

Vitalmax 4000 Modular

Pace Tech, Inc.
510 Garden Avenue North, Clearwater, FL 33755
Phone: (727) 442-8118 Fax: (727) 443-7257

Vitalmax 4000 Modular Product Specifications

A. Mechanical Description

| | |
|--------|---|
| Size | 13.3" H x 10" W x 13.5"D (33.25 cm x 25 cm x 33.75 cm) |
| Weight | 24 lb 8.5 oz (11.29 kg) |
| Color | Beige and Aqua |

B. Power Requirements

| | |
|------------------------|---|
| Operation | AC/DC |
| Internal battery | 12V 7.0Ahr sealed lead-acid |
| Battery operating time | 3 - 3.5 hours full charge |
| Battery charge time | 16-20 hours |
| AC mains input | Universal Switching Power Supply, Hospital grade plug, 100-250 V/50-60 Hz 16VDC / 2.8A Output, UL, CSA, GS |
| Fuses | Two 5.0 A, 250 V, fast blow |

C. Performance Specifications

1. ECG

| | |
|---|--|
| CMRR | 100 dB @60 Hz (common mode rejection ratio) |
| Heart rate range | 30-240 bpm |
| Heart rate averaging | 4 beat average |
| Heart rate accuracy | ±5 bpm or 10%, whichever is greater |
| Response time of heart rate meter for a step change in heart rate | 80-40 bpm less than 7 seconds. 80-120 bpm less than 11 seconds. |
| Pacemaker pulse rejection | Amp: ± 2 mV to ± 700 mV Duration: 0.1 ms to 2.0 ms |
| Input | 3-Lead ECG / Respiration patient cable with no series resistance |
| Connector | AAMI 6-pin |
| Lead selection | I, II, III (Standard Config.) |
| ECG reference signal | 1 mV software triggered |
| Patient isolation | Breakdown voltage: >5000 VRMS 60 seconds 60 Hz |
| Leakage current | |
| a) Internal to ground | < 0.01 mA (< 10 uA) |
| b) Enclosure | < 0.01 mA (< 10 uA) |
| c) Leads-off sensing current | < 10 uA |
| DC current | < 0.01 mA (< 10 uA) |
| Frequency response/Bandwidth | 0.5-40 Hz (±3 dB) |
| Patient drive current | < 10 uA |
| Maximum T wave rejection capability | 120% of QRS Segment |
| Defibrillator & ESIS protected | Tested with 5 kV |
| Recovery time following defibrillation | Within 8 seconds. |
| Lead fault alarm | Audible, visual |
| QRS indicator | Audible: user volume control |
| Asystole: | Audible and visual |
| Gain selection | 5 mV, 2 mV, 1 mV, 0.5 mV, 0.1 mV |
| Time to alarm tachycardia | <3 seconds |
| Aspect ratio | 0.24, 0.4, 0.6, ±0.08 sec/mV |
| Alarm frequency | Low alarm 2.0 – 2.4 Hz High alarm 3.0 – 3.4 kHz |
| ECG input impedance | >2.5 M Ohm @ 10 Hz |
| ST Analysis Range | ± 2.0 mV |
| Arrhythmia Analysis | PVCs per minute, VF, VTACH, RUN, R ON T, Couplet, Bigeminy, Trigeminy, PVC, TACH, BRAD, Drop, ASYSTOLE |

Vitalmax 4000 Modular Product Specifications

2. ECG/ Thoracic Impedance Respiration

| | |
|---------------------------------------|--|
| Excitation current | <100 uA |
| Excitation frequency | 65 kHz |
| Maximum allowable electrode impedance | 2 K ohm |
| Size adjustment | User selectable |
| Respiration rate range | 4-99 rpm (respirations per minute) |
| Respiration rate accuracy | ± 2 rpm |
| Respiration rate averaging | 4 breath average |
| Respiration alarm limits | Upper 4-99 rpm Lower 4-98 rpm |
| Sensitivity range | Adult: 0.3-10 Ohms Neonate: 0.1-10 Ohms |
| Apnea | Audible and visual alarm in less than 20 seconds. Not recommended for apnea monitoring. |
| Sensing electrodes | RA and LA |
| Lead Selection | I, II, III |

3. END-TIDAL CO₂, inCO₂(min) and RESPIRATION

| | |
|-----------------------------|---|
| Type | Side stream, non-dispersive infrared |
| Method | CO ₂ sample line with nasal cannula or endotracheal tube |
| connector | |
| CO ₂ averaging | 4 breaths or breath-to-breath |
| CO ₂ range | 0-99 mmHg adult/pediatric (0-13.2 kPa) |
| CO ₂ accuracy | ± 2 mmHg (0-40 mmHg)[± 0.27 kPa (0-5.33 kPa)] ± 5% of reading [(40-99 mmHg)(5.33-13.2 kPa)] |
| Rise time | < 300 ms 10% to 90% Co ₂ |
| CO ₂ calibration | Manual with room air, and 10% CO ₂ every six months |
| Sample aspiration rate | 75 ml/min ±10 ml |
| Sample line purging | Automatic |
| Water trap | Disposable, Volume 4 cc |
| Respiration range | 4-99 rpm (respirations per minute) adult/pediatric |
| Respiration rate accuracy | ± 2 rpm |
| Analog output | Optional |
| Alarm limits | Respiration Upper 4-99 rpm Lower 4-98 rpm ETCO ₂ Upper 0-99 mmHg (13.2 kPa) Lower 0-98 mmHg InCO ₂ Upper 0-99 mmHg (0-13.2 kPa) Lower 0-98 mmHg |
| Alarm volume | Fixed |

4. INVASIVE PRESSURE

| | |
|---|---|
| Channels | Two |
| Measurement range | -30 mmHg to +300 mmHg (-4.0 kPa to 40.0 kPa) |
| Waveform Span | Adjustable to 30, 60, 90, 120, 180 or 300mmHg |
| Pressure offset | Adjustable in steps of 10 mmHg |
| Gain accuracy | ± 1% or ± 2 mmHg whichever is greater (± 0.27 kPa) |
| Analysis value | Maximum, minimum, and mean pressure Pulse rate from arterial waveforms |
| Heart rate range | 10-250 bpm |
| Heart rate accuracy | ± 1% or ± 5 bpm, whichever is greater |
| Heart rate alarm limits | Upper 0-250 bpm Lower 0-249 bpm |
| Transducer sensitivity | 5 uV/V/mmHg |
| Transducer excitation | 5V DC |
| Transducer zero adjust | ± 150 mmHg (± 19.99 kPa) |
| Transducer auto-zeroed on pressing the zero-adjust button | |

Vitalmax 4000 Modular Product Specifications

| | |
|---|---|
| Bandwidth | Upper band limit: Factory selectable: 8, 9, 10, 12, 14, 16, 19, 22, 25, 30, 35, 40, |
| Hz | Default: 14 Hz |
| Display | Lower band limit: DC Digital waveform display with semiautomatic and manual pressure range scaling Trend display of pressure waveforms |
| Alarms | Audio and Visual User adjustable upper and lower alarm limits |
| User selectable pressure channel labels | IP1(2), ART1(2), AO1(2), RA1(2), FA 1(2), CVP1(2), PA1(2) |
| Alarm limits | Max IP (Systolic): Upper -30 to 300 mmHg (-4.0 to 40 kPa) Lower -30 to 299 mmHg (-4.0 to 39.9kPa) Min IP (Diastolic): Upper -30 to 300 mmHg (-4.0 to 40 kPa) Lower -30 to 299 mmHg (-4.0 to 39.9kPa) Mean IP Upper -30 to 300 mmHg (-4.0 to 40 kPa) Lower -30 to 299 mmHg (-4.0 to 39.9kPa) |

5. PULSE OXIMETRY (SpO2)

| | |
|-------------------------|---|
| Saturation range | 0-100%, adult/pediatric/neonate |
| Saturation averaging | 8 beat average |
| Saturation accuracy | ± 2% (70-100%), ±3% (50-69%), (0-49% unspecified) |
| Saturation alarm limits | Upper: 0-100% Lower: 0-99% |
| Pulse rate range | 30 - 254 |
| Pulse rate averaging | 8 second average |
| Pulse rate accuracy | ±2% @ 30-100 bpm |
| Pulse alarm limits | Upper: 0-250 bpm Lower: 0-249 bpm |
| Pulse tone | Pitch adjusts to SpO2 value Volume adjustable |
| Pulse rate display | Waveform, digital, pulse amplitude |
| Sensor types | Finger, Universal "Y", ear lobe clip Disposable and reusable wrap probes |

6. NON-INVASIVE BLOOD PRESSURE (NIBP)

| | |
|-------------------------|---|
| Method | Automatic oscillometric |
| Parameters measured | Systolic, diastolic, mean arterial pressure, pulse |
| Scale | mmHg or kPa |
| Operating modes | Manual, Automatic, Stat |
| Repeat cycles | 10-50 seconds; 1-99 minutes |
| Rapid cycle update | 1-4 minutes (STAT mode) |
| Measurement range | Systolic: Adult/pediatric 30-250 mmHg (4.0-33.3 kPa) Neonate 20-160 mmHg (2.7-21.3 kPa) Diastolic: Adult/pediatric 10-180 mmHg (1.3-24.0 kPa) Neonate 10-140 mmHg (1.3-18.7 kPa) |
| Measurement time | Typical 50 seconds Maximum 120 seconds Typical Stat 30 seconds |
| Cuff inflation rate | Not greater than 40-50 mmHg/sec (5.33-6.66 kPa/sec) |
| Cuff inflation pressure | 30 mmHg above last systolic (4.0 kPa) |
| Cuff pressure range | Adult/pediatric 0-250 mmHg (0-33.3 kPa) Neonate 0-140 mmHg (0-18.7 kPa) |
| Initial cuff inflation | Adult/pediatric 170 ± 10 mmHg (22.7 ± 1.3 kPa) Neonate 120 ± 10 mmHg (16.0 ± 1.3 kPa) |
| Auto deflate pressure | Adult/pediatric 280 mmHg; ± 5 mmHg (36.7-38.0 kPa) Neonate 235 mmHg; ± 5 mmHg (30.7-32.0 kPa) |
| NIBP display accuracy | ± 3 mmHg (0.4 kPa) |

Vitalmax 4000 Modular Product Specifications

| | |
|---------------------------|---|
| NIBP alarm limit | Systolic: Upper 0-255 mmHg (0-34.0 kPa) Lower 0-254 mmHg (0-33.9 kPa) Diastolic: Upper 0-255 mmHg (0-34.0 kPa) Lower 0-254 mmHg (0-33.9 kPa) Mean: Upper 0-255 mmHg (0-34.0 kPa) Lower 0-254 mmHg (0-33.9 kPa) |
| Pulse rate determinations | 30-254 bpm |
| Pulse rate averaging | 4 beat average |
| Pulse rate accuracy | ±3 bpm @ 40-120 bpm ±10 bpm @ 121-200 bpm |
| Pulse rate alarm limits | Upper 0-250 bpm Lower 0-254 bpm |
| Cuffs | Reusable and disposable cuffs Neonate, infant, pediatric, standard adult, large adult, thigh, with 6 foot air hose |

7. TEMPERATURE

| | |
|---------------------|--|
| Temp scale | °F or °C |
| Temp range | 82.4-109.8°F (28.0-43.2°C) |
| Temp accuracy | ± 0.2°F (± 0.1°C) |
| Temp alarm limits | Upper 83.0-110.0 °F (28.3-43.3°C) Lower 83.0-109.9°F (28.3-43.2°C) |
| Δ Temp range | 0-27°F (0-15°C) |
| Δ Temp alarm limits | Upper 0-27°F (0-15°C) Lower 0-26.9°F (0-14.9°C) |
| Temp probes | Skin or rectal/esophageal YSI(TM) 400 Series compatible: for use with invasive pressure models only Medtronics(TM)/ Electromedics 2100 Series(TM) compatible: for use with non-invasive pressure models only |

D. Color TFT LCD Display

| | |
|------------------------|---|
| Technology | Active Matrix TFT LCD (Thin-Film Transistor Liquid Crystal Display) |
| Matrix | SVGA: 800 pixels (Horizontal) x 600 pixels (Vertical) |
| Effective display area | 12.1 inch diagonal |
| Signal Indicators | Green signal LED |

E. Printer

| | |
|----------------------|--|
| Type | Built-in 2-channel thermal array recorder/printer |
| Print mode | Text or waveform |
| Waveforms | Real-time or alarm-triggered (10, 15, 20, or 30 seconds) |
| Resolution | 200 dpi vertical; 400-800 dpi horizontal |
| Waveform annotations | Time, date, speed, channel identification, waveform lead selection |

F. Environmental Specifications

| | |
|-------------------|--|
| Temperature | Operating: 66°F - 86°F (19°C - 30°C) Storage: 40°F - 110°F (4.4°C - 43.3°C) |
| Relative humidity | Operating: 20-80% (non-condensing) Storage: 10-90% (non-condensing) |

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.