Mindray ePM 12M Vet

Veterinary Monitor

Intelligence for safety

As veterinary medicine advances, the demand for high-quality veterinary equipment increases. The Mindray ePM 12M Vet focuses on progressive design, making this monitor smart and simple.

ePM 12M Vet supports advanced parameters with excellent and accurate performance. Innovative CrozFusion technology can provide continuous and stable performance during environmental interference.

Precise Algorithms

- NIBP: Veterinary-specific; weak-signal tolerant and anti-interference algorithm
- ECG: Multi-lead analysis algorithm, a patented Mindray Exclusive
- SpO_2: Low perfusion and anti-motion algorithm

Comprehensive Parameter Monitoring

- Innovative design of lifting handle and flexible expansion
- Supports advanced parameters: CO_2, 4-IBP, C.O., AG, O_2
- CO_2: Artema technology, with 30 years of technical expertise

CrozFusion™

Joint analysis of ECG、SpO_2 signals guarantees stable and accurate performance during periods of poor contact or electrical interference. Reduces false arrythmia alarms and alleviates alarm fatigue.

SPECIFICATIONS

Weight:
10.58 lbs (4.8 kg)
[Standard configuration, excluding modules, recorder, battery and accessories.]

Dimensions:
12.2” x 11.4” x 6.7”
(310 x 289 x 169 mm)

Display Size:
12.1-inch,
1280 x 800 pixels

Display Type:
Capacitive screen,
support multi-touch operation

Display Channel:
Up to 10 waveform channels

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www.avantevet.com

Avante Animal Health

ECG

Meet standards of IEC 60601-2-27 and IEC 60601-2-25

Lead set	3-lead: I, II, III 5-lead: I, II, III, aVR, aVL, aVF, V ** 6-lead: I, II, III, aVR, aVL, aVF, Va, Vb 12-lead: I, II, III, aVR, aVL, aVF, V1 to V6 Automatic 3/5/6/12 - lead recognition
Input Signal Range	± 10mV(p-p)
Electrode offset potential tolerance ± 800 mV	
Sweep speed	6.25 mm/s, 12.5 mm/s, 25 mm/s, 50 mm/s
Gain	x 0.125, x 0.25, x0.5, x 1, x2, x4, auto
Waveform format	Standard, Cabrera
Bandwidth	Diagnostic mode: 0.05 to 150 Hz Monitor mode: 0.5 to 40 Hz Surgical mode: 1 to 20 Hz ST mode: 0.05 to 40 Hz
CMRR	Diagnostic mode:> 90 dB Monitor, Surgical, ST mode: > 105 dB
Pace Detection	Amplitude: ± 2 mV to± 700 mV Width: 0.1 to 2 ms Rise ti me: 10 to 100 µs
Defib. protection	Withstand 5000V (360J) defibrillation
Recovery time	<5 s

Provides Glasgow resting 12-lead ECG algorithm.

Arrhythmia Analysis

Intended use for Canine, Feline and Others.
Multi-lead, 25 classifications. Asystole, VFib/VTac, Vtac, Vent. Brady, Extreme Tachy, Extreme Brady, Vrhythm, PVCs/min, Pauses/min, Couplet, Bigeminy, Trigeminy, R on T, Run PVCs, PVC, Tachy, Brady, Missed Beats, PNP, PNC, Multif. PVC, Nonsus. Vtac, Pause, Irr. Rhythm., Afib.

ST Segment Analysis

Intended use for Canine, Feline and Others

ST range	- 2.5 to+ 2.5 mV
ST accuracy	± 0.02 mV or ± 10%, whichever is greater (- 0.8 to+ 0.8 mV)
ST resolution	0.01 mV

QT Analysis

Intended use for Canine, Feline and Others

Parameters	QT, QTc, aQTc
QTc formula	Bazett, Fridericia, Framingham, or Hodges
QT/QTc range	200 to 800 ms
QT accuracy	±30ms
QT resolution	4ms
QTc resolution	1ms
QT-HR range	15 to 180 bpm

Heart Rate

HR rang	15 to 350 bpm
HR accuracy	± 1 bpm or ± 1%, whichever is greater.
HR resolution	1 bpm

Respiration

Lead	I or II, auto
RR range	0 to 200 rpm
RR accuracy	± 1 rpm(0 to 120 rpm) ± 2 rpm (121 to 200 rpm)
RR resolution	1 rpm
Sweep speed	3 mm/s, 6.25 mm/s, 12.5 mm/s, 25 mm/s, 50mm/s
Apnea time	10 15 20 25 30 35 40s

SpO2

Meet standards of ISO 80601-2-61.

Module	Masimo, Nellcor
Range	0 to 100%
Resolution	1%
Accuracy	
Nellcor:	± 3% (70 to 100%) Unspecified (0 to 69%)
Masimo:	± 3 % (70 to 100%, non-motion) ± 3 % (70 to 100%, motion) Unspecified (1 to 69%)
Perfusion indicator (PI)	Yes, for Masimo SpO2
Pitch Tone	Yes
PR Refresh Rate	1 sec

PR

PR range	20 to 300 bpm (from Nellcor SpO2) 25 to 240 bpm (from MasimoSpO2) 20 to 350 bpm (from IBP) 30 to 300 bpm (from NIBP)
PR accuracy	± 3 bpm (20 to 250 bpm, from Nellcor SpO2) ± 3 bpm (non-motion, from Masimo SpO2) ± 5 bpm (motion, from Masimo SpO2) ±1 bpm or ±1 %, whichever is greater (from IBP) ± 3 bpm or ±3 %, whichever is greater (from NIBP)
Refreshing rate	≤ 1 s

Temperature

Meet standard of ISO 80601-2-56.

Technique	Thermal resistance
Channels	2 channels
Temp range	0 to 50 °C (32 to 122 °F)
Temp accuracy	± 0.1 °C or± 0.2 °F (without probe)
Temp resolution	0.1 °C
Refreshing rate	≤ 1 s

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NIBP

Meet standards of ISO 80601-2-30.

Technique	Oscillometry
Operation mode	Manual, Auto, STAT, SequenceSystolic,
Parameters	diastolic, mean
Max measurementtime	120 s
Systolic range	Weight > 23kg: 25-290mmHg
	23kg > Weight > 10kg: 25-240mmHg,
	10kg > Weight: 25-240mmHg
Diastolic range	Weight > 23kg: 10 to 250mmHg
	23kg > Weight > 10kg: 10 to 200mmHg,
	10kg > Weight: 10 to 200mmHg
Mean range	Weight > 23kg: 15 to 260mmHg
	23kg > Weight > 10kg: 15 to 215mmHg,
	10kg > Weight: 15 to 215mmHg
NIBP accuracy	Max mean error: ± 5 mmHg
	Max standard deviation: 8 mmHg
NIBP resolution	1 mmHg

Assisting venous puncture: Yes

IBP

Meet standard of IEC 60601-2-34.

Channels	Up to 4 channels
Sensitivity	5 μV/V/mmHg
Impedance range	300 to 30000
IBP range	-50 to 360 mmHg
IBP accuracy	±1 mmHg or ±2 %, whichever is greater
IBP resolution	1 mmHg
PPVrange	0 to 50%
PAWP	Yes.

ICP measurementSupport

Support waveforms overlapping

C.O.

Technique	Thermodilution
C.O.range	0.1 to 20 L/min
C.O. accuracy	±0.1 L/min or ±5%, whichever is greater
C.O. resolution	0.1 L/min
TB range	23 to 43 °C
TI range	0 to 27°C
TB,TI accuracy	± 0.1 °C (without sensor)
TB, TI resolution	0.1 °C

Artema Sidestream CO2

Meet standard of ISO 80601-2-55.

**Options: Paramagnetic 02 sensor

CO2 sample flow rate

120 ml/min (DRYLINE II TM watertrap for Large animal)

90/70 ml/min (DRYLINE II TM watertrap for Small animal)

CO2 sample flow rate accuracy

±15 ml/min or ±15 %, whichever is greater

CO2 Response time	:5 5.0 s@ 120ml/min (for Large animal)
	:54.5 s@ 90 ml/min (for Small animal)
	:5 5.0 s@ 70 ml/min (for Small animal)
O2 Response time	:5 5.0 s@ 120 ml/min
	:5 4.5 s@ 90ml/min
Sweep speed	3 mm/s, 6.25 mm/s, 12.5 mm/s, 25 mm/s,
	50mm/s
CO2 range	0to150mmHg
CO2 accuracy	Full accuracy mode:
	0 - 40 mmHg: ± 2 mmHg
	41 - 76 mmHg: ± 5% of reading
	77 - 150 mmHg: ± 10% of reading
	ISO accuracy mode:
	Add ± 2 mmHg to the full accuracy mode
CO2 resolution	1 mmHg
O2 range	0 to 100%
O2 accuracy	±1% (0 to 25%)
	±2% (25.1 to 80%)
	±3% (80.1 to 100%)
O2 resolution	0.1 %
awRR range	Oto 150 rpm
awRR accuracy	± 1 rpm (0 to 60 rpm)
	± 2 rpm (61 to 150 rpm)
Apnea time	10 15 20 25 30 35 40s

Oridion Microstream CO2

Meet standard of ISO 80601-2-55.

Sample flow rate	50 - $^{7\cdot5}$+1s ml/min
Initialization time	30 s (typical)
Response time	2.9 s (typical)
Sweep speed	3 mm/s, 6.25 mm/s, 12.5 mm/s, 25 mm/s,
	50mm/s
CO2 range	Oto 150 mmHg
CO2 accuracy	±2 mmHg (0 to 38 mmHg)
	±5 % of the reading (0.08 % increased in error
	for every 1 mmHg if the reading is more than
	38mmHg) (39 to 99 mmHg)
awRR range	Oto 150 rpm
awRR accuracy	±1 rpm (0 to 70 rpm)
	±2 rpm (71 to 120 rpm)
	±3 rpm (121 to 150 rpm)
Apnea time	10 15 20 25 30 35 40s

Multi-gas

Meet standard of ISO 80601-2-55.

Technique	Infrared absorption, paramagnetic
Gas	properties for 02 monitoring
Warm-up time	CO2, 02, N2O, Des, Iso, Enf, Hal, Sev
	ISO accuracy mode: 45 s
	Full accuracy mode: 10 min

Sample flow rate (with DRYLINE II TM watertrap)

Large animal: 200 ml/min

Small animal: 120 ml/min

Sample flow rate accuracy ±10 ml/min or ±10%, whichever is greater.

Delay time	< 4 s
Response time	DRYLINE II TM watertrap for Large animal,
	200 ml/min:
	CO2: ≤ 4.2s
	N2O: :54.3s
	Enf/Iso/Hal/Sev/Des::5 4.5 s

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	O2: :545
	DRYLINE II TM watertrap for Small animal, 120 ml/min:
	CO2: ≤ 4s
	N2O: :54.2s
	02: :545
	Enf/Iso/Hal/Sev/Des::5 4.4 s
CO2 range	0 to 30%
CO2 accuracy	±0.10/oABS (Oto 1%)
	±0.20/oABS (1 to 5%)
	±0.30/oABS (5 to 7%)
	±0.50/oABS (7 to 10%)
O2 range	Oto 100%
O2 accuracy	±10/oABS (Oto 250/oREL)
	±20/oABS (25 to 800/oREL)
	±30/oABS (80 to 1000/oREL)
N2O range	Oto 100%
N2O accuracy	±20/oABS (0 to 200/oREL)
	±30/oABS (20 to 1000/oREL)
Enf/Iso/Hal/Sev/Des range	Oto 30 %
awRR range	2 to 100 rpm
awRR accuracy	±1 rpm (2 to 60 rpm)
Apnea time	10s, 15 s, 20 s, 25 s, 30 s, 35 s, 40 s

Provide MAC value (support calibrated by age).
Support two mixed gas identify and monitoring.

Data Review

For 2G storage	
Trends data	Up to 120 hours@ 1min
Events	Up to 1000 events, including parameter alarms, arrhythmia events technical alarms, and so on.
NIBP	Up to 1000 sets
Full disclosure	48 hours at Maximum. The specific storage time depends on the waveforms stored and the number of stored waveforms.
For 16G storage	
Trends data	Up to 240 hours@ 1min, 2400 hours@10 min
Events	Up to 2000 events, including parameter alarms, arrhythmia events technical alarms, and so on.
NIBP	Up to 3000 sets
Full disclosure	48 hours for all parameter waveforms.
For 2G &16G storage	
Interpretation of resting	20 sets of 12-lead ECG results
OxyCRG	400 OxyCRG events
ST review	Up to 120 hours @ 1min
Minitrend	Yes

Alarms

Audible indicator	Yes, 3 different alarm tones, and prompt tone
Visible indicator	Red/yellow/cyan LED, and alarm message display

Provide AlarmSight infographic alarm indicator

Special Functions

Clinical Assistive Application (CAA): ST Graphic™, NIBP analysis. Calculations (Drug, Hemodynamic, Oxygenation, Ventilation, Renal), and Titration table.

Wi-Fi Communications

Protocol	IEEE 802.11a/b/g/n
Modulation mode	DSSS and OFDM
Operating frequency	IEEE 802.11b/g/n (2.4G):
	ETSI/FCC/KC: 2.4 to 2.483 GHz
	MIC: 2.4 to 2.495 GHz
	IEEE 802.11a/n (5G):
	ETSI: 5.15 to 5.35 GHz, 5.47 to 5.725 GHz
	FCC: 5.15 to 5.35 GHz, 5.725 to 5.82 GHz
	MIC: 5.15 to 5.35 GHz
	KC: 5.15 to 5.35 GHz, 5.47 to 5.725 GHz, 5.725 to 5.82 GHz
Channel spacing	5 MHz@ 2.4 GHz, 20 MHz@ 5 GHz
Wireless baud rate	IEEE 802.11a: 6 to 54 Mbps
	IEEE 802.11b: 1 to 11 Mbps
	IEEE 802.11g: 6 to 54 Mbps
	IEEE 802.11n: 6.5 to 72.2 Mbps
Output power	< 20dBm (CE requirement: detection mode-RMS)
	< 30dBm (FCC requirement: detection mode- peak power)
Operating mode	Infrastructure
Data security	WPA-PSK, WPA2-PSK, WPA-Enterprise, WPA2-Enterprise (EAP-FAST. EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP-MSCHAPv2, PEAP-TLS, LEAP)
	Encryption: TKIP and AES

Interfacing

Main unit	AC power connector (1)
	VGA port (1)
	Network connector (1), RJ45
	USB 2.0 connector (2)
	Analog output/nurse call/defib. Sync. Port (1)
	Integrated module rack (1), for 2 slots
Barcode scanner	Support 1D and 2D barcode
Remote control	Support
Thermal recorder	3 traces (paper 50 mm width, 20 m length)
Network printer	Support

Power

Line voltage	100 to 240VAC (±10 %)
Maximum current	2.0A
Frequency	50/60 Hz (±3 Hz)
Battery	Rechargeable lithium-ion battery, 2600mAh/4500mAh
	Rechargeable smart lithium-ion battery 5600mAh

	>2 hours run time (2600mAh)
	>4 hours run time (4500mAh)
	>4.5 hours run time (5600mAh xl)
	>9 hours run time (5600mAh x2)
Recharge time (power off)	
	2.5 hours to 90%(2600mAh)
	5 hours to 90% (4500mAh)
	5 hours to 90% (5600mAh xl)
	10 hours to 90% (5600mAh x2)

Environmental Requirements

Temperature	Operating: 0 to 40 °C (without AG), 10 to 40 °C (with AG) Storage: -20 to 60 °C
Humidity	Operating: 15 to 95 % (non condensing) Storage: 10 to 95 % (non condensing)
Barometric	Operating: 427.5 to 805.5 mmHg (57.0 to 107.4 kPa) Storage: 120 to 805.5 mmHg (16.0 to 107.4 kPa)

Some of functions marked with an asterisk may not be available. Please contact your Avante Animal Health sales representative for the most current information.

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