SenTec Digital Monitoring System

Continuous noninvasive ventilation monitoring in NICU

PCO2

Continuous | Noninvasive | Accurate | Safe | Easy to Use
Transcutaneous, noninvasive blood gas monitoring

Overcoming limitations of arterial blood gases, etCO2 and SpO2 monitoring
Assessing ventilation in neonatal patients is a challenge. Maintaining normal PaCO2 ranges in neonates is important as abnormal PaCO2 values may have detrimental effects on neonates’ brain and lungs. Neonates in critical care units often have fluctuations of PaCO2.

Arterial blood gas sampling provides only a snapshot every few hours and bears the risk of invasiveness, especially in neonatal patients and is painful.

End-tidal CO2 (etCO2) monitoring is sometimes inefficient in patients with small tidal volumes and inapplicable in certain ventilation modes such as HFO.

Measuring SpO2 alone is not sufficient to detect hyperventilation or hypoventilation. Changes of arterial CO2 levels can never be detected by SpO2 monitoring alone.

Continuous and noninvasive monitoring of tcPCO2 supports therapy guidance for neonates in the NICU

<table>
<thead>
<tr>
<th>Neonatal Journey in the NICU</th>
<th>Prevent</th>
<th>Stabilize</th>
<th>Wean</th>
<th>Recover</th>
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<tbody>
<tr>
<td>Noninvasive Ventilation</td>
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<td>e.g. High Flow Oxygen Therapy or nCPAP</td>
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<td>Invasive Ventilation</td>
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<td>e.g. Conventional ventilation or HFOV/HFJV</td>
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Dedicated to neonatal needs

SenTec digital transcutaneous (tc) sensors provide continuous and accurate measurements, supporting healthcare professionals to monitor ventilation in neonates. For better patient outcomes where it matters most.

Different display options:
- tcPCO2 and heating power trends
- baseline and delta values

V-Sign™ Sensor
PCO2
PCO2 measured by a Stow-Severinghaus type electrode.
- reliable and safe
- clinically trusted for more than 10 years
Set baseline and markers
Set a baseline just before changing the treatment to assess the impact on the patient’s ventilation.

User profiles
Quickly adapt settings to your needs: select individually customized profiles stored in the monitor.

Trendlines allow early detection of ventilation changes
Estimates of PaCO2 in trendline, baselines and delta values.

Relative Heating Power
RHP shows the required heating power to keep the sensor at a set temperature. Changes of RHP may be attributable to changes in perfusion.

Delta values
Numerical indication of the difference between the current reading and the reading from the set baseline and e.g. 10 min before.
Effective and efficient monitoring
Save your time for the important tasks.

**Smart CalMem**
Disconnect the sensor (e.g. to untangle cables or to move the patient) without removing the sensor from the patient. No need to recalibrate the sensor when re-connecting.

**Automatic calibration management**
Simply store the sensor in the Docking Station – calibration is fully automatic. Within a few minutes, “Ready for Use” status is established and maintained until the sensor is applied to the patient.

**Multi Site Attachment Rings (MAR)**
The design enables a gentle sensor application and a smooth removal without damaging the sensitive skin.

**Transportable**
Lightweight, dedicated mounting plates/roll stands, and battery life up to 10 hours.

**Connectivity | Data Management**
Direct connectivity to Patient Monitoring Systems:
- GE
- Philips
- Dräger
- Mindray
- Spacelabs
Excellent accuracy

The high accuracy and safety of the SenTec tcPCO2 sensor has been studied and validated in several clinical studies.

In a 2018 study, Van Weteringen et al. demonstrated that tcPCO2 measured with the SenTec Digital Monitoring System was in good agreement with conventional blood gas analysis. A total of 238 blood samples were analyzed from 69 infants with a gestational age of 24 to 31 weeks. Depending on their gestational age, infants were measured with a sensor temperature of 42 °C and 43 °C. The sensors were calibrated every two to three hours.
Safe sensor temperature and site time management
- A low sensor temperature of 41 °C for tcPCO2 is recommended and allows for up to 8 hours continuous monitoring in neonatal patients.
- Redundant sensor temperature controls to avoid the risk of skin irritations
- Automatic, customizable site time control and site inspection intervals
- Safety-relevant parameters are password-protected.

Best signal quality
Digital Sensor with integrated CPU. Measured signals are digitized and preanalyzed in the sensor head for the best signal quality.

Automatic artifact detection
- Automatic data quality verification and artifact detection
Clinically validated
Numerous clinical studies have been conducted with the SenTec Digital Monitoring System in the neonatal field. Leading neonatal hospitals around the world trust SenTec every day.

**Literature**


2  Mukhopadhyay, S., Maurer, R., Puopolo, K. M.  

3  Brouillette, R. T., Waxman, D.H.  

4  Berkenbosch, J. W., Tobias, J.  

5  Van Weteringen, W., Goos, T.G., van Essen, T., Gangaram-Panday, N.H., de Jonge, R.C.J., Reiss, I.K.M.  
Validation of a transcutaneous tcPO2/tcPCO2 sensor with an optical oxygen measurement in preterm neonates, Poster presentation at 14th European conference on pediatric and neonatal mechanical ventilation, Montreux 2018.

6  Aly, S., El-Dib, M., Mohamed, M., Aly, H.  

7  Sorensen, L.C., Brage-Andersen, L., Greisen, G.  