RADIOMETER

TCM5 FLEX monitor Specifications

Hardware

Display

Screen: 9” color, capacitive, multi-touch TFT, 800 x 480 pixels, 16:9 ratio
Display options: trend view, detail view
Screen update rates: Numeric data values (SpO_2, pulse rate, tcpCO_2, tcpO_2, heating power): 1/sec
Trend data range (depends on time axis scale): 1 pixel / 2 sec to 1 pixel / 96 sec
Viewing angle adjustment: -10° / 0° / +8°

Operating conditions

Ambient temperature: 5-40 °C (41 - 107 °F)
Relative humidity: up to 90 %, non-condensing
Atmospheric pressure: 525 - 800 mmHg (700 - 1060 hPa)
Built-in barometer:
  Range: 375-825 mmHg or 50-110 kPa
  Accuracy: ±5 mmHg or 0.67 kPa
Power: 100-240 V, 50-60 Hz, 55-85 VA (max.)
Rechargeable Lithium Ion battery, Type RRC2040
Typical operating time: 4 hours per charge at 25 °C

Connectivity

Network connection: Ethernet 10/100 Base-T full duplex
USB: 3x USB 2.0 (1x side, 2x rear), Type-A (USB 1.1 compatible)
Isolated serial output: USB 2.0, Type-B (USB 1.1 compatible) & RS 232
Isolated Nurse call output: relay contact normally open (calling, closed, not calling, opened), 60V, 2.5A
Isolated analog output: 0-1000 mV
Data protocol: MonLink (2.0, TCM4 series, TOSCA500, MicroGas 7650)

Interface with third-party products

Polysomnographs: Alice 5/6, Embla, Embletta Gold and other.
Patient monitoring systems: Philips, General Electric (GE), Mindray
Mounting system: compatible to GCX mounting system
USB storage: Data export

Dimensions

TCM5 monitor

Width	270 mm
Depth	152 mm
Height	188 mm
Weight	2.5 kg, 2.3 kg (without battery)

Software

Measuring range

Transcutaneous carbon dioxide tension/tcpCO_2:
  5-200 mmHg or 0.7-26.7 kPa
Transcutaneous oxygen tension/tcpO_2:
  0-800 mmHg or 0.0-99.9 kPa
Oxygen saturation/SpO_2: 0-100 % (70-100 % with ±3 digits)
Pulse rate: 25-240 bpm

Site timer

Indication of remaining measuring time
Measuring time elapsed: clock triggers an alarm (and sensor temperature is off after 15 min)

Calibration

Automatic calibration
Calibration gas: CO_2: 7.5%, O_2: 12% , N: 80.5%
Integrated calibration chamber
Maximum interval between two calibrations is set to 12 hours.

Alarm level

OFF, 1-10 (1 is minimum)
OFF: only available in Sleep mode

Patient data storage

Up to 1 year of measuring data in 1-sec data intervals
Download of stored patient data to USB storage

Languages

English, French, German, Czech, Danish, Dutch, Estonian, Finnish, Hungarian, Italian, Japanese, Lithuanian, Chinese, Norwegian, Polish, Portuguese, Romanian, Russian, Slovak, Spanish, Swedish, Turkish

tc Sensor 92, tc Sensor 84 and tc Sensor 54

Sensor performance (in vitro)

tc Sensor 92

Measurement principle:
Stow-Severinghaus-type tc*p*CO_2 sensor combined with Masimo SET® SpO_2 pulse oximetry

Conditions: sensor temperature of 43.0 °C, calibration interval: 12 h

tc*p*CO_2:
Accuracy: (5-200 mmHg): ± 5 mmHg
Response time: (0-90%): ≤ 70 sec
Drift: ≤ 0.5%/h
Linearity: at 1 and 10% CO_2: better than 1 mmHg or 0.13 kPa
at 33% CO_2: better than 5 mmHg or 0.67 kPa

SpO_2:
Accuracy: (70-100%): ± 3 digits

Pulse rate:
Accuracy: (25-240 bpm) ± 3 bpm
SpO_2 and pulse rate: signal averaging 2, 4, 8, 10, 12, 14 and 16 sec
Data update rate: 1 per second

tc Sensor 54

Measurement principle:
Stow-Severinghaus-type tc*p*CO_2 sensor

Conditions: sensor temperature of 43.0 °C, calibration interval: 12 h

tc*p*CO_2:
Accuracy: (5-200 mmHg): ± 5 mmHg
Response time: (0-90%): ≤ 70 sec
Drift: ≤ 0,5%/h
Linearity: at 1 and 10% CO_2: better than 1 mmHg or 0.13 kPa
at 33% CO_2: better than 3 mmHg or 0.40 kPa

tc Sensor 84

Measurement principle:
Stow-Severinghaus-type tc*p*CO_2 sensor combined with Clark-type tc*p*O_2 sensor

Conditions: sensor temperature of 43.0 °C, calibration interval: 12 h

tc*p*CO_2:
Accuracy: (5-200 mmHg): ± 5mmHg
Response time: (0-90%): ≤ 70 sec
Drift: ≤ 1%/h
Linearity: at 1 and 10% CO_2: better than 1 mmHg or 0.13 kPa,
at 33% CO_2: better than 5 mmHg or 0.67 kPa

tc*p*O_2:
Accuracy: (0-20.9 % O_2): ± 5 mmHg
(20.9-100 % O_2): ± 10 %
Response time: (0-90%): ≤ 25 sec
Drift: ≤ 1%/h
Linearity: at 0% O_2: better than 1 mmHg or 0.13 kPa
at 20.9% O_2: better than 3 mmHg or 0.4 kPa
at 50% O_2: better than 5 mmHg or 0.67 kPa
at 90% O_2: better than 25 mmHg or 3.33 kPa

Interference by anesthetic gases (in vitro)

tc*p*CO_2:
75% N_2O, 2% Halothane, 2% Enflurane, 2% Isoflurane, 2% Desflurane, 2% Sevoflurane: negligible

tc*p*O_2:
75% N_2O:<10 mmHg or 1.33 kPa
2% Halothane: approx. 200 mmHg or 26.67 kPa
2% Enflurane, 2% Isoflurane, 2% Desflurane, 2% Sevoflurane: negligible

Sensor dimensions

Diameter: 15 mm or 0.6 in
Height: 8 mm or 0.3 in
Weight: 3 g or 0.1 oz
Sensor cable length: 3 m or 9.8 ft, shielded, flexible, polyurethane coated

Biocompatibility

Not made with natural rubber latex.

Compliance

The TCM5 monitor complies with the following standards: IEC 60601-1 (general safety), IEC 60601-1-2 (EMC), IEC 60601-1-6 (usability),
IEC 60601-1-8 (alarms), IEC 60601-2-23 (transcutaneous monitors), ISO 80601-2-61 (pulse oximeters), ISO 14971 (Risk Management), IEC 62366 (usability engineering) IEC 62304 (Software in medical devices), ISO 10993-1 (biocompatibility), EN1041 (information supplied by manufacturers), ISO 15223-1 (Symbols).

This product complies with the requirements of the Medical Device Directive 93/42/EEC.