

# R Series Defibrillators

Ensuring you are *Code-Ready*.<sup>®</sup>



Simple, Smart and Ready, the ZOLL<sup>®</sup> R Series<sup>®</sup> provides clinicians with comprehensive support for resuscitation. A defibrillator for whatever the need, whoever responds.

**ZOLL**<sup>®</sup>

## Real CPR Help®

Good CPR is critical for effective resuscitation, so feedback to provide better CPR performance is standard on the R Series.

## See-Thru CPR® Technology

ECG signal processing extracts CPR artifact from the ECG so you can see organized rhythms without interrupting compressions.

## Comprehensive Readiness Checks

The R Series® extends testing beyond the basic test shock to check more than 40 individual indicators of readiness. When used with OneStep™ Resuscitation Electrodes, the test is performed automatically every 24 hours.

## OneStep Simplicity

Simple, ingenious solutions that speed operation under the most stressful circumstances.

## Smart Tools

### Clinical Education and Quality

Comprehensive tools support training and operation.

### Technical

New and planned biomedical and asset management software utilities can bring increased efficiency and can help reduce the hidden costs of ownership.

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## R Series Specifications

### Defibrillator

*Waveform:* Rectilinear Biphasic™

*Patient Impedance Range:* 15 to 300 ohms.

*Energy Selections:* 1 to 10, 15, 20, 30, 50, 75, 100, 120, 150 and 200 joules selected using controls on front of the defibrillator or sternum paddles. (Note: When using appropriate pediatric resuscitation electrodes, the 75 joule setting is replaced by 70 and 85 joule settings).

*Smart Step Energy Levels:* Automatically escalates energy through a configured adult or pediatric protocol.

*Energy Display:* Shown on monitor for both selected and delivered.

*Charge Time:* Less than 7 seconds with a new, fully charged battery (first 15 charges to 200 joules); longer charge times may result with a depleted or older battery.

*Synchronized Mode:* Synchronizes defibrillator pulse to patient's R wave. "SYNC" message displayed on monitor and markers shown on both monitor and recorded ECG.

*Charge Controls:* Control from both front of defibrillator or apex paddle.

*Paddles:* External apex/sternum paddles; adult plates slide off to expose pediatric electrode surface.

*Code Readiness Testing:* Verifies defibrillator hardware, therapy delivery cable (with both paddles and electrodes), electrode condition and expiration (with select OneStep Resuscitation Electrodes) without the need for a separate test fixture.

### ECG Monitoring

*Patient Connection:* 3-lead ECG cable, 5-lead ECG cable, paddles or hands-free resuscitation electrodes; selectable by front panel switch.

*Input Protection:* Fully defibrillator protected. Circuits designed to prevent distortion of ECG signal by pacer pulse.

*Implanted Pacemaker Spike Display:* Circuits designed to detect most implanted pacemaker spikes and display a marker on the ECG trace.

*Bandwidth:* 0.5 to 21 Hz (-3dB) standard; 0.05 to 150 Hz diagnostic with configurable options of 0.5 Hz to 40 Hz or 1 Hz to 21 Hz.

*Lead Selection:* I, II, III aVR, aVL, aVF, V, P1, P2, P3 with OneStep Pacing resuscitation electrode.

*ECG Size:* 0.5, 1.0, 1.5, 2.0 or 3.0 cm/mV display on monitor.

*Heart Rate Display:* 0 to 300 bpm ±5%.

*Heart Rate Alarm:* User selectable for tachycardia at 60 to 280 bpm; for bradycardia at 20 to 100 bpm. On/Off status displayed on monitor.

**CE 0197**

Specifications subject to change without notice.

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### Real CPR Help

Activated when OneStep CPR or OneStep Complete resuscitation electrodes are connected.

*Detection Technology:* Accelerometer.

*Compression Depth:* Detected between 0.75 in (1.9cm) and 3.0 in (7.6 cm), with an accuracy of ±0.25 inches (0.6 cm).

*Compression Rate:* Detected between 50 and 150 compressions per minute.

*Feedback:* Configurable audio and visual prompts for rate and depth issued when compressions fall outside of AHA/ERC recommendations.

*CPR Idle Time Display:* Indicates elapsed time since last detected chest compression.

*CPR Index™ (Option):* Integrates compression depth and rate in order to rapidly visualize effort against AHA/ERC recommendations.

*See-Thru CPR Filter (Option):* Removes compression-related artifact from the ECG via an adaptive filtering technique.

### Display

*Screen Type:* Color, VGA liquid crystal display (LCD).

*Screen Size:* 6.5 inches (16.5 cm) diagonally.

*Sweep Speed:* 25 mm/sec.

*Viewing Time:* 5 seconds with standard display format.

*Channels:* 3.

*Information:* Heart Rate, Leads/Pads, Alarm On/Off, Selected Energy, Delivered Energy, User Prompts and Warnings, CodeReadiness test results, SpO<sub>2</sub> (optional), NIBP (optional), EtCO<sub>2</sub> (optional), Pacer functions (optional), Code markers, CPR Index Indicator.

### Battery Packs<sup>1</sup>

*Type:* 10.8 V (nominal) rechargeable lithium ion.

*Capacity:* 5.8 amp hours.

*Weight:* 1.7 lb (0.77 kg).

*Recharge Time:* 5 hours or less with integral charger.

*Operating Time:*<sup>1</sup> >4 hours of continuous ECG monitoring; 100 maximal energy (200J) discharges; 3.5 hours of continuous ECG monitoring and pacing at 60 mA, 80 ppm.

### Recorder

*Technology:* 90 mm thermal array; 80 mm grid width.

*Speed:* 25 mm/sec, 6 second delay.

*Printing Modes:* Manual or automatic.

*Annotations:* Time, date, defibrillation energy, patient impedance, heart rate, pacer output, QRS synchronization marker, ECG size, ECG lead, alarm, defibrillator test results, analyze ECG, ECG bandwidth.

### I/O, Storage, Communications

*Sync In:* 0 to 5 V (TTL Level) pulse, active high, 5 to 15 ms in duration no closer than 200 ms apart; energy transfer begins within 25 ms of the leading edge of the sync in pulse.

*Marker Out:* 0 to 5 V (TTL Level) pulse, active high, 10 ms in duration, the leading edge of the pulse occurs within 35 ms of R wave peak.

*ECG Output:* 1.0 V/cm of deflection on recorder; <25 ms delay from the patient ECG input.

*USB Port (Option):* 2.0 compatible.

*Wireless Communication (Option):* 802.11b, 802.11g compatible.

*Card Slot:* Compact flash compatible.

*Internal Memory:* Disk on chip.

### General

*Size:* 8.2 in (20.8 cm) high x 10.5 in (26.7 cm) wide x 12.5 in (31.7 cm) deep.

*Weight:* 13.6 lbs (6.2 kg) with OneStep Cable and SurePower™ Battery pack; 15.2 lbs (6.9 kg) with paddles.

*Power Sources:* AC Mains: 100 to 120 V AC (50/60 Hz), 220 to 240 V AC (50Hz); Battery: Rechargeable lithium ion battery pack.

*Low Battery Indicator:* A "LOW BATTERY" message appears on the monitor when there is less than 15 minutes of ECG monitoring.

*Design Standards:* Meets or exceeds applicable requirements of UL 60601, AAMI DF80, IEC 60601-2-4, EN 60601-2-25, and 60601-2-27.

*Patient Safety:* All patient connections are electrically isolated.

*Environmental:* Operating Temperature: 0°C to 40°C; Storage and Shipping Temperature: -20°C to 60°C; Humidity: 5% to 95% relative humidity, noncondensing; Vibration: IEC 68-2-6 and IEC 68-2-34; Shock: IEC 68-2-27, 50 g 6mS half-sine; Operating Pressure: 594 to 1060 millibars; Particle and Water Ingress: IEC 529, IP22; Electromagnetic Compatibility (EMC): CISPR 11 Class B Radiated and Conducted Emissions; Electromagnetic Immunity: AAMI DF80, EN 61000-4-3 to 10 V/m; Electrostatic Discharge: AAMI DF80, EN 61000-4-2; Conducted Susceptibility: EN 61000-4-4, 61000-4-5, 61000-4-6.

### External Pacing (Option)

*Type:* VVI demand; asynchronous (fixed rate) when used without ECG leads or in asynchronous (ASYNCR) pacing mode.

*Pulse:* Rectilinear, constant current: 40 ms ±2 ms; variable 0 to 140 mA ±5% or 5 mA, whichever is greater. Rate is variable from 30 to 180 ppm ±1.5%.

*Output Protection:* Fully defibrillator protected and isolated.

*OneStep Pacing:* Eliminates the need to connect separate ECG leads

when used in conjunction with OneStep Pacing and OneStep Complete Resuscitation Electrodes.

### Advisory Defibrillation (Option)

*Shock Advisory Function:* Evaluates ECG rhythm to determine if shock delivery is required.

*Shockable Rhythms:* Ventricular fibrillation with amplitudes >100 µV, and wide-complex ventricular tachycardia with rates >150 bpm for adults or >200 bpm for pediatric applications. Refer to operator's manual for details on sensitivity and specificity performance.

*Protocol Configurations:* Configurable for either CPR or shock-first driven protocols. Energy sequences can be configured for single or multiple shocks with fixed or escalating energy levels. The CPR Interval length is configurable in 1 minute increments up to 4 minutes.

### Pulse Oximetry with Masimo SET® Technology (Option)

*Saturation Range:* 1-100% (%SpO<sub>2</sub>) with a resolution of 1%.

*Pulse Rate Range:* 25-240 ppm with a resolution of 1 ppm.

*Saturation Accuracy:* Non-motion conditions ±2% for adults/pediatrics; ±3% for neonates. During motion ±3% for all patients.

*Pulse Rate Accuracy:* Non-motion conditions ±3ppm. During motion ±5ppm.

### End-tidal CO<sub>2</sub> (Option)

*Transducer Type:* CAPNOSTAT 5™: Mainstream.

*Principle of Operation:* Non-Dispersive Infrared (NDIR) single beam optics, dual wavelength, no moving parts.

*Warm-up Time:* Full specifications within 2 minutes at an ambient temperature of 25°C. Capnogram in 15 seconds.

*Environmental:* Operating Temperature: 0°C to 40°C, Storage and Shipping Temperature: -40°C to 70°C.

### NIBP (Option)

*Patient Population:* Adult, NeoNate, Pediatric.

*Method:* Oscillometric.

*Control:* Automatic and manual measurement.

### WiFi Capable (Option)

*WiFi 802.11b compatibility:* WiFi Compact Flash Card ZOLL P/N: 9214-0203 or Ambicom WL1100C-CF WiFi Card.

*Typical Readiness File:* 750K.

*Typical Code Data File:* 1.2 MB.

1. Values listed for a new battery operating at 20°C.

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