Continuous Blood Pressure Monitoring & Hemodynamic Control

CNAP® Monitor 500
Sold as NIBP100D

The next generation of noninvasive monitoring
CNAP® technology

Noninvasive, continuous blood pressure control

CNAP® MONITOR 500

KEY FEATURES

- Easy interfacing with external devices:
  - Data acquisition systems
  - All standard patient monitors
- USB data recording
- Software/display: Beat-to-beat readout, trend over the time, numerical values, waveform analysis
- Easy menu navigation through click-wheel
- Customized Intervention marker
- Integrated printer
- Optional cart for convenient operation

PARAMETERS

Hemodynamics

- Continuous noninvasive blood pressure waveform
  - Sys, Dia, Mean, Pulse
- Upper arm NBP
  - Sys, Dia
  - Automatic scaling to brachial artery

Fluid-management

- PPV
  - Dynamic fluid status

FIELDS OF APPLICATION

- Cardiology/Electrophysiology
- Neurology
- Psychophysiology
- Research
- Anesthesia Monitoring
- Goal Directed Therapy
- Emergency Medicine
- PACU/IMCU
CNAP® Monitor 500

Early detection - quick and easy - reliable and safe

CNAP® BRIDGES THE GAP BETWEEN
UPPER ARM NBP AND INVASIVE MEASUREMENT

<table>
<thead>
<tr>
<th></th>
<th>continuous BP control</th>
<th>ease of use</th>
<th>risk free</th>
<th>pain free</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arterial Line</td>
<td>✓</td>
<td>×</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td>Upper Arm NBP</td>
<td>×</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>CNAP®</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

**BENEFITS**

**Early detection of blood pressure changes**

- Detects blood pressure changes without delay and allows for immediate response
- Helps to identify hemodynamic instabilities
- Direct tracking of the effects of medication and fluid
- Useful in situations where continuous blood pressure is appreciated and an invasive method not applicable or indicated

**Accuracy**

- Continuity, accuracy and waveform dynamics are equivalent to intra-arterial measurement.¹²

**Comfort and safety for the patient**

- Painless, stress-free and without any risk to the patient

**Saves time and cost**

- Reusable CNAP® double finger cuff
- Quick setup and error-free application for everyday use
- Minimal training required

¹ Jelacic T., et al. Precision and accuracy of a new device (CNAP®) for continuous noninvasive arterial blood pressure monitoring: assessment during general anaesthesia. J. A. 2012; 11(9); 264-272
CNAP® in research
An easy solution for complete information

RESEARCHERS COUNT ON CNAP® TECHNOLOGY TO...

...study the influence of slow pressure oscillations on self-paced movements.  
...study the correlation between stroke severity and autonomic dysfunction.  
...study the effects of mainstream media on women’s physiological and psychological functioning.  
...study the detection of deception by use of continuous blood pressure.  
...develop an automated closed-loop double-vasopressor system to treat hypotension during spinal anesthesia for cesarean section.  
...study the relationship between cerebral perfusion during heat stress and the tolerance to a stimulated hemorrhage.

BENEFITS FOR RESEARCH

> Reliable & accurate noninvasive beat-to-beat measurements
> Good for short & long-term monitoring
> Gets running quickly: fast set up & calibration
> Consistent results due to reliable system design
> Easy connection to 3rd party data acquisition systems
> Reusable CNAP® double finger sensors

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CNAP® IN RESEARCH

RESEARCH SYSTEM FEATURES

NBP Cuff
> Automated scaling to brachial pressure (gold standard) at start of measurement and user programmable
> Variety of sizes to fit pediatric thru large adult

Double finger cuffs
> Quick and error-free application
> System includes 3 cuff sizes (small/ medium/ large)
> Long-term recording (24 hrs per hand)
> User selectable rotation interval up to 60 min. per finger

Continuous waveform
> Calibrated pulse waveform
> Continuous tracing of hemodynamic changes without interruptions to recalibrate
> Beat-to-beat systolic, diastolic, mean BP values

Connectivity
> Plug & play integration into all common data acquisition systems and patient monitors

Data storage and analysis
> Unlimited data storage via USB interface
> Data format (*.csv) for import into all common data analysis software packages (e.g. AcaKnowledge®, Matlab, MS Excel, SPSS, etc.)

Accuracy
> Reliably equivalent to invasive blood pressure (IBP) 1,2

APPLICATIONS IN RESEARCH
> Physiology
> Psychophysiology
> Autonomic Function
> Cardiology
> Neurology
> Psychology
> Sports / Exercise Physiology
> Pharmacology

SPECIFICATIONS

Sample rate: 100 Hz

Storage data format: *.csv (BP waveform; beat values, NBP)

Interfaces
- AUX (non isolated): -5V to 5V
- BP Wave Out (isolated): 5µV/V/mmHg

Adult & Pediatric
> ~ 4 years (> 20 kg)

Language Options
> Multilingual display
# TECHNICAL SPECIFICATIONS

**CNAP® - CONTINUOUS NONINVASIVE ARTERIAL PRESSURE**

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systolic</td>
<td>40 - 250 mmHg</td>
</tr>
<tr>
<td>Diastolic</td>
<td>30 - 210 mmHg</td>
</tr>
<tr>
<td>Mean</td>
<td>35 - 230 mmHg</td>
</tr>
<tr>
<td>Pulse Rate</td>
<td>30 - 200 bpm</td>
</tr>
</tbody>
</table>

**Additional NBP – Oscillometric Blood Pressure**
- Automatic scaling to brachial pressure (upper arm)

**Degree of Protection**
- BF (defibrillation proof)

**NBP – OSCILLOMETRIC BLOOD PRESSURE**

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systolic</td>
<td>Adult 40 - 260 mmHg, Pediatric 40 - 230 mmHg</td>
</tr>
<tr>
<td>Diastolic</td>
<td>Adult 20 - 200 mmHg, Pediatric 20 - 160 mmHg</td>
</tr>
</tbody>
</table>

**Accuracy**
- Meets ANSI/AAMI SP10 1992 and 2002

**Degree of Protection**
- BF (defibrillation proof)

**FLUID RESPONSIVENESS: CNAP® PPV**
- Measuring range: 0.2 - 40 %

**ELECTRICAL**

<table>
<thead>
<tr>
<th>Nominal Voltage</th>
<th>100 - 240 VAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>~50/60 Hz</td>
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</tbody>
</table>

**Battery**
- Sealed lead-gel, operating time: 2 hours (fully charged battery)

**PHYSICAL**

<table>
<thead>
<tr>
<th>Weight</th>
<th>7.5 kg (16.6 lbs) including accessories and cables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>280 x 270 x 250 mm (11 x 10.6 x 9.8 inch)</td>
</tr>
</tbody>
</table>

**ENVIRONMENTAL**

<table>
<thead>
<tr>
<th>Temperature Operation</th>
<th>10°C - 40°C (50°F - 104°F), Storage: 0°C - 40°C (32°F - 104°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humidity Operation</td>
<td>30% - 85%, Non-Condensing Storage: 20% - 95%, Non-Condensing, Wrapped</td>
</tr>
<tr>
<td>Altitude</td>
<td>Operation: 647 - 1060 hPa, Storage: 500 - 1060 hPa</td>
</tr>
</tbody>
</table>

**SCREEN**

<table>
<thead>
<tr>
<th>Type</th>
<th>TFT-LCD, 800 x 600 pixel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>8.4 inch diagonally</td>
</tr>
</tbody>
</table>

**USER INTERFACE**

<table>
<thead>
<tr>
<th>Controls</th>
<th>Click-wheel control, Fast access keys</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicators</td>
<td>Visual and audible alarm indication, Battery status, printer status, Power LED</td>
</tr>
<tr>
<td>Trend Display</td>
<td>Customized configuration: Numeric, Graphic, Alarm History</td>
</tr>
</tbody>
</table>

**ADJUSTABLE ALARMING SYSTEM**

<table>
<thead>
<tr>
<th>Alarms</th>
<th>Physiological: Med priority, Technical: Low priority</th>
</tr>
</thead>
</table>

**CONNECTIVITY**

- **BP Wave Out**: Easy integration in all standard patient monitoring systems (2 - 10 VDC supply voltage)
- **AUX Analog Out (optional)**: Analog output of calibrated continuous blood pressure waveform (-5V to 5V)

**USB PORT**

- USB 1.1 (bandwidth 12 MBits/s)

**PRINTER**

- Integrated thermal printer, 58 mm

**COMPLIANCE AND APPROVALS**

- **Safety class II (IEC 60601)**
- **Class II b (93/42/EEC)**
- **Patient applied part type BF**

**PATENTS**

- US 6,669,648
- US 1,179,991
- US 7,390,301
- EP 1,608,261
- EP 1,179,991
- EP 8,114,025
- EP 1,675,507
- EU 2499370
- US 8,343,062
- EU 2499370
- US 2011/105918
- More than 65 patents

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The CNAP® Monitor 500 is CE and FDA approved. The parameter CNAP® PPV is currently not available for use in the U.S. or in clinical environments under FDA control.

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**CNAP® – Setting a new standard for continuous and noninvasive blood pressure measurement.**