

Patient Monitoring and Ventilation



Patient monitoring and ventilation are vital to the care provided by clinicians and EMS personnel. Smiths Medical brands offer reliable, easy-to-use equipment, designed with features that allow efficient management of respiratory emergencies in a wide variety of applications.

BCI® Patient Monitoring products monitor respiration, oxygen saturation, expired carbon dioxide, inspired O₂, and ECG. PneuPac® Transport Ventilators provide emergency support for adults and children in respiratory distress.

Look to these Smiths Medical brands for dependable patient monitoring and ventilation solutions for your transport and bedside needs.

For more information, visit smiths-medical.com/bci or smiths-medical.com/pneupac.

BCITM

PneuPacTM

Pulse Oximeters



Quick. Convenient. Durable.
Oximetry at your fingertip

Digit® Finger Oximeter

- Combines monitor and sensor into one lightweight, pocket-size portable solution
- Easy-to-use one-button keypad
- Provides fast, reliable SpO₂, Pulse Rate and Pulse Strength measurements
- Monitors patients ranging from pediatric to adult
- Large LED display for use in a wide range of light or dark environments
- Pulse-strength bar indicates relative perfusion at the measurement site
- Auto power shutoff after 8 seconds conserves batteries when not in use
- Low-battery indicator flashes when remaining battery time drops under 30 minutes
- Rugged design features four springs enclosed in a high-impact polycarbonate shell



Simple, accurate spot checking

BCI® 3301 Hand-Held Pulse Oximeter

- Durable yet lightweight design
- Ergonomically designed to fit your hand comfortably
- Bright, easy-to-read LED numerals
- Quantitative Pulse Strength bar on screen
- Fast, reliable SpO₂ and Pulse Rate measurements
- Stores data for up to 99 different patients
- Simple On/Off control with auto shutoff to conserve battery life
- Powered by 3 easily replaceable C-cell batteries
- Monitors patients ranging from neonate to adult
- Genuine BCI® reusable and disposable sensors available



Exceptional flexibility from the
hand-held pulse oximetry leader

BCI® 3303 Hand-Held Pulse Oximeter

- 3 operating modes enhance user convenience (clinician, sleep & home)
- Allows menu-free operation via one-touch, direct-function keys
- Easily adjust LED display brightness to optimize viewing
- Adjustable alarm limits for SpO₂ and Pulse Rate
- Instantly distinguish between audible patient alarms and system alerts
- View patient history on-screen; recall up to 99 patient SpO₂ and Pulse Rate readings with 24-hr memory
- Protective rubber boot included
- Pole mount available
- Internal rechargeable NiMH battery
- Genuine BCI® reusable and disposable sensors available



Making quality pulse
oximetry more affordable

BCI® 3180 Pulse Oximeter

- SpO₂, Pulse Rate and Pulse Strength measurements
- Backlit liquid crystal display
- Plethysmographic waveform
- Up to 30 hours of on screen trended data for all parameters
- Easy-to-operate menu structure
- Audible and visual alarms
- AC or battery power
- Monitors patients ranging from neonate to adult
- Genuine BCI® reusable and disposable sensors available

Autocorr® Digital Pulse Oximeter

- Reliably measures SpO₂, Pulse Rate and Pulse Strength
- Uses refined noise-reducing hardware and a patented algorithm to minimize artifact and read through motion
- Analyzes digitized signal at a rate of 120 times per second, creating dynamic templates to validate latest signals
- Real time or trend printouts available when used with an optional printer or PC
- Remote alarm function available
- Internal rechargeable battery
- Genuine BCI® reusable and disposable sensors available



BCI® Serial Autocorrelation (SAC) Technology allows for reliable measurements with motion artifact

FingerPrint® Hand-Held Pulse Oximeter

- SpO₂, Pulse Rate and Pulse Strength measurements
- Integrated printer
- Easy-to-use, 3-key operation
- Cost-effective, portable power: 4 easily replaceable "AA" alkaline batteries
- Auto-shutoff conserves batteries
- "Pulse BEEP" option audibly alerts caregiver of patient status
- Flexible memory trends a single patient or stores select data for up to 99 patients
- Protective rubber boot included
- Monitors patients ranging from neonate to adult
- Genuine BCI® reusable and disposable sensors available



Reliable spot checking and hard copy documentation made easy

MiniCorr™ Hand-Held Pulse Oximeter

- Reliably measures SpO₂, Pulse Rate and Pulse Strength
- SAC Technology rejects spontaneous motion and other artifacts
- Informs operator of excess artifacts and improper sensor positioning
- Easy-to-use, 5-key operation
- Infrared link to printer
- Lightweight for easy transport
- Battery power or optional battery bypass
- Protective rubber boot available
- Genuine BCI® reusable and disposable sensors available



Pulse Oximetry with BCI® Serial Autocorrelation (SAC) Technology

Accessories

A complete line of accessories is available for custom configurations. For more information:

- Visit www.smiths-medical.com/bci
- Call 262-542-3100 or 800-558-2345
- Contact your Smiths Medical PM, Inc. distributor



Capnographs



Monitors patient ETCO₂ data through each phase of patient care

Capnocheck® Capnometer

- Measures ETCO₂ and Respiration Rate
- Fully quantitative – unlike colorimetric devices
- Mainstream technology
- Pocket size, lightweight, and easy to use
- No calibration or warm-up time required
- Available with or without alarms
- Battery powered – 2 AAA



Full-featured performance with hand-held versatility

Capnocheck® II Hand-Held Capnograph/Oximeter

- Measures ETCO₂, Inspired CO₂, Respiration Rate, SpO₂ and Heart Rate
- Provides waveforms, numeric values and on-screen trending
- Easy-to-read EL back-lit LCD display
- Adjustable alarm limits, as well as visual and auditory alarms
- Sidestream technology accommodates intubated and non-intubated patients
- Lightweight for easy transport
- Infrared link to an external printer assures trouble-free download
- Monitor patients ranging from pediatric to adult
- Genuine BCI® reusable and disposable accessories available
- Protective rubber boot included
- Capnograph only version also available



Reliably monitor ETCO₂... plus SpO₂ and FiO₂

Capnocheck® Plus Capnograph

- High-resolution vacuum display
- Simplified menu structure for easy operation
- Economical sidestream technology
- Monitor-intubated and non-intubated patients
- Breath-by-breath CO₂ detection allows rapid response to patient changes
- Flexibility to incorporate SpO₂ and FiO₂ technology options
- Patented moisture removal system
- 4-channel analog output for polysomnography interfacing
- Genuine BCI® reusable and disposable accessories available
- Optional remote patient alarm interface with nurse call systems

Transport Ventilators

Pneupac® VR1 Emergency and Transport Ventilator

- Single control for tidal volume/frequency control enables quick set-up for patient requirements
- Auto/manual control allows operator to choose automatic mode or to provide ventilation manually
- Integrated patient demand system allows synchronized interaction with the patient's own breathing efforts
- Linked manual controls allow the ventilator to be used in a variety of chest compression/ventilation options in cardiac life support
- Powered by oxygen to eliminate the need for electricity
- Optional Air Mix feature provides approximately 50 percent oxygen with a flick of a switch
- MRI compatible



Designed for caregivers wherever emergencies occur

paraPAC Transport Ventilator

- Individual controls for setting tidal volume and frequency when establishing breathing parameters
- Dedicated click stop CPR setting (protected airway) allows instant selection of CPR ventilation frequency
- Adjustable pressure relief valve (with audible alarm) prevents generation of excess pressure in lungs
- Unique SMMV/Demand function – Ventilation ON monitors and responds to inspiratory efforts; Ventilation OFF allows 100% oxygen therapy
- Air mix (100/50%) O₂ selector can triple gas cylinder life at 50% setting
- Large, easy-to-read inflation pressure monitor permits quick visualization
- Optional capability for positive end expiratory pressure (PEEP)
- Optional integrated pressure monitoring alarm system
- MRI compatible



Enables greater control of breathing parameters

ventiPAC Transport Ventilator

- Assisting professional can alter inspiratory/expiratory phase of ventilation
- Adjustable pressure relief valve (with audible alarm) prevents generation of excess pressure in lungs
- Unique SMMV/Demand function – Ventilation ON monitors and responds to inspiratory efforts; Ventilation OFF allows 100% oxygen therapy
- Air mix (100/50%) O₂ selector can triple gas cylinder life at 50% setting
- Separate controls provide precise administration of inspiratory/expiratory time and flow for optimum ventilation breathing parameters
- Large, easy-to-read inflation pressure monitor permits quick visualization
- Optional capability for positive end expiratory pressure (PEEP)
- Optional integrated pressure monitoring alarm system
- MRI compatible



Covers the widest range of ventilation parameters

babyPAC™ Transport Ventilator

- Adjustable pressure relief with audible alarm
- Inflation pressure monitor provides visualization of ventilation inflation pressure
- Separate controls for inspiratory time and expiratory time
- Four operating modes
- Unique oxygen concentration control (21% through 100%)
- PEEP/CPAP control
- Inspiratory pressure control (continuous adjustment)
- Optional integrated pressure monitoring alarm system
- MRI compatible



Delivers ventilation to small, sensitive lungs with precision and confidence

Pulse Oximeters

Specifications/Technical Data

	BCI® 3180	BCI® 3301	BCI® 3303	Autocorr®	FingerPrint®	MiniCorr™
Displays & Indicators	<ul style="list-style-type: none"> • Backlit LCD: SpO₂, pulse rate, pulse strength • 8-segment bar graph: pulse strength • Low battery icon lights when battery is low • LED lights: audio paused or off; charging • Message indicates: SpO₂ sensor problem; SpO₂ search; signal strength low; lost pulse 	<ul style="list-style-type: none"> • LED numeric: SpO₂, pulse rate • 8-segment bar graph; pulse strength • Keys: ON & OFF 	<ul style="list-style-type: none"> • LED numeric: SpO₂, pulse rate • 8-segment bar graph; pulse strength • LED flashes low battery, alarm silence, sensor • Keys: ON & OFF 	<ul style="list-style-type: none"> • 3-digit LED: SpO₂, pulse rate • 10-segment bar graph; pulse strength • LED flashes: low battery, alarm silence, sensor, lost pulse alarm • light indicates: search, artifact, power 	<ul style="list-style-type: none"> • LED numeric: SpO₂, pulse rate • 8-segment bar graph; pulse strength • Keys: ON/OFF, print & speaker ON/OFF 	<ul style="list-style-type: none"> • LED numeric: SpO₂, pulse rate • 8-segment bar graph; pulse strength • LED lights: low battery, audio disabled, sensor, artifact, power • Keys: ON/OFF
Alarms	Adjustable	—	Adjustable	Adjustable	—	Adjustable
SpO₂ (functional)	<ul style="list-style-type: none"> • Range: 0-100% • Accuracy: adult ±2%; neonate ±3% at 70-100% <70% unspecified • Averaging: 4, 8, 16 beats 	<ul style="list-style-type: none"> • Range: 0-99% • Accuracy: ±2% at 70-99% <70% unspecified • Averaging: 8 beats 	<ul style="list-style-type: none"> • Range: 0-100% • Accuracy: ±2% at 70-100% ±3% at 50-69% • Averaging: 4, 8, 16 beats 	<ul style="list-style-type: none"> • Range: 0-100% • Accuracy: ±2% at 70-100% ±3% at 50-69% (no motion) ±3% at 70-100% (motion) • Averaging: 4, 8, 16 beats 	<ul style="list-style-type: none"> • Range: 0-99% • Accuracy: ±2% at 70-99% <70% unspecified • Averaging: 8 beats 	<ul style="list-style-type: none"> • Range: 0-99% • Accuracy: ±2% at 70-99% ±3% at 50-69% • Averaging: 4, 8, 16 beats
Pulse Rate	<ul style="list-style-type: none"> • Range: 30-254 • Accuracy: greater of ±2 bpm or ±2% • Averaging: 8 or 16 sec 	<ul style="list-style-type: none"> • Range: 30-254 • Accuracy: ±2% at 30-254 bpm • Averaging: 8 sec 	<ul style="list-style-type: none"> • Range: 30-254 • Accuracy: ±2% at 30-254 bpm • Averaging: 8 or 16 sec 	<ul style="list-style-type: none"> • Range: 30-254 • Accuracy: ±2% at 30-254 bpm (no motion) Unspecified (motion) • Averaging: 8, 16 sec 	<ul style="list-style-type: none"> • Range: 30-254 • Accuracy: greater of ±2 bpm or ±2% at 30-254 bpm • Averaging: 8 sec 	<ul style="list-style-type: none"> • Range: 30-254 • Accuracy: greater of ±2 bpm or ±2% at 30-254 bpm • Averaging: 8 or 16 sec
Trend Storage	12 hrs at 4 sec 36 hrs at 12 sec 90 hrs at 30 sec	1,000 Spot Checks, up to 99 patients	Up to 99 patients & 24 hours of run time	Data saved every 4 to 30 seconds	14 hours of 30 second intervals of SpO ₂ , pulse rate & relative time	Up to 90 hours of SpO ₂ , pulse rate, signal strength & relative time
Power Requirements	Lead-acid battery internal rechargeable AC	(3) "C" cell alkaline or NiCAD batteries	NiMH (Nickel Metal Hydride) internal rechargeable (not user replaceable) AC	• AC charger • Lead-acid battery (not user replaceable)	(4) "AA" alkaline or NiCAD batteries	(6) "AA" alkaline batteries or optional external 12 VDC power supply
Analog Output	N/A	NA	NA	0-1 VDC	Integrated printer: 1-inch wide thermal printer paper 15 characters/line	SpO ₂ and pulse rate every 5 seconds
Serial Output	RS232C trend table output Serial infrared link-real time patient data	RS232C	RS232	RS232	RS232C	IR and RS232
Dimensions	8W x 6.5 H x 5D in 20.3 x 16.5 x 12.7 cm	6.8H x 3.3W x 1.5D in 17.2 x 8.4 x 3.7 cm	7.25H x 3.3W x 1.85D in 18.4 x 8.4 x 4.7 cm	3.24H x 8.5W x 5.5D in 8.2 x 21.6 x 14 cm	6.6H x 2.75W x 1.43D in 16.7 x 7.0 x 3.6 cm	6.6H x 2.75W x 1.43D in 16.7 x 7.0 x 3.6 cm
Weight	4.5 lbs (2 kg)	16.5 oz (462 grams) with batteries	19 oz (539 grams)	30 oz (850 grams)	13 oz (369 grams) with batteries	16 oz (454 grams) with batteries
Regulatory Compliance	ISO 9001/ISO 13485	ISO 9001/ISO 13485	ISO 9001/ISO 13485	ISO 9001/ISO 13485	ISO 9001/ISO 13485	ISO 9001/ISO 13485
Catalog Numbers	3180	3301	3303	3304	3401	3402

Pulse Oximeters and Capnographs

Specifications/Technical Data

	Digit®	Capnocheck®	Capnocheck® II	Capnocheck® Plus
Displays & Indicators	<ul style="list-style-type: none"> LED numeric: SpO₂, pulse rate LED bar graph: pulse strength 	<ul style="list-style-type: none"> LED numeric: ETCO₂, respiratory rate 14-segment bar graph: CO₂ 	<ul style="list-style-type: none"> LCD with EL back light numeric: SpO₂, pulse rate 8-segment bar graph; pulse strength (optional) 	<ul style="list-style-type: none"> Vacuum fluorescent Alarm, charge, silenced indicators Factory; user select trends CO₂; CO₂/pleth waveform
Alarms	—	Adjustable (WW8110-001 only)	Adjustable	Adjustable
Flow Rate	—	—	120 ± 20 ml/min	150 ± 20 ml/min
CO₂	—	<ul style="list-style-type: none"> Measurement: non-dispersive IR absorption Measurement range: 0-99 mm Hg Accuracy: 0-40 mm Hg ±2 mm Hg, 41-99 mm Hg 6% of reading, during standard conditions Rise Time: <60 ms Total System Response Time: <0.5 sec. 	<ul style="list-style-type: none"> Measurement: non-dispersive IR absorption Measurement range: 0-10% Display range: 0-100mmHg; 0-13.3 kPa; 0-10% CO₂ Accuracy: greater of ±2mmHg; or 4% of reading 	<ul style="list-style-type: none"> Measurement: non-dispersive IR absorption Measurement range: 0-10% Display range: 0-100mmHg or 0-10.0% CO₂ or 0-13.3 kPa Accuracy: greater of ±2 mmHg; ±0.3%; ±0.3 kPa or 4% of reading
Respiration Rate	—	—	<ul style="list-style-type: none"> 0-150 bpm Averaging: 4 breath Accuracy: ±1 bpm 	<ul style="list-style-type: none"> Range: 0-150 bpm Averaging: 4 breath avg Accuracy: ±1 bpm
SpO₂ (functional)	<ul style="list-style-type: none"> Range: 0-99% Accuracy: ±2% at 70-99% <70% unspecified Averaging: 8 beats 	—	<ul style="list-style-type: none"> Range: 0-100% Accuracy: ±2% at 70-100%, ±3% at 50-69% Averaging: 8 beats 	<ul style="list-style-type: none"> Range: 0-100% Accuracy: ±2% at 70-100%, ±3% at 50-69% Averaging: 4, 8, 16 beats
Pulse Rate	<ul style="list-style-type: none"> Range: 30-254 Accuracy: greater of ±2 bpm or ±2% at 30-254 bpm Averaging: 8 sec 	—	<ul style="list-style-type: none"> Range: 30-254 Accuracy: greater of ±2 bpm or ±2% at 30-254 bpm Averaging: 8 sec 	<ul style="list-style-type: none"> Range: 30-250 Accuracy: greater of ±2% or ±2 bpm at 30-250 bpm Averaging: 8, 16 sec
Trend Storage	—	—	—	Up to 16 hours at 12 second data interval; Up to 10 hours at 4 second data interval
Power Requirements	[2] "AAA" cell alkaline batteries (IEC type LR03)	[2] "AAA" cell alkaline batteries (2 x 1.5VDC) (IEC type LR03)	Lithium-Ion replaceable, internal rechargeable	<ul style="list-style-type: none"> AC Charger Nickel cadmium battery
Analog Output	—	—	N/A	Any 3 of: CO ₂ waveform, pleth, ETCO ₂ , resp rate, inspired CO ₂ , %SpO ₂ , pulse rate, fractional inspired oxygen, 0V - 1V cal signal
Serial Output	—	—	Serial infrared	RS232C
Dimensions	2.25H x 1.7W x 1.5D in 5.72 x 4.32 x 3.81 cm	2.1H x 1.5W x 1.5D in 52 x 39 x 39 mm	5.0H x 4.38W x 2.9D in 12.7 x 11.1 x 7.37 cm	3.5H x 10.0W x 5.5D in 8.9 x 25.4 x 14 cm
Weight	3 oz (85 grams)	2.1 oz (60 g) with batteries	22 oz (0.63 kg)	4.8 pounds (2.2kg)
Regulatory Compliance	ISO 9001/ISO 13485	93/42/EEC UL/CSA 60601-1	ISO 9001/ISO 13485	ISO 9001/ISO 13485
Catalog Numbers	3420 Y - yellow casing	WWW8110-001SYS: Capnocheck® Capnometer with Alarms (mm Hg); WW8110-000SYS: Capnocheck® Capnometer (mm Hg)	8400: Capnograph/Oximeter 8401: Capnograph	9004

Transport Ventilators

Specifications/Technical Data

	ventiPAC	Pneupac® VR1	paraPAC	babyPAC™
Principle of Operation	Time/volume cycled		Time/volume cycled	Time cycled pressure generator
User Type	Adults, children and infants greater than 11 lbs (5 kg)		Adults, children and infants greater than 11 lbs (5 kg)	Neonates & Infants up to 44 lbs (20 kg)
Ventilation Mode	Demand – SMMV/demand		Demand – SMMV/demand	CMV+PEEP; CMV+ACTIVE PEEP; IMV+CPAP, CPAP
Tidal Volume	1500-50 ml		1300 – 70 ml	330 – 0 ml
Inspiratory Time	0.5 – 2.0 secs		—	0.25 – 2.0 secs
Expiratory Time	0.6 – 6.0 secs		—	0.25 – 4.0 secs; IMV 2.5 – 40 secs
Frequency	7 – 60 b/min		8 – 40 b/min (12 b/min at click stop)	10 – 80 b/min (I:E 1:2); 12 – 96 b/min (I:E 1:1.5); 15-120 b/min (I:E 1:1)
Flow Range	6 – 60 L/min	11 – 32 L/min	6 – 60- L/min	Preset at 10 L/min
I:E Ratio	Variable over a wide range		1:3 at 8 b/min to 1:1.3 at 40 b/min	Variable over a wide range
Air Mix	100 or 50% O ₂		100 or 50% O ₂	45 – 100% O ₂ oxygen only as supply 21 – 70% O ₂ oxygen & air as supply
Pressure Relief with Pneumatic Audible Alarm	20 – 80 cm H ₂ O (20 – 80 x 100Pa)	40 cm H ₂ O standard 60 cm H ₂ O optional when purchased	20 – 80 cmH ₂ O (20 – 80 x 100Pa)	10 – 80 cm H ₂ O (10 – 80 x 100Pa)
Electronic Pressure Monitoring/Alarm System	Optional		Optional	Optional
Inflation Pressure Monitor	-10 to + 100 cm H ₂ O -10 to + 100 (x 100) Pa		-10 to + 100 cm H ₂ O -10 to + 100 (x 100) Pa	-10 to + 100cmH ₂ O -10 to + 100 (x 100) Pa
PEEP Capability	Optional 0 – 20 cm H ₂ O (0 – 20 x 100Pa)		Optional 0 – 20 cm H ₂ O (0 – 20 x 100Pa)	0 – 20 cm H ₂ O (0 – 20 x 100Pa) with click action warning above 10 cm H ₂ O
MRI Compatible	3 Tesla actively shielded magnet with a max gradient of 430G/cm and RF of 0.82 W/kg at 125.5 Mhz	Yes	3 Tesla actively shielded magnet with a max gradient of 430G/cm and RF of 0.82 W/kg at 125.5 Mhz	3 Tesla actively shielded magnet with a max gradient of 430 G/cm and RF of 0.82 W/kg at 125.5 Mhz
Dimensions	3.7H x 8.7W x 6.4D in 92H x 220W x 162D mm	3.94H x 3.74W x 6.69D in 100H x 95W x 170D mm	3.7H x 8.7W x 6.4D in 92H x 220W x 162D mm	3.7H x 8.7W x 6.4D in 92H x 220W x 162D mm
Weight	6.6 lbs (3.0 kg) 6.8 lbs (3.1 kg) with integrated alarm system	14.82 ounces (420 grams)	6.6 lbs (3.0 kg) 6.8 lbs (3.1 kg) with integrated alarm system	8.3 lbs (3.75 kg)
Standards	EN60601-1, EN794-3: 1999	EN60601-1, EN794-3: 1999	EN60601-1, EN794-3: 1999	EN60601-1, EN794-3: 1999

Information subject to change without notice. Please read the instructions for use supplied with the product for detailed instructions, warnings and cautions.

Q-Line for U.S.A. customers call 1-800-348-1842 for clinical application information.

For more information, please call Smiths Medical PM, Inc., at 262-542-3100 or 800-558-2345, or your Smiths Medical distributor.

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Patient Monitoring and Ventilation

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The products described are covered by one or more of the following U.S. Patent Nos. 351,023; 5,386,833; 5,437,275; 5,558,096; 5,615,091 Autocorr, babyPAC, Capnocheck, Digit, FingerPrint, MiniCorr, Pneupac, BCI and Smiths Medical design mark are trademarks of the Smiths Medical family of companies.

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