control representative or visit our website at [www.physio-control.com](http://www.physio-control.com)



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