sentec

Digital Transcutaneous
Blood Gas Monitoring

SenTec Digital Monitoring System

Illuminate Ventilation and Oxygenation in Neonatology

PCO2 | PO2

Continuous | Noninvasive | Accurate | Safe | Easy to Use

Transcutaneous, noninvasive blood gas monitoring

Overcoming limitations of arterial blood gases, etCO2 and SpO2 monitoring
Assessing ventilation and oxygenation 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[1].

Arterial blood gas sampling
provides only a snapshot every few hours and bears the risk of invasiveness, especially in neonatal patients[2], and is painful.

End-tidal CO2 (etCO2) monitoring
is sometimes inefficient in patients with small tidal volumes[3] and inapplicable in certain ventilation modes such as HFO[4].

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 and tcPO2 supports therapy guidance for neonates

Neonatal Journey	Prevent	Stabilize	Wean	Recover
Noninvasive Ventilation e.g. High Flow Oxygen Therapy or nCPAP				
Invasive Ventilation e.g. Conventional ventilation or HFOV/HFJV				

Dedicated to neonatal needs

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

Different display options:
- tcPCO2, tcPO2 and heating power trends
- baseline and delta values

Two different SenTec TC Sensors connectable

V-Sign™ Sensor
PCO2

PCO2 measured by a Stow-Severinghaus type electrode.

- reliable and safe
- clinically trusted for more than 10 years

Optionally available:

OxiVenT™ Sensor
PCO2 | PO2

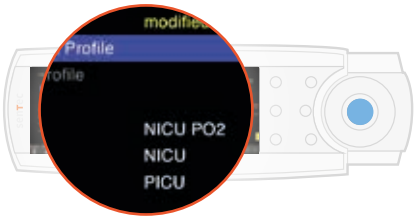
SenTec's OxiVenT™ Sensor combines optical tcPO2 with a state-of-the-art tcPCO2 technique.

PCO2 measured by a Stow- Severinghaus-type electrode.

PO2 measured optically (virtually drift free).

Set baseline and markers
Set a baseline just before changing the treatment to assess the impact on the patient's ventilation and oxygenation.

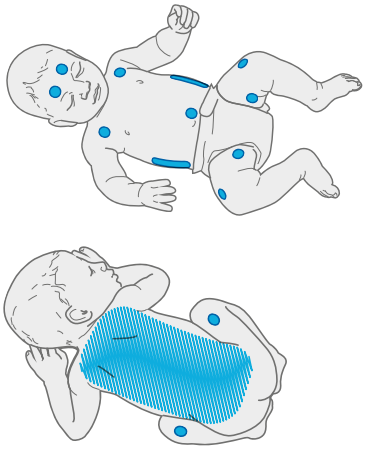
User profiles
Quickly adapt settings to your needs: select individually customized profiles stored in the monitor.



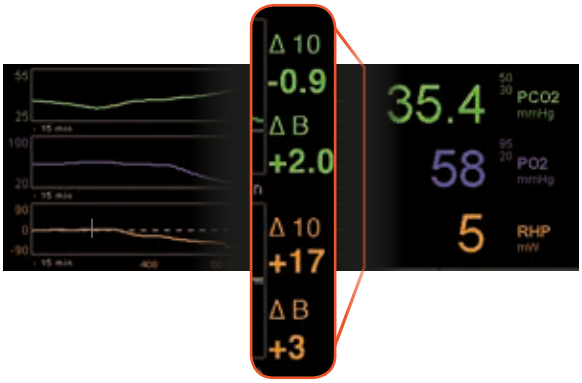
Trendlines allow early detection of ventilation and oxygenation changes
Estimates of PaCO2 and PaO2 in trendline, baselines and delta values.

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.

Select from multiple recommended measurement sites



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.

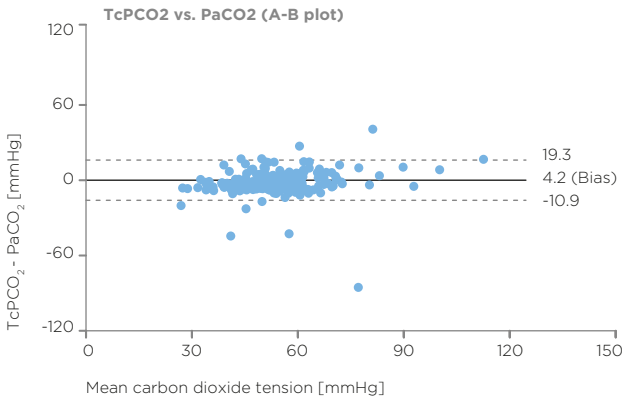
Automatic calibration management
Simply store the sensor in the Docking Station – calibration is fully automatic. Within a few minutes, “Ready for Use” status is established and maintained until the sensor is applied to the patient.

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[5], 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.

Reliable and safe

Safe sensor temperature and site time management

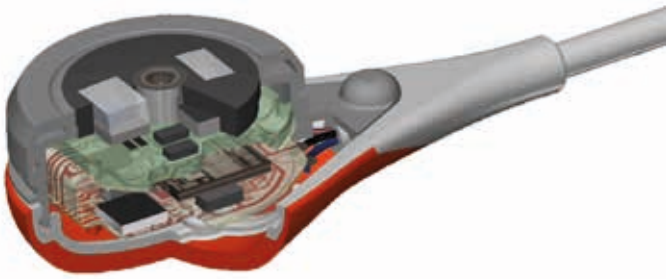
- A low sensor temperature of 41 °C for tcPCO2[6,7] is recommended and allows for up to 8 hours continuous monitoring in neonatal patients.
- Redundant sensor temperature controls to avoid the risk of skin irritations
- Automatic, customizable site time control and site inspection intervals
- Safety-relevant parameters are password-protected.

Automatic artifact detection

- Automatic data quality verification and artifact detection

Best signal quality

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



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

1 **Wyatt, J.S., Edwards, A.D., Cope, M., Delpy, D.T., McCormick, D.C., Potter, A., Reynolds, E.O.**
Response of cerebral blood volume to changes in arterial carbon dioxide tension in preterm and term infants, Pediatr Res., 1991, Jun 29(6): 553-7.

2 **Mukhopadhyay, S., Maurer, R., Puopolo, K. M.**
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3 **Brouillette, R. T., Waxman, D.H.**
Evaluation of the newborn's blood gas status, 1997, Clinical Chemistry 43:1, 215-221.

4 **Berkenbosch, J. W., Tobias, J.**
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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.**
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7 **Sorensen, L.C., Brage-Andersen, L., Greisen, G.**
Effects of the transcutaneous electrode temperature on the accuracy of transcutaneous carbon dioxide tension, Scandinavian Journal of Clinical and Laboratory Investigation, 2011, Vol 71, 7, 548-552.

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