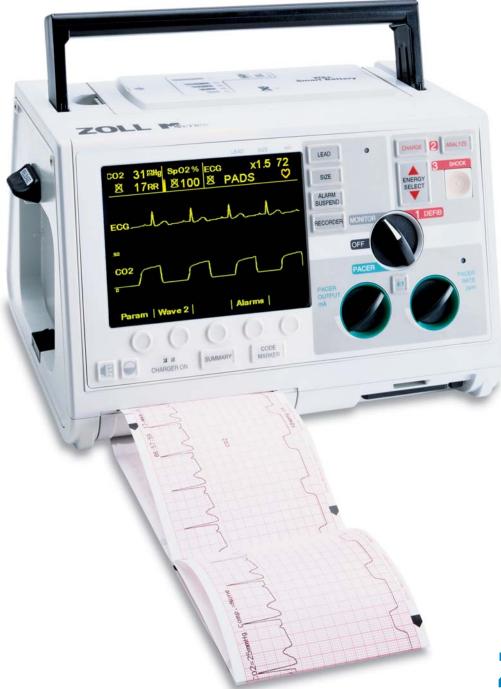
# **ZOLL**

# The Only Defibrillator Monitor Pacemaker with "Plug-and-Play" Mainstream and Sidestream End Tidal CO<sub>2</sub>

M Series with Proven, Reliable Capnography









## **ZOLL M Series EtCO<sub>2</sub>**

- Lifetime warranty on solid-state sensor design.
- Superior technology provides continuous diagnostic information.
- Users can switch easily between Mainstream and Sidestream options since one operating mode covers any intubated and non-intubated patient (neonatal to adult).
- Rapid sensor warm-up provides accurate and timely information.

**ZOLL Medical Corporation** Worldwide Headquarters 269 Mill Road

Chelmsford, MA 01824 978-421-9655

**ZOLL Medical Canada** 

Mississauga, Ontario, Canada 905-629-5005

**ZOLL Medical Latin America** 

Parkland, FL 954-345-4224

**ZOLL Medical U.K.** Cheshire, United Kingdom +44 1925 846 400

**ZOLL Medical France** +33 1 30 05 14 98

**ZOLL Medical Europe** Dodewaard, The Netherlands +31 488 411 183

**ZOLL Medical Germany** 

+49 2236 87870 **ZOLL Medical Austria** 

+43 650 4136222

**ZOLL Medical Middle East and Africa** +30 210 6236691

**ZOLL Medical Russia** +70 95 936 2338

**ZOLL Medical India** 

Mumbai, India +91 22 28322423 **ZOLL Medical China** 

Hong Kong, China +852 3124 5066

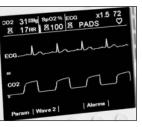
**ZOLL** Medical Japan Yokohama City, Jap +81 45 905 2864

**ZOLL Medical Asia Pacific** +61 418 289733

New South Wales, Australia +61 2 9420 8733

# The Most Choices for EtCO<sub>2</sub> Monitoring

The ZOLL M Series™ with Respironics Novametrix End Tidal CO<sub>2</sub> monitoring is designed for maximum ease of use in pre-hospital and hospital settings. Interchangeable, lightweight Mainstream and Sidestream sensor options allow you to manage and monitor every patient as you see fit.



The M Series provides a constant EtCO<sub>2</sub> readout during monitoring, pacing and defibrillation.



Mainstream or Sidestream for optimal patient care.

#### **M Series Specifications**

#### **ECG Monitoring**

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

Input Protection: Fully defibrillator protected. Special circuit prevents distortion of ECG by pacer 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: 0.5-27 Hz (-3 dB) standard/0.05-150 Hz diagnostic Lead Selection: Displayed on monitor.

ECG Size: 0.5, 1, 1.5, 2, 3 cm/mV — displayed on monitor. Heart Rate: Digital display 0-300 bpm ±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: 5.66 inches (14.4 cm) diagonally Sweep Speed: 25 mm/sec.

Viewing Time: 4 seconds.

Channels: 2

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

#### **Defibrillator**

Waveform: ZOLL Rectilinear Biphasic™

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.

 ${\it Energy \, Display:}\,$  Monitor display indicates both selected and delivered energy.

Multi-Function Electrode (MFE) Pads: Specifically designed pre-gelled ZOLL stat • padz™ Multi-Function Electrodes 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.

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

Energy Selection: Selectable at 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 30, 50, 75, 100, 120, 150, 200 Joules. (Delivered into 50  $\Omega$  load.) Selected using controls on stermum

paddle or device front panel.

Synchronized Mode: Synchronizes defibrillator pulse to patient's Rwave. "SYNC" message displayed on monitor. Marker on display and recorder paper identifies R-wave discharge point. Paddles: External anterior/anterior adult and pediatric Adult paddles slide off to expose pediatric paddles. Charge Controls: Control on apex paddle and on device front panel.

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

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

Charge Controls: Control on device front panel. Energy Selection: Automatic, pre-set shock 1, 2, 3 energy levels — user-configurable. 120, 150, 200 Joules biphasic default. Selected using controls on device front panel.

#### EtCO<sub>2</sub>

Transducer Type: CAPNOSTAT 3®:Mainstream; LoFlo™:Sidestream.

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

Warm-Up Time: Full specifications within 60 seconds, Capnogram in 15 seconds

EtCO2 Measurement Range (at 760 mmHg, ambient temperature of ELO.2 Measurement Kang (at 100 mmHg, ambient temperature of 25°C): 0.100 mmHg (display dependent); 0.13%; 0.12.5kPa. EECO; Accuracy (at 760 mmHg, ambient temperature of 25°C): CAPNOSTAT 3°: 0.40 mmHg ±2 mmHg, 41-70 mmHg ±5%; 71-100 mmHg ±8%. LoFlo<sup>58</sup>: 0.40 mmHg ±2 mmHg, 41-70 mmHg ±5%, 71-100 mmHg ±8%. ±12% for respiration rate above 80 BPM.

EtCO2 Resolution: 1 mmHg 0-100 mmHg.

EtCO2 Stability: Short Term Drift: Drift over four hours shall not exceed 0.8 mmHg maximum. Long Term Drift: Accuracy specification will be maintained over a 20-hour period after zeroing. EtCO2 Noise: RMS noise of the sensor less than or equal to 0.25 mmHg at 7.5% CO2

EtCO<sub>2</sub> Rise Time (10-90%): Mainstream: Less than 60 ms (Adult reusable or single patient use); Less than 50 ms (Infant reusable or single patient use). Sidestream: less than 200 ms.

Respiration Rate (RR) Range: 0-150 breaths per minute (BPM). Respiration Rate (RR) Accuracy: ±1 breath.

Compensations: Barometric pressure 550 -780 mmHg (automatic); Operator selectable  $O_2/N_2O$  compensation. EtCO2 Alarm Limits: User-selectable/High 5 to 100 mmHg,

Low 0 to 95 mmHg/OFF. Respiration Rate (RR) Alarm Limits: User-selectable, High 5 - 150 respirations per minute, Low 0 - 100 respirations per minute/OFF.

per minute/Ori.

Halognated Agents: Specification allows for halogenated anesthetic agents, that may be present at normal clinical levels. The presence of Desthurane in the exhaled breath beyond normal values (5-6%) may positively bias Carbon Dioxide values by up to an additional 2-3 mmHg.

Airway Adapter Deadspace: CAPNOSTAT  $3^{\circ}$ : Adult <5 cc, Infant <1 cc; LoFlo $^{\pi_{\text{N}}}$ : Adult 7.3 cc maximum Pediatric/Infant <1 cc

#### Environmental:

Operating Temperature: 10° to 40°C

Storage and Shipping Temperature: -10° to 55° C. The M Series unit may not perform to specifications when stored at the upper or lower extreme limits of storage temperature and immediately put

#### 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 milliseconds ±2%; amplitude variable 0 to 140 mA ±5% or 5 mA, whichever is arpintate variable to 0.7 for min = 2.5 or for min, which core greater, digitally displayed on the monitor (increments or decrements by a value of 2 mA); rate variable from 30 to 180 ppm ±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\*\* Multi-Function Electrodes packaged in pairs.

#### Recorder

Paper: 80 mm thermal (grid width). 90 mm (paper width). Speed: 25 mm/sec., 6-second delay.

Amotations: Time, date, delb nengy, heart rate, pacer output (pacer version only), QRS sync marker; ECG size, lead, alarm, delb test OKFail, analyze ECG, pads off, 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. Printout 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.

#### Voice Prompts

"Attach pads," "Check patient," "Stand clear," "Press shock," "No shock advised," "Check pulse," "Press analyze," "If no pulse, perform CPR."

#### Visual Prompts

"Analyze," "Shock adv," "No shock adv," "Joules selected," "Charging," "Press shock," "Check patient," "If no pulse do CPR."

#### **PCMCIA Card Slots**

Accepts two standard series Type II Flash Cards, 2, 4, and 16 MB: Fax modem card capability in slot  $1\,$ 

#### **PCMCIA Card**

Records continuous ECG and device data; optionally records digitally compressed audio data (AED versions only); play on PC with Specified Card Reader and RescueNet Code Review

### **Battery Packs**

Type: Rechargeable, sealed lead acid.

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

Operating Time: (ECCO<sub>2</sub> and SpO<sub>2</sub> Options): For a new, fully charged PD 4+10 battery pack at 20°C: 35 defibrillator discharges at maximum energy (200 J), or 1.5 hours minimum of continuous ECG monitoring pacing at 60 mÅ, 70 beats/min. For a new, fully charged XL battery pack at 20°C: 60 defibrillator discharges at maximum energy (200 J), or 3.0 hours minimum of continuous ECG monitoring, or 2.75 hours of continuous ECG monitoring/pacing at 60 mÅ, 70 beats/min.

Additional parameters will affect operating time. Consult your

#### General

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

Weight: 11.5 lb. (5.23 kg) with Universal 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.

Patient Softey: All patient connections are electrically isolated.

Environmental: Operating Humidity: 5 to 95% relative humidity.

Test; Shock: IEC 68-2-27, 50 g 6 mS half sine; Operating
Pressure: 594 to 1060 mBar; Material Ingress: IEC 529, IP24;
Electromagnetic Compatibility (EMC): CISPR; 11 Class B
Radiated and Conducted Emissions; STET Immunity: AAMI
OF-39, IEC 60601-1-2 to 15 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.





Specifications subject to change without notice. M Series, Rectilinear Biphasic, RescueNet Code Review, SmartAlarms, stat-padz, and Xtreme Pack are trademarks of ZOLL Medical Corporation. Capnostat and LoFlo are registered trademarks of Respironics Novametrix. © ZOLL Medical Corporation 2004. All rights reserved. 9656-0125 Printed in USA 20M 12/04