MDPRO F6/F6EXPRESS

FETAL MONITORS

Physical Specifications

Dimensions (DxWxH)	347mm x 330mm x 126mm
Weight	F6 5.3kg approx. F6 Express 6.1kg approx.
Display	10.1 inch 800 x 600 Pixel Multicolor LCD
Signal Interface	RS232 Interface (DB9 or D-Sub) RJ45 Interface
Ultrasound Transducer	8-Crystal Transducer Cable Length 2.5m Weight 190g Dimension 88mm x 35mm Color Pink
TOCO Transducer	Cable Length 2.5m Weight 180g Dimension 88mm x 35mm
Remote Event Marker	Cable Length 2.5m Weight 56g
ECG	Cable Length 3m Weight 213g
SpO_2	Cable Length 2.4m Weight 68g
NIBP	Cable Length 3.3m Weight 194g
TEMP	Cable Length 3m Weight 55g

Power Supply

Main Supply	Operating Voltage 100V ~ 240V ~ Operating Frequency 50Hz/60Hz Input Power 1.0 ~ 0.5A
Rechargeable Li-ion Battery	Nominal Voltage 14.8V Nominal Capacity 5000mAh Continous Working Time >2 hours Necessary Charge Time <7 hours Cycle Life >300 times

Recording

Recorder	Thermal Dot-matrix Recorder
Paper	Z-fold, Thermosensitive (Compatible with GE and Philips recorder papers)
Paper Width	152mm/150mm
Effective Printing Width	110mm (American Standard) 120mm (International Standard)
FHR Printout Width	70mm (American Standard) 80mm (International Standard)
FHR Scaling	30bpm/cm (American Standard) 20bpm/cm (International Standard)
TOCO Printout Width	40mm
TOCO Scaling	25%/cm
Printing Speed	Standard Speed (Real-Time Traces) 1/2/3 cm/min Fast Print Speed (Stored Traces) Up to 15mm/sec
Accuracy of Data	± 5% (X-Axis) ± 1% (Y-Axis)
Resolution	8 dots/mm
Record Information	FHR1 trace/mark, FHR2 trace/mark, TOCO trace, AFM trace/black mark, fetal movement mark, event mark (and annotation), AUTO-zero symbol, alarm indicator, SOV alarm indicator, US1 and US2 signal loss alarm indicator, wired/wireless monitoring status mark, date, time, printing speed, ID, name, FHR2 Offset, HR, SpO2, SYS, DIA, MAP, PR, TEMP, CTG analysis results etc.

FHR

Operating Mode	PW with Autocorrelation
Working Frequency	(1.0±10%)MHz
FHR Measurement Range	50bpm - 240bpm
Resolution	1bpm
Accuracy	±2bpm
Alarm	FHR Alarm
Ultrasound Output	$I_{SPPA.3}$<190W/cm² $I_{SPTA.3}$<94mW/cm ² I_{SATA}<20mW/cm² TI<1.0 MI<1 .0
Temperature Rise	When applied to the patient, the ultrasound transducer may warm slightly (less than 2°c (3.6°F) above ambient temperature). When NOT applied, at the ambient temperature of 40°C (104°F), the ultrasound transducer may reach the highest temperature of 43°C(109.4°F).

FHR (Continued)

Effective Radiating Area	(628 ± 15%)mm²
Dielectric Strength	4000Vrms
Other Info	p- <1MPa Iob <10mW/cm² Ispta<100mW/cm² Max Output Power <15mW

TOCO

TOCO Range	0 ~ 100
Non-linear Error	±10%
Resolution	1
Baseline Drift due to Temperature Changes	1 unit/min/°C (free air) 5 units/min/°C (underwater)
Zero Mode	Automatic (TOCO value becomes zero or below lasting for 30 seconds)/Manual
Dielectric Strength	>4000Vrms

DCG

DFHR Measurement Range	30bpm ~ 240bpm
Resolution	1bpm
Accuracy	±1bpm
Alarm	DFHR Alarm
Technique	Peak-peak detection technique
Input Impedance	>10MΩ (Differential, DC50/60Hz) >20MΩ (Common Mode)
CMRR	>110dB
Noise	<4μVp
Skin Voltage Tolerance	±500mV
Fetal Input Voltage Current	20μVp ~ 3mVp

IUP

Pressure Range	0mmHg ~ 100mmHg (0.0kP ~ 13.3 kPa)
Non-linear Error	±3mmHg (±0.4kPa)
Resolution	1 mm Hg (0.1 kPa)
Sensitivity	5μV/V/mmHg
Zero Mode	Manual

MFM & AFM

Display Range	0 ~ 999
FM Mode	Automatic/Manual
AFM Mode	Trace (default)/Black Mark
AMF Technique	Pulsed Doppler Ultrasound

MECG

MHR Measurement Range	30bpm ~ 240bpm
MHR Measuring Accuracy	±2 bpm
Resolution	1 bpm
MHR Alarm Limits	30bpm ~ 240bpm
Alarm	HR Alarm
Anti-electric Shock Type	Defibrillating-proof
Input Signal Range	±8 mV PP
ECG Waveform	Manual control ECG waveform display
ECG falls off	Detect Automatically
Patient Leakage Current (Limit)	N.C. S.F.C. d.c. 10μA 50μA a.c. 10μA 50μA
Patient Auxiliary Current (Limit)	N.C. S.F.C. d.c. 10μA 50μA a.c. 10μA 50μA
Differential Input Impedance	>5MΩ
Display Sensitivity	2.5mm/mV (x0.25), 5mm/mV (x0.5), 10mm/mV (x1), 20mm/mV (x2), AUTO gain
Electrode Offset Potential Tolerance	±500mV
Auxiliary Current (Leads off detection)	Active electrode < 100nA Reference electrode: <900nA

MECG (Continued)

Accuracy and Response to Irregular Rhythm	According with ANSI/AAMI EC13-2002 Sect.4.1.2.1 e) The MHR value displays after a stable period of 20s: Ventricular bigeminy 80bpm±1 bpm Slow alternating ventricular bigeminy 60bpm± 1 bpm Rapid alternating ventricular bigeminy 120bpm±1 bpm Bidirectional systoles 91 bpm± 1 bpm
Bandwidth (-3dB)	Diagnosis 0.05 Hz ~ 150 Hz Monitor 0.5 Hz ~ 40 Hz
Response Time to Change in MHR	MHR range 80bpm ~ 120bpm Range 7s ~ 8s (average 7.5s) MHR range 80bpm ~ 40bpm Range 7s ~ 8s (average 7.5s)
Tall T-wave Rejection	Exceeds ANSI/MMI EC13-2002 Sect. 3.1.2.1 (C) minimum recommended 1.2mV T-Wave amplitude

SpO_2

Measurement Range	50% ~ 100%	
Measuring Accuracy (EDAN)	90% ~ 100% 70% ~ 90% <70%	±2% ±4% unspecified
Measuring Accuracy (Nellcor)	70% ~ 100% <70%	±2% unspecified
Data Update Period (EDAN)	1s	
Data Update Period (Nellcor)	2s	
PR Measurement	Range 30 ~ 240bpm Resolution 1 bpm Accuracy ±3bpm	
SpO_2 Alarm Limits	50% ~ 100%	
Alarm	PR Alarm and SpO_2 Alarm	
Wavelength	Red light (660±3)nm Infrared light (905±10)nm Emitted light energy <15mW	

NIBP

Measurement	Systolic Pressure Diastolic Pressure Mean Artery Pressure
Method	Oscillometric Method
Measurement Range	Systolic Pressure 40mmHg ~ 270mmHg (5.3kPa ~ 36.0kPa) Diastolic Pressure 10mmHg ~ 215mmHg (1.3kPa ~ 28.7kPa) Mean Artery Pressure 20mmHg ~ 235mmHg (2.7kPa ~ 31.3kPa)

NIBP (Continued)

Resolution	1 mm Hg (0.1 kPa)
Measuring Accuracy	Max. average deviation ≤±5mmHg (≤±0.8kPa) Max. standard deviation ≤8mmHg (≤1.2kPa)
Measuring Time (Normal)	30 ~ 45s
Measuring Time (MAX)	120s
Alarm Limits	Systolic Pressure 40mmHg ~ 270mmHg (5.3kPa ~ 36.0kPa) Diastolic Pressure 10mmHg ~ 215mmHg (1.3kPa ~ 28.7kPa) Mean Artery Pressure 20mmHg ~ 235mmHg (2.7kPa ~ 31.3kPa)
Alarm	Systolic Pressure Diastolic Pressure Mean Artery Pressure Alarm
Software Over Voltage Protection	(297±3)mmHg [(39.6±0.4)kPa]
Hardware Over Voltage Protection	(320±10)mmHg [(42.8±1.3)kPa]
Cuff pressure measuring range	0mmHg ~ 300mmHg (0.0kPa ~ 40.0kPa)

TEMP

Channel	1
Measurement Range	0°C ~ 50°C
Resolution	0.1°C
Accuracy	±0.3°C (Transducer error excluded ±0.1°C) (Transducer ≤±0.2°C)
Unit	°C/°F
Refresh Time	1 ~ 2s
Self-Check	5 ~ 10min
Alarm Limits	0.0°C ~ 50.0°C
Alarm	TEMP Alarm
Measuring Mode	Direct Mode
Position	Axilla

Data Transmission

Data Export	Ethernet/USB
Report Format	TRC
Data Management System	MFM-CNS
HIS connection	HL7/GDT

Safety Specifications

Standards Compliance	IEC 60601-1 :2005, EN 60601-1:2006/AC:2010, IEC 60601-1-2:2007, EN 60601-1-2:2007/AC:2010, IEC/EN 60601-2-27, IEC/EN 60601-2-37, IEC/EN 60601-2-49, IEC 80601-2-30, ISO 80601-2-61, ISO 80601-2-56, EN 12470-4, AAMI/ANSI EC13	
Anti-electric Shock Type	Class I equipment with internal power supply	
Anti-electric Shock Degree	FHR1, FHR2, TOCO, FM, IUP SpO2, NIBP DECG ECG, TEMP	BF BF (Defibrillating-proof) CF CF (Defibrillating-proof)
Degree of Protection against Harmful Ingress of Water	Main Unit IPX1, protected against vertically falling water drops (provided recorder drawer is shut and the monitor is not mounted on the wall vertically). US/TOCO Transducers IPX8, protected against the effects of continuous emersion in water	
Degree of Safety in Presence of Flammable Gases	Equipment not suitable for use in presence of flammable gases	
EMC	CISPR11 Group 1 Class A	
Working System	Continuous Operation	

Environmental Specifications

Temperature	Working +5°C ~ +40°C (+41 °F ~ + 104°F) Transport and Storage -20°C ~ +55°C (-4 °F ~ + 13"1° F)
Relative Humidity	Working 15% ~ 93% (non-condensing) Transport and Storage 15% ~ 93% (non-condensing)
Atmospheric Pressure	Working 86kPa ~ 106kPa Transport and Storage 70kPa ~ 106kPa