GE Healthcare

Dash 3000, 4000 & 5000

Flexible acuity monitoring

The Dash" monitoring family is a portable monitoring system that is flexible and easy to use. The adaptability of the Dash monitors allows the acuity level of any bed to be modified to meet changing patient needs.

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- Provides a continuous stream of patient data, enabling a personalized information workflow that helps support quality care decisions

- Hard-wired and wireless network connectivity enable access to CIS, CVIS, PACS, RIS, HIS and more than 350 beds without central station support

- Built-in wireless option enables you to monitor ambulatory patients or transform any bed into a monitored bed

- Lightweight, rugged and intra-hospital transportable with optional batteries that last up to five (5) hours and can be swapped out without interruption

- GE EK Pro arrhythmia program uses simultaneous multi-lead ECG analysis across four leads to accurately detect arrhythmias

- Unique IntelliRate! algorithm helps reduce false alarms by evaluating key data from multiple parameters before triggering alarms

- GE DINAMAP" blood pressure algorithms support speed, comfort and artifact rejection while retaining a high standard of accuracy

- GE-exclusive atrial fibrillation detection algorithm provides alarm- and time-based trending to indicate the state of atrial fibrillation

- Up to four invasive blood pressure readings with a Smart BP artifact rejection program help reduce false alarms

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Technical specifications

Display

Size	Dash 3000 (8.4 in), Dash 4000 (10.4 in), Dash 5000 (12.1 in)
Type	Active-matrix color LCD
Resolution	Dash 3000 (640 by 480 dpi), Dash 4000 (640 by 480 dpi), Dash 5000 (800 by 600 dpi)
Number of traces	7 (maximum)
Number of seconds/trace	Dash 3000 4.9 s at 25 mm/sec, Dash 4000 6.0 s at 25 mm/sec, Dash 5000 6.9 s at 25 mm/sec
Sweep speed	6.25, 12.5, 25 mm/sec (with erase bar)

Controls

TrimKnob® control	Dash
Hard keys	Silence Alarm/Admit, Print, NBP Go/Stop, Zero All, and Power
Dash 5000 adds	Trend, NBP Auto, Admit/Discharge, Standby, and Main Display
Remote control	Optional

Wireless LAN

Communication protocol	IEEE 802.11a/b/g
Operating frequency	4.9 to 5.85GHz; 2.4 to 2.5GHz
Transmit power	18dBm
Data rate	2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, and 54Mbps
Wireless security	Wireless Equivalent Protection (WEP 128 bit); Wireless Protected Access (WPA-PSK TKIP); IEEE 802.11i Wireless Protected Access Version 2 Advanced Encryption Standard (WPA2-PSK AES-CCMP)
RF compliance	USA: FCC Part 15.247, 15.407; Canada: RSS-210; EU: EN 300 328, EN 301 893; Japan: ARIB STD-T33, ARIB STD-T66, ARIB STD-T71; Australia: AS/NZS 4268

Performance specifications

Alarms

Categories	Patient status and system status
Priority	4 levels (Crisis, Warning, Advisory and 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 5 minutes, 15 minutes or permanent pause in OR mode
Volume	Default 70 dB measured at 1 meter

Invasive blood pressure

Number of channels	Up to 4 (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 (-3 dB)
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

DINAMAP non-invasive blood pressure

Technology	DINAMAP classic and SuperSTAT (SuperSTAT only available with Masimo® and Nellcor® OxiMax® SpO$_2$)	
Measurement technique	Oscillometric	
Displayed parameters	Systolic, diastolic and mean pressures, time of last measurement	
Measurement modes	Adult ICU and OR modes; manual, auto and stat, neonatal mode; manual and auto	
Systolic	Adult	30-285 mmHg
	Pediatric	30-235 mmHg
	Neonate	30-140 mmHg
MAP	Adult	20-260 mmHg
	Pediatric	20-220 mmHg
	Neonate	20-125 mmHg
Diastolic	Adult	10-220 mmHg
	Pediatric	10-210 mmHg
	Neonate	10-110 mmHg
Pulse rate	As displayed in tabular trends or 3 waveform display	
	Adult	30-200 bpm
	Pediatric	30-200 bpm
	Neonate	30-220 bpm

Other specifications

Overall system accuracy	Meets or exceeds SP 10-2002 AAMI standards
Automatic cycle times	1 minute to 4 hours
Tubing length	Adult (12 ft), Neonatal (8 ft)
Automatic cuff deflation	Cycle time exceeding 3 minutes (90 seconds neonatal),
	French mode: Cycle time exceeding 2 minutes (60 seconds neonatal), Power off, or cuff pressure exceeds 294 mmHg (±6 mmHg) Adult, 250 mmHg (±5 mmHg) Pediatric, 147 mmHg (±3 mmHg) Neonatal
Cuff sizes	Thigh, large adult, adult, small adult, child, infant and neonatal, sizes #5 - #1 and assorted long sizes
Alarms	User-selectable upper and lower limits for systolic, diastolic and mean pressures

CO$_2$

Technology
Supports Respironics Novametrix® CapnoStat® (mainstream) and CapnoFlex LF (low-flow sidestream) CO$_2$ technologies

Principle of operation	Non-dispersive infrared (NDIR) single beam optics, dual wavelength and no moving parts
Warm-up time	From connection of the module at room temperature, it is 80 seconds to maximum initial CO$_2$ indication and 3 minutes to full operating specifications
Cable length (mainstream)	2.4 m (8 ft)
Sample line length (low-flow sidestream)	2.1 m (7 ft)

Information displayed
Inspired and expired CO$_2$ concentrations in %, mmHg or kPa; respiratory rate, continuous CO$_2$ waveform

Measurement range
At 760 mmHg at an ambient temperature of 25°C (77°F)

Measurement range	0-100 mmHg, 0-13%, 0-12.5 kPa, PiCO$_2$ /FiCO$_2$ 0-50 mmHg, 0-6.5%, 0-6.25 kPa
Respiration rate range	
Low-flow sidestream	0-150 breaths per minute
Mainstream	0-120 breaths per minute

Accuracy
At 760 mmHg at an ambient temperature of 25°C

Mainstream	0-40 mmHg: ± 2 mmHg; 41-70 mmHg: ± 5% of reading; 71-100 mmHg: ± 8% of reading
Sidestream	0-40 mmHg ± 2 mmHg; 41-70 mmHg ± 5% of reading; 71-100 mmHg ± 8% of reading; all specifications ± 12% of actual from 80-150 breaths per minute
Display resolution	1 mmHg

Rise time	Less than 200 ms (low-flow sidestream) Less than 60 ms (mainstream adult reusable or single patient use) Less than 50 ms mainstream infant reusable or single patient use)
Respiration rate accuracy	± 1 breath per minute

Compensations

Automatic barometric pressure	± 25 mmHg from 530-785 mmHg
Operator-selectable	O_2/N_2O compensation

Calibration

Mainstream	One-step calibration (less than 20 seconds); no calibration gases required.
Low-flow sidestream	No routine user calibration required

Airway adapters and sample lines - mainstream (airway adapters)

Types	Adult reusable (standard), adult disposable, infant
Deadspace	Adult reusable/disposable < 5 cc, Infant disposable < 1 cc Taper meets ISO 5356-1

Low-flow sidestream airway adapters

Types	Adult reusable (standard), adult disposable, infant
Deadspace	Adult reusable/disposable < 7.3 cc, Infant disposable < 1 cc
Adult, pediatric and infant	Nasal CO_2 and nasal CO_2/O_2
Adult and pediatric	Nasal/oral CO_2 and nasal/oral CO_2/O_2

Alarms

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

Analog output

ECG

Gain	1 V/mV ± 10%
DC offset	± 100 mV (max)
Noise	< 5 mV peak to peak 0-300 Hz
Frequency response	Refer to frequency response section under ECG

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

Temperature

Number of channels	2

Input specifications

Probe type	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	± 0.2°C (25 to 45°C), ±0.4°C (0 to 25°C) with EN 12470-4 compliant probes
Alarms	User-selectable upper and lower limits for T1, T2

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 and trial number

Range

Cardiac output	0.2-15 L/min
Blood temperature	30 to 42°C (86 to 107.6°F)
Injectate temperature	0 to 30°C (32 to 86°F)

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	GE Ohmeda® (40-100%), Masimo (30-100%), Nellcor (1-100%)
PPR range	GE Ohmeda (30-250 BPM), Masimo (25-240 BPM) Nellcor (20-300 BPM)
Accuracy	Actual accuracy depends on probe. Please reference manufacturer's specifications.
GE Ohmeda	SpO_2 ± 2% (70-100% SpO_2)
Masimo	SpO_2 ± 2% (70-100% SpO_2)
Nellcor	SpO_2 ± 2% (70-100% SpO_2)
PPR	± 3 beats per minute (for Nellcor PPR range 251 to 300 bpm, unspecified)
Alarms	User-selectable upper and lower limits for SpO_2 and PPR

ECG

Standard leads available	I, II, III, V, aVR, aVL and aVF
3 leadwire	I, II, or III
5 leadwire	I, II, III, V, AVR, AVL, and AVF
10 leadwire	I, II, III, AVR, AVL, AVF, VI, V2, V3, V4, V5 and 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 M Ω at 50/60 Hz
Differential	> 2.5 M Ω from dc to 60 Hz
Common mode rejection	90 dB minimum at 50 or 60 Hz

Output specifications

Impulse response	*For an impulse of 3 mV applied for 100 ms:* Displacement following impulse < 0.1 mV Slope following impulse < 0.3 mV/s
Frequency response	Response of non-permanent displays is limited by resolution to 40 Hz (-3 dB) @25 mm/s Specified upper frequency limits may vary by ± 2 Hz
Diagnostic mode	0.67 Hz (+0.4 dB) to 100 Hz (-3 dB)
For compliance with China National Standard:	1.0 Hz (+0.4dB) to 75 Hz (-3 dB)
Monitoring mode	0.67 (+0.4 dB) to 40 Hz (-3 dB)
Moderate mode	0.67 (+0.4 dB) to 25 Hz (-3 dB)
Maximum mode	5.0 Hz (-0.3 dB) to 25 Hz (-3 dB)
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	0-200 breaths per minute for variations of 1.0 - 10.0 Ω
Respiration rate	0-200 breaths per minute
Base impedance	100-1000 Ω at 52.6 kHz
Detection sensitivity	0.4 to 10 Ω variation
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

Paper recorder

Method	Thermal dot array
Horizontal resolution	480 dots/in at 25 mm/sec
Vertical resolution	200 dots/in
Number of waveform channels	4
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%)

Power specifications

Battery type	Exchangeable Lithium-Ion
Maximum number of batteries	2
Voltage	11.1 V (nominal)
Capacity	≥ 3.45 Ah (varies with manufacturers)
Charge time	Less than 4 hours each
Run time	2 hours per battery
Battery life	500 cycles to 50% capacity

Environmental specifications

Voltage requirements	100-120 VAC and 200-240 VAC
Power consumption	75 W (fully loaded)
Cooling	Convection
Heat dissipation	680 Btu per hour (max)

Operating conditions

Ambient temperature	0 to 40°C (32 to 104°F) Nellcor 0 to 35°C (32 to 95°F)
While charging batteries	0 to 35°C (32 to 95°F)
CO_2 sensor	10 to 40°C (50 to 104°F)
Relative humidity	5-95% @40°C (104°F)
Altitude	-382 to 3,011 m (-1,253 to 9,879 ft).

Transport/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

Dimensions (H x W x D)

Dash 5000	28.7 x 30.7 x 23.9 cm (11.3 x 12.2 x 9.4 in)
Dash 4000	27.4 x 29.3 x 24.3 cm (10.8 x 11.5 x 9.6 in)
Dash 3000	26.0 x 28.0 x 20.0 cm (10.25 x 11.0 x 8.0 in)

Weight

Dash 5000	6.4 kg (14.0 lb)
Dash 4000	5.5 kg (12.2 lb)
Dash 3000	5.1 kg (11.2 lb)

* Weight of product without batteries.

Certification

IEC/EN/UL 60601-1, CAN/CSA C22.2 No. 601.1,
IEC/EN 60601-1-2, IEC/EN 60601-1-4, IEC/EN 60601-2-27,
IEC/EN 60601-2-30, IEC/EN 60601-2-34,
IEC/EN 60601-2-49, ANSI/AAMI SP10,
ISO 9919, EN 12470-4 and ISO 21647
CE Marking: Medical Devices Directive - 93/42/EEC
IEC/EN 60601-1-1

Warranty

One year.

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About GE Healthcare:

GE Healthcare provides transformational medical technologies and services that are shaping a new age of patient care. Our broad expertise in medical imaging and information technologies, medical diagnostics, patient monitoring systems, drug discovery, biopharmaceutical manufacturing technologies, performance improvement and performance solutions services help our customers to deliver better care to more people around the world at a lower cost. In addition, we partner with healthcare leaders, striving to leverage the global policy change necessary to implement a successful shift to sustainable healthcare systems.

Our "healthymagination" vision for the future invites the world to join us on our journey as we continuously develop innovations focused on reducing costs, increasing access and improving quality around the world. Headquartered in the United Kingdom, GE Healthcare is a unit of General Electric Company (NYSE: GE). Worldwide, GE Healthcare employees are committed to serving healthcare professionals and their patients in more than 100 countries. For more information about GE Healthcare, visit our website at www.gehealthcare.com.

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