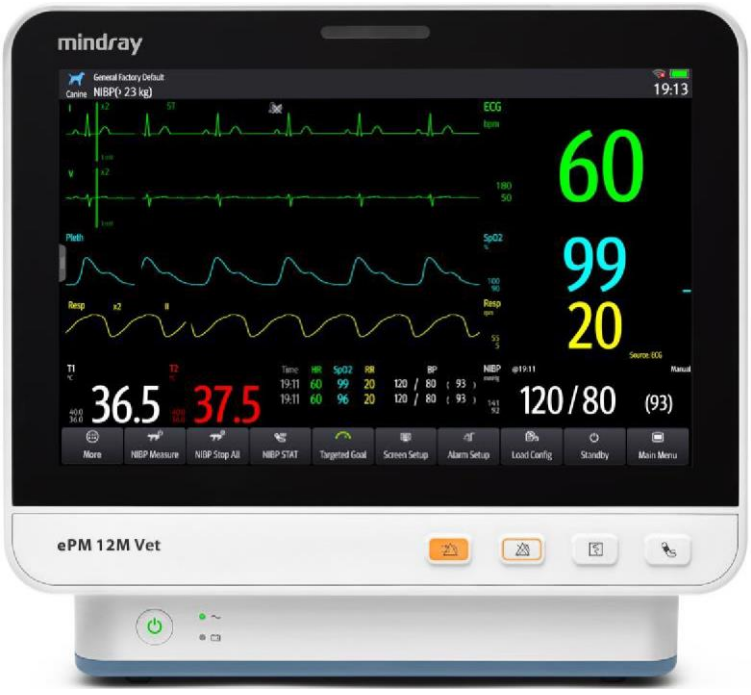
ePM 12MVet

Veterinary Monitor

Data Sheet



Physical Specifications

Weight	4.8 kg (Standard configuration, excluding modules, recorder, battery and accessories.)
Size	310 x289 x169mm
Display screen	Capacitive screen, support multi-touch operation. 12.1-inch, 1280 x 800 pixels
Display channel	Up to 10 waveform channels

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.

Heart Rate

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

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	1 ms
QT-HR range	15to 180 bpm

Respiration

Lead	I or II, auto
RR range	0to200 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 Masimo SpO2) 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

NIBP

Meet standards of ISO 80601-2-30.

Technique	Oscillometry
Operation mode	Manual, Auto, STAT, Sequence Systolic,
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 250 mmHg 23kg>Weight>10kg: 10 to 200 mmHg 10kg>Weight: 10 to 200 mmHg
Mean range	Weight>23kg: 15 to 260 mmHg 23kg>Weight>10kg: 15 to 215 mmHg 10kg>Weight: 15 to215 mmHg
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	300to 30000
IBP range	-50 to 360 mmHg

IBP accuracy ±1 mmHg or ±2 %, whichever is greater
IBP resolution 1 mmHg
PPVrange 0to50%
PAWP Yes.
ICP measurementSupport
Support waveforms overlapping.

C.O.

Technique Thermodilution
CO.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 to43 °C
Tl range 0to27°C
TB, Tl accuracy ± 0.1 °C (without sensor)
TB, Tl 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)
02 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
02 range 0to100%
02 accuracy ±1%(0to25%)
±2%(25.1 to 80 %)
±3 % (80.1 to 100 %)
02 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 -7.5+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

Capnostat Mainstream CO2

Meet standard of ISO 80601-2-55.
Rise time <60ms
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 40 mmHg)
±5 % ofthe reading (41 to 70 mmHg)
±8 % of the reading (71 to 100 mmHg)
±10 % of the reading (101 to 150 mmHg)
awRR range Oto 150 rpm
awRR accuracy ±1 rpm

Multi-gas

Meet standard of ISO 80601-2-55.
Technique Infrared absorption, paramagnetic properties for 02 monitoring
Gas CO2, 02, N2O, Des, lso, Enf, Hal, Sev
Warm-up time 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/lso/Hal/Sev/Des::5 4.5 s
02: :545
DRYLINE II TM watertrap for Small animal, 120 ml/min:
CO2: ≤ 4s
N2O: :54.2s
02: :545
Enf/lso/Hal/Sev/Des::5 4.4 s
CO2 range 0to30%
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%)
02 range Oto 100%
02 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/lso/Hal/Sev/Des range Oto 30 %
awRR range 2 to 100 rpm
awRR accuracy ±1 rpm (2 to 60 rpm)
Apnea time 10 s, 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	Upto120hours@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 240 VAC (±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: Oto 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 local Mindray Animal sales representative for the most current information.

www.mindray.com

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