GE Medical Systems
Information Technologies

DASH® 4000 Pro - Patient Monitor

Highlights

The DASH 4000 Pro Patient Monitor provides unmatched adaptability at the bedside.

By combining modularity and portability, the DASH 4000 Pro takes the flexible bed concept to a new level... allowing clinicians to bring the ICU to any patient or easily adapt to specific departmental needs.

- **Modular flexibility**
  - Affordably add capabilities with plug-and-play convenience
  - Smart Anesthesia Multi-Gas (SAM®) module provides breath-by-breath analysis of respiratory and anesthetic gases
  - SAM instantaneously identifies and quantifies agents, alone or in mixture

- **Gold-standard arrhythmia detection**
  - EK-Pro simultaneous multilead arrhythmia detection sets the standard for sensitivity and specificity in a patient monitor
  - Multiple leads assure uninterrupted monitoring and help detect localized events that otherwise might be missed
  - Incremental updating helps eliminate noise, for accurate tracking of subtle, progressive changes in beat shapes
  - Predictive reliability dependent on 12-lead quality; our 12SL® remains the industry's most thoroughly 12-lead analysis for sensitivity and specificity

- **Early intervention in the NICU**
  - High-resolution CRG provides early indication of physiological shifts in neonates
  - Memory required for High-resolution CRG Trends is built-in

- **Gold standard NIBP accuracy**
  - Only full-featured monitor with DINAMAP® technology built-in
  - System consistently produces the most accurate, reliable NIBP determinations available in a bedside monitor
  - Stepped deflation with patented peak matching technology helps ride through artifact
  - Ideally suited for NICU, PICU and hypertensive patients

DASH® 4000 Pro - Patient Monitor

Specifications

Display

Size: 26 cm (diagonal); Type: Active-matrix color TFT; Resolution: 640 by 480 pixels; Number of traces: 6 (maximum);
Number of seconds/trace: 4.9 at 25 mm/sec; Sweep speed: 6.25, 12.5, 25 mm/sec (with erase bar);
Information window: Displays non-real-time information without obstructing the display of real-time information;
Display organization: Prioritized by parameter

Controls

Trim Knob®control
Five hard keys: Silence Alarm, Graph Go/Stop, NBP Go/Stop, Function (zero all) and Power On/Off

Alarms

Categories: Patient status and system status; Priority: 4 levels – Crisis, Warning, Advisory, Message;
Notification: Audible and visual; Setting: Default and individual; Silencing: 1 minute, current alarm only;
Pause: 5 minutes in Adult ICU mode, 3 minutes in Neonatal ICU mode, and 5 minute, 15 minute, or permanent pause in OR mode;
Volume: Default 70%, 70 dB measured at 1 meter

ECG

Standard leads available: I, II, III, V, aVR, aVL, and aVF; 10 leadwire cable: I, II, III, V, aVR, aVL, aVF, V2, V3, V4, V5, V6;
Leads analyzed simultaneously: I, II, III, and V (multi-lead mode); Lead fail: Identifies failed lead;
Alarms: User-selectable upper and lower heart rate limits

Input specifications

Voltage range: ± 0.5 mV to ± 5 mV; Signal width: 40 ms to 120 ms (Q to S); Heart rate range: 30 to 300 bpm;
Input impedance: Common mode: > 10 Mat 50/60 Hz, Differential: > 2.5 Mfrom dc to 60 Hz;
Common mode rejection: 90 dB minimum at 50 or 60 Hz

Output specifications

Frequency response Display: Diagnostic: 0.05 to 40 Hz
Monitoring: 0.05 to 40 Hz, Moderate: 0.05 to 25 Hz, Maximum: 5 to 25 Hz; Paper;
Recorder: Diagnostic: 0.05 to 100 Hz
Monitoring: 0.05 to 40 Hz, Moderate: 0.05 to 25 Hz, Maximum: 0.05 to 25 Hz;
Noise: < 30 µV (referred to input)

Pacemaker detection/rejection

Input voltage range: ± 2 mV to ± 700 mV; Input pulse width: 0.1 ms to 2 ms; Rise time: 10 µs to 100 µs;
Over/under shoot: 2 mV (max); Baseline drift: < 0.5 mV per hour with a ± 700 mV, 2-ms pacemaker pulse applied

Respiration

Measurement technique: Impedance variation detection;
Range Respiration rate: 0 – 200 breaths per minute; Base impedance: 100 – 1000 Ωat 52.6 kHz;
Detection sensitivity: 0.4 to 10 Ωvariation; Waveform display bandwidth: 0.1 to 1.8 Hz (–3 dB);
Alarms: User-selectable upper and lower respiration rate limits, and user-selectable apnea limit

Temperature

Number of channels: 2;

Input specifications

Probe type: YSI Series 400 or 700 (determined by input cable); Temperature range: 0°C to 45°C (32°F to 113°F);
Resolution: ± 0.1°C

Output specifications

Parameters displayed: T1, T2; Accuracy: (independent of source) ± 0.1°C for YSI series 400 probes; ± 0.3°C for YSI series 700 probes;
Alarms: User-selectable upper and lower limits for T1, T2

Invasive Blood Pressure

Number of channels: 2 (optional); Transducer sites: Arterial, femoral artery, pulmonary arterial, central venous, right atrial, left atrial, intracranial, and special;
Transducer requirements: Excitation voltage: 5 V dc ± 0.1%; Transducer output: 5 µV/V/mmHg

Input specifications

Range: –25 mmHg to 300 mmHg; Offset: ± 150 mmHg

Output specifications

Frequency response: dc to 50 Hz (–0/+2 Hz); Zero balance range: ± 150 mmHg; Zero balance accuracy: ± 1 mmHg;
Zero balance drift: ± 1 mmHg over 24 hours; Accuracy: ± 2% or ± 1 mmHg, whichever is greater (exclusive of transducer);
Alarms: User-selectable upper and lower limits for systolic, diastolic, and mean pressures

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DINAMAP Noninvasive Blood Pressure

Measurement technique: Oscillometric; Displayed parameters: Systolic, diastolic, and mean pressures, time of last measurement; Measurement modes: Manual, auto, and stat in Adult ICU and OR modes; manual and auto in neonatal mode; Measurement range(s): Resolutions of 5 mmHg up to Maximum Adult/Pediatric/Neonate limits

Systolic:

Adult: 30-275mmHg; Pediatric: 30-235mmHg; Neonate: 30-135mmHg

MAP:

Adult: 20-260mmHg; Pediatric: 20-260mmHg; Neonate: 20-125mmHg

Diastolic:

Adult: 10-220mmHg; Pediatric: 10-220mmHg; Neonate: 10-110mmHg

Pulse rate, as displayed in tabular trends:

Adult: 30-200 bpm; Pediatric: 30-200 bpm; Neonate: 30-200 bpm

Cuff pressure range:

Adult: 0-275mmHg; Pediatric: 0-235mmHg; Neonate: 0-135mmHg; Overall system accuracy: Meets or exceeds SP 10-1992 AAMI standards; Total cycle time: 20 to 40 seconds typical (dependent on heart rate and motion artifact); Automatic cycle times: 0 to 8 hours; Tubing length: 12 feet adult, 8 feet neonatal; Automatic cuff deflation: Cycle time exceeding 3 minutes (90 seconds neonatal), power off, or cuff pressure exceeds 294 mmHg (±6 mmHg) adult, 147 (±3 mmHg) neonatal

Cuff sizes:

Disposable: Large adult, adult, small adult, pediatric, small pediatric, and infant;
Reusable: Thigh, large adult, adult, child, and infant;
Alarms: User-selectable upper and lower limits for systolic, diastolic, and mean pressures

Cardiac Output

Input specifications

Probe type: In-Line or bath probe; Catheter size: 5F, 6F, 7F, 7.5F, and 8F; Injectate volume: 3, 5, or 10 cc

Output specifications

Parameters displayed: Cardiac output, blood temperature, injectate temperature, trial number;
Range:
Cardiac output: 0.2 – 15 (liters per minute); Blood temperature: 30 – 42°C; Injectate temperature: 0 – 30°C
Accuracy:
Cardiac output: ± 5%; Blood temperature: ± 0.2°C; Injectate temperature: ± 0.3°C;
Frequency response: dc to 15 Hz ± 2 Hz

Pulse Oximetry

Parameters monitored: Arterial oxygen saturation (SpO_2) and peripheral pulse rate (PPR); SpO_2 range: 50 – 100%; PPR range: 30 – 300 beats per minute; Accuracy: Actual accuracy depends on probe. Please reference manufacturer's specifications.; SpO_2 : ± 2% (70 – 100% SpO_2); ± 3% (50 – 69% SpO_2); PPR: ± 3 beats per minute;
Alarms: User-selectable upper and lower limits for SpO_2 and PPR

CO_2

Information displayed

Inspired and expired CO_2 concentrations in %, mmHg, or kPa; respiratory rate, continuous CO_2 waveform

Measurement range

Pi CO_2 /Fi CO_2 : 0 to 100 mmHg / 0 to 13%; Pe CO_2 / Fe CO_2 : 0 to 100 mmHg / 0 to 13%; RR: 0 to 120 breaths/min

Accuracy

CO_2: 5% of reading or ±2 mmHg, whichever is greater; Display resolution: 1 mmHg; Rise time: Less than 60 msec; Respiration rate accuracy: ±1 breath/min

Compensations: O_2/N_2O compensation: Operator selectable; Barometric pressure compensation: Automatic

Performance Specifications

Technology

Type: Novametrix Medical Systems' CAPNOSTAT III; Sensor: Mainstream non-dispersive infrared (NDIR) absorption, dual wavelength ratiometric, true single beam optics.
Warm-up time: 2 minutes warm-up time to meet accuracy specifications; waveform immediate upon power up, calculated end tidal after two breaths; Cable Length: 10 feet (3.0 m)

Calibration

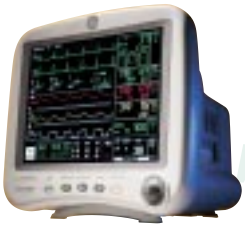
Simple one-step calibration; no calibration gases required.

Airway adapters

Types: Adult reusable (standard), adult disposable, neonatal;
Deadspace/chamber volume:
Adult reusable: < 5 cc, Adult disposable: < 5 cc, Neonatal: < 0.5 cc

Alarms

CO_2 : High inspired CO_2; high/low expired CO_2; Respiratory rate: Adjustable high and low



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Paper Recorder	
	Method: Thermal dot array; Horizontal resolution: 480 dots/in @ 25 mm/sec; Vertical resolution: 200 dots/in; Number of waveform channels: four; Paper width: 50 mm (1.97 in); Paper length: 30 m (100 ft); Paper speed: 0.1, 0.5, 1, 5, 10, 12.5, 25, and 50 mm/sec (±2%)
Analog Output	
ECG	
	Gain: 1 V/mV ± 10%; DC offset: ± 100 mV (max); Noise: < 5 mV peak to peak 0 – 300 Hz; Frequency response: 0.05 Hz to 100 Hz – 0/+7 Hz
Blood pressure	
	Gain: 10 mV/mmHg ± 2%; DC offset: ± 20 mV (max); Noise: < 5 mV peak to peak 0 – 300 Hz; Frequency response: dc to 50 Hz – 0/+2 Hz
Battery	
	Battery type: Exchangeable Lithium-Ion; Maximum number of batteries: 2; Voltage: 11.1 V (nominal); Capacity: 3.9 Ah; Charge time: Less than 4 hours each; Run time: 4 to 5 hours; Battery life: 500 cycles to 50% capacity
Environmental Specifications	
	Power requirements: 90-132 VAC 50/60 Hz 2.0A, 190-264 VAC 50/60 Hz 1.0A; Power consumption: 75 W (fully loaded); Cooling: convection; Heat dissipation: 240 Btu/hr (max) **Operating Conditions** Ambient temperature: 0-40°C (32-104°F) While charging batteries: 0-35°C (32-95°F); CO_2 Sensor: 10-40°C (59-104°F); Relative humidity: 5-95% @40°C; Vibration: MIL-STD 810E, Method 514.4, Category 1; Altitude: -610 to 4.570 m (-2,000 to 15,000 ft.) **Storage Conditions** (do not exceed): Maximum: 70°C (158°F) at 95% relative humidity; Minimum: –40°C (–40°F); CO_2 Sensor: –30 to 65°C (–22 to 149°F); Batteries: –20 to 60°C (–4 to 140°F)
Physical Specifications	
	Height: 27,4 cm, Depth: 24,3 cm, Width: 29,3 cm, Weight: 5.7 kg
Certification	
	UL 2601-1 classified. UL classified for CAN/CSA C22.2 No. 601.1; IEC 60601-1 certified. CE Marking for the 93/42/EEC Medical Device Directive.
Warranty	
	Standard warranty is one year.

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