

# ZOLL

## Defibrillator Monitor Pacemaker

# M Series

The Smallest, Lightest, Most Advanced  
Defibrillator Monitor Ever Made



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*It's about time.*

## ZOLL M Series

- Straightforward controls, intuitive menus, and ZOLL's Uniform Operating System make operation simple and reduce staff training requirements.
- High Contrast screen, with improved readability, and wide angle of view (60°), is superior to any LCD display.
- Error Correction minimizes problems during use by providing helpful prompts for corrective action.
- Durable Xtreme Pack™ jacket provides convenient storage for all cables, electrodes, and batteries.
- Full range of models are available from Manual to Advisory and AED to meet all needs and are fully upgradeable to keep pace with changing demands.

### ZOLL Medical Corporation

32 Second Avenue  
Burlington, Massachusetts 01803-4420 U.S.A.  
800-348-9011  
781-229-0020  
781-272-5578 Telefax  
www.zoll.com

### ZOLL Medical European Operations

Dodewaard, the Netherlands  
+31 488 4111 83  
+31 488 4111 87 Telefax  
zolleur@worldonline.nl

### ZOLL Medical U.K. Ltd.

Cheshire, England  
+44 1925 846 400  
+44 1925 846 401 Telefax

### ZOLL Medical Deutschland GmbH

Köln, Germany  
+49 221 398 9340  
+49 221 398 9336 Telefax

### ZOLL Medical the Netherlands

Dodewaard, the Netherlands  
+31 488 4111 83  
+31 488 4111 87 Telefax  
zolleur@worldonline.nl

### ZOLL Medical Canada

Mississauga, Ontario, Canada  
905-629-5005  
905-629-0575 Telefax

### ZOLL Medical France

Paris, France  
+33 1 43 59 2020  
+33 1 43 63 5138 Telefax  
info@zolleur.com

### ZOLL Medical Australia Pty. Ltd

New South Wales, Australia  
+61 2-94208733  
+61 2-94209834 Telefax

### ZOLL Medical Far East Regional Office

New South Wales, Australia  
+612 43 292226  
+612 43 292226 Telefax

### ZOLL Medical Middle East and Africa Region Office

Dubai, United Arab Emirates  
+971 5 065 31504  
+971 4 332 8835 Telefax

### ZOLL Medical Japan

Tokyo, Japan  
+81 3 5768 0788  
+81 3 5768 0788 Telefax

### ZOLL Medical Latin America

Parkland, FL 33067  
954-345-4224  
954-345-2648 Telefax

## All the Capabilities You'll Ever Need

Only 11 lb (5 kg). Half the weight and a third of the size of any unit in its class. The M Series has everything you need for cardiac resuscitation: fast, easy-to-use defibrillation, external pacing, ECG with advanced monitoring, built-in AC or DC power, and an integrated information management system.

### M Series Specifications

#### ECG Monitoring

**Patient Connection:** 3-lead ECG cable, 5-lead ECG cable, 12-Lead ECG cable, paddles or MFE Pads. Selectable by front panel switch.

**Input Protection:** Fully defibrillator protected. Special circuit prevents distortion of ECG by pacemaker pulse. (Pacer version only.)

**Implanted Pacemaker Spike Display:** Dedicated circuitry detects most implanted pacemaker spikes and provides standard display marker of spike on ECG trace.

**Bandwidth:** 0.5-40 Hz (-3 dB) or 0.5-30Hz; 0.05-150 Hz diagnostic.

**Lead Selection:** Displayed on monitor.

**ECG Size:** 0.5, 1, 1.5, 2, 3 cm/mV - display on monitor.

**Heart Rate:** Digital display 0-300 bpm  $\pm$  5%.

**Heart Rate Alarm:** On/Off displayed on monitor.

User-selectable, tachycardia 60-280 bpm, bradycardia 20-100 bpm.

**1 Volt ECG Out:** 1.0 volt/cm of deflection on strip chart recorder. < 25 ms delay from patient ECG input.

**Display Format:** Non-fade moving bar display.

**SmartAlarms™:** Beeper/voice prompts indicate shockable rhythm.

#### Display

**Screen Type:** High-resolution display.

**Screen Size:** 5.6 inches (14.2 cm) diagonally.

**Swipe Speed:** 25 mm/sec.

**Viewing Time:** 4 seconds.

**Channels:** 2.

**Information:** Heart Rate, Lead/Pads, Alarm On/Off, NIBP, 12-Lead ECG, SpO<sub>2</sub>, EtCO<sub>2</sub>, AED Functions and Prompts, Defibrillator Test Function, Self Test Function, Error Corrections and Faults, Pacer Functions (optional), Code Markers, Alarm Selection and Limits, Delivered Energy.

#### Defibrillator

**Waveform:** Damped sinusoid or ZOLL Rectilinear Biphasic.

**Energy Selection:** Selectable at 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 30, 50, 75, 100, 150, 200, 300, 360 joules. (Delivered into 50Ω load.) Selected using controls on sternum paddle or device front panel. Rectilinear Biphasic energy selection up to 200 joules maximum.

**Charge Time:** Less than 7 seconds with a new fully charged battery (first 15 charges to max energy). Depleted batteries will result in a longer defibrillator charge time.

**Energy Display:** Monitor display indicates both selected and delivered energy.



Code Marker System for all drugs and interventions makes charting easy. Information can be printed either on a Summary Report or easily downloaded to a PC using the removable PCMCIA card.



A universal connector for paddles and pads eliminates confusing adaptors and misconnections that can delay life-saving efforts.

**Synchronized Mode:** Synchronizes defibrillator pulse to patient's R-wave. "SYNC" message displayed on monitor. Marker on display and recorder paper identifies R-wave discharge point.

**Advisory Function:** Single analysis or programmable auto re-analyze x3 with programmable auto energy level selection, screen prompts, and voice prompts.

**AED Function:** Auto analyze and charge x3 with programmable auto energy level selection, screen prompts, and voice prompts.

**Charge Controls:** Control on apex paddle and on device front panel.

**Paddles:** External anterior/anterior adult and pediatric. Adult paddles slide off to expose pediatric paddles.

**Multi-Function Electrode (MFE) Pads:** Specifically designed adult anterior/posterior pre-gelled ZOLL MFE Pads, and Multi-Function stat•padz™ packaged in pairs.

**Built-In Defibrillator Tester:** Tests defibrillator energy output and continuity of universal cable and paddles; documented on PCMCIA card and strip chart.

**Defibrillation Advisory:** Evaluates electrode connection and patient ECG to determine if defibrillation is required.

**Shockable Rhythms:** Ventricular fibrillation with amplitude > 100  $\mu$ V and wide complex ventricular tachycardia with rates greater than 150 bpm.

**Multi-Function Electrode Impedance Measurement Range:** 0-250 ohms.

#### Pacemaker (Pacer Version Only)

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

**Pulse:** Rectilinear, constant current; 40 $\pm$ 2 milliseconds; amplitude variable 0 to 140 mA  $\pm$  5% or 5 mA, whichever is greater; digitally displayed on the monitor (increments or decrements by a value of 2 mA); rate variable from 30 to 180 ppm  $\pm$  1.5% (increments or decrements by a value of 2 ppm).

**Output Protection:** Fully defibrillator protected and isolated.

**Multi-Function Electrode (MFE) Pads:** Specifically designed pre-gelled ZOLL stat•padz™, pro-padz™ and pedi-padz™ MFE packaged in pairs.

#### Recorder

**Paper:** 80 mm thermal (grid width). 90 mm (paper width).

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

**Annotations:** Time, date, defib energy, heart rate, pacer output (pacer version only), QRS sync marker, ECG size, lead, alarm, defib test OK/Fail, analyze ECG, analysis halted, noisy ECG, shock advised, no shock advised, ECG too large, ECG too small, and diagnostic bandwidth.

**Printing Method:** High-resolution, thermal array print head.

**Print-out Modes:** Manual or automatic - user-configurable.

**On/Off Control:** Front panel and paddle.

**Automatic Function:** 15-second recording initiated by alarm activation or defibrillator discharge.

#### PCMCIA Card Slots

Accepts two standard series Type II Flash Cards, 1-16 MB; Fax modem card capability in slot 2.

#### PCMCIA Card

Records continuous ECG and device data; optionally records digitally compressed audio data; play on PC with Specified Card Reader and ZOLL Data Control™.

#### Battery Packs

**Type:** Rechargeable, sealed lead acid.

**Recharge Time:** 4 hours or less with integral charger.

**Operating Time:** For a new, fully charged battery pack at 20°C: 35 defibrillator discharges at maximum energy, or 3 hours of continuous ECG monitoring, or 2.5 hours of continuous ECG monitoring/pacing at 60 mA, 80 beats/min. Additional parameters will effect operating time. Consult your operator's guide.

#### General

**Size:** 6.8 in (17.3 cm) high x 10.3 in (26.2 cm) wide x 8.2 in (20.8 cm) deep.

**Weight:** 11.5 lb. (5.23 kg) with Multi-Function Cable and battery; 13.5 lb. (6.14 kg) with paddles.

**Design Standards:** Meets or exceeds UL 2601, AAMI DF-39, AAMI DF-2, and IEC 601-2-4.

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

**Environmental:** Operating Temperature: 0° to 55°C; Storage and Shipping Temperature: -40° to 65°C; Humidity: 5 to 95% relative humidity, non-condensing; Vibration: Mil Std 810E, Minimum Integrity Test; Shock: IEC 68-2-27, 50g 6ms half sine; Operating Pressure: 594 to 1060 mBar; Material Ingress: IEC 529, IP23; Electromagnetic Compatibility (EMC): CISPR; 11 Class B Radiated and Conducted Emissions; Electromagnetic Immunity: AAMI DF-2: IEC 801-3 to 20 V/m; Electrostatic Discharge: AAMI DF-2: IEC 1000-4-2; Conducted Susceptibility: IEC 1000-4-4, 1000-4-5, 1000-4-6.

**AC Power:** Meets all IEC, UL, and AAMI safety requirements.

**Options:** Xtreme Pack I Carry Case  
Xtreme Pack II Durable Rubber Case for added protection.



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Specifications subject to change without notice.

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