iM50

Patient Monitor

Version 1.1

Data Sheet

EDAN

iM50 Patient Monitor Specification		
Physical Specifications		
Dimension	261 mm (W) × 215 mm (H) ×198 mm (D)	
Weight	< 3.6 kg (standard configuration, without battery)	
Power Supply		
Power Supply	100 V to 240 V~, 50 Hz/60 Hz	
Current	1.0 A-0.5 A	
Battery		
Battery Type	Rechargeable lithium-ion battery	
Capacitance	2500 mAh , 5000 mAh	
Operating Time	2500 mAh	≥3.5 h
	5000 mAh	≥7 h
Charge Time	2500 mAh	≤3.5 h, 100% charge ≤3.15 h, 90% charge
	5000 mAh	≤6.5 h, 100% charge ≤5.85 h, 90% charge
Display		
Display screen	8.4 inch color TFT, touch screen available	
Resolution	800×600	
Wave	A maximum of 13 waveforms (with 12-lead ECG function)	
Recorder		
Record Width	48 mm	
Paper Speed	12.5 mm/s, 25 mm/s, 50 mm/s	
Channels	3	
Recording types	Continual real-time recording 8-second real-time recording 20-second real-time recording, Trend graph recording Trend table recording NIBP review recording Arrhythmia review recording Alarm review recording Drug calculation titration recording Hemodynamic Calculation result recording Oxygenation Calculation result recording Ventilation Calculation result recording Renal Function Calculation result recording 12-lead diagnosis recording C.O. measurement recording Frozen waveform recording	

Data Storage		
Internal Temporary Memory	Trend data	1 hour, at 1 s resolution 120 hours, at 1 min resolution
	Alarm events	Up to 200 sets
	NIBP Measurement data	1200 sets
	Arrhythmia events	Up to 200 sets
	12-lead Diagnosis results	Up to 50 sets
Non-volatile Memory (internal or external storage device)	A single piece of patient data maximally contains the following information:	
	Trend graph and trend table	240 hours
	NIBP measurement review	1200 sets
	Alarm review	200 sets
	Arrhythmia event	200 sets
	12-lead diagnosis review	50 sets
	Full disclosure Waveforms	48 hours
Wi-Fi		
IEEE	802.11b/g/n	
Frequency Band	2.4 GHz ISM band	
Interfaces and others		
Nurse call / analog output/ defibrillator synchronization	1	
USB Interfaces	2	
VGA Interface	1	
Network Interface	1	
Anti-theft lock interface	1	
ECG		
Lead Mode	3-Lead: I, II, III 5-Lead: I, II, III, aVR, aVL, aVF, V 12-Lead: I, II, III, aVR, aVL, aVF, V1, V2, V3, V4, V5, V6	
Lead naming style	AHA, IEC	
Display Sensitivity (Gain Selection)	1.25 mm/mV (×0.125), 2.5 mm/mV (×0.25), 5 mm/mV (×0.5),10 mm/mV (×1), 20 mm/mV (×2), 40 mm/mV (×4), AUTO gain	
Sweep speed	6.25 mm/s, 12.5 mm/s, 25 mm/s, 50 mm/s	
Bandwidth (-3 dB)	Diagnosis: 0.05 Hz to 150 Hz Monitor: 0.5 Hz to 40 Hz Surgery: 1 Hz to 20 Hz	
CMRR	Diagnosis: >95 dB Monitor: >105 dB Surgery: >105 dB	
Notch	In diagnosis, monitor and surgery modes: 50 Hz/60 Hz (Notch filter can be turned on or off manually)	

Recovery time after defibrillation	<5 s		
ESU Protection	Cut mode: 300 W Coagulation mode: 100 W Restore time: ≤10 s		
Pace pulse detecting lead	one among I, II, III, AVR, AVL, AVF, V1, V2, V3,V4, V5, V6		
Heart Rate			
Range	Adult: 15 bpm to 300 bpm Ped: 15 bpm to 350 bpm		
Accuracy	±1% or ±1 bpm, whichever is greater		
Resolution	1 bpm		
PVC			
Range	Adult: 0 to 300 PVCs/ min Ped/Neo: 0 to 350 PVCs/ min		
Resolution	1 PVCs/min		
ST value			
Range	-2.0 mV to +2.0 mV		
Accuracy	-0.8 mV to +0.8 mV: ±0.02 mV or 10%, whichever is greater. Beyond this range: not specified.		
Resolution	0.01 mV		
Arrhythmia analyses			
Asystole	Sustain VT	V-Fib/V-Tach	ExtremeTachy
ExtremeBrady	V-Tach	Vent Brady	Tachy
Brady	Wide QRS Tachy	Non-Sustain VT	Afib
Vent Rhythm	Acc. Vent Rhythm	Pause	Pauses/min High
PVCs High	R on T	PVC Bigeminy	PVC Trigeminy
Pacer not Pacing	Pacer not Capture	Missed Beat	VEB
PVC	Couplet	Run PVCs	Multiform PVCs
IPVC	Irr Rhythm	PAC Bigeminy	PAC Trigeminy
Low Voltage(Limb)			
12-lead ECG synchronization analysis			
Average parameters of heart beat			
Heart rate (bpm)			
Time limit of P wave (ms)			
PR interval (ms)			
QRS interval (ms)			
QT/QTC (ms)			
P-QRS-T AXIS			

RESP			
Method	Impedance between RA-LL, RA-LA		
Measurement lead	Options are lead I and II		
Measuring Range	Adult	0 rpm to 120 rpm	
	Ped/Neo	0 rpm to 150 rpm	
Resolution	1 rpm		
Accuracy	Adult	6 rpm to 120 rpm: ±2 rpm 0 rpm to 5 rpm: not specified	
	Ped/Neo	6 rpm to 150 rpm: ±2 rpm 0 rpm to 5 rpm: not specified	
Gain Selection	×0.25, ×0.5, ×1, ×2, ×3, ×4, ×5		
Sweep	6.25 mm/s, 12.5 mm/s, 25.0 mm/s, 50.0 mm/s		
Apnea Alarm Time	10 s, 15 s, 20 s, 25 s, 30 s, 35 s, 40 s		
NIBP			
Method	Oscillometry		
Mode	Manual, Auto, Continuous		
Measuring Interval in Auto Mode	1/2/3/4/5/10/15/30/60/90/120/180/240/360/480 min		
Continuous	5 min, interval is 5 s		
Measuring Type	SYS, DIA, MAP, PR		
Measuring Range	Adult Mode	SYS: 40 mmHg to 270 mmHg DIA: 10 mmHg to 215 mmHg MAP: 20 mmHg to 235 mmHg	
	Pediatric Mode	SYS: 40 mmHg to 230 mmHg DIA: 10 mmHg to 180 mmHg MAP: 20 mmHg to 195 mmHg	
	Neonatal Mode	SYS: 40 mmHg to 135 mmHg DIA: 10 mmHg to 100 mmHg MAP: 20 mmHg to 110 mmHg	
Cuff Pressure Measuring Range	0 mmHg to 300 mmHg		
Pressure Resolution	1 mmHg		
Maximum Mean Error	±5 mmHg		
Maximum Standard Deviation	8 mmHg		
Maximum Measuring Period	Adult/Pediatric	120 s	
	Neonatal	90 s	
Typical Measuring Period	20 s to 35 s (depend on HR/motion disturbance)		

Overpressure Protection	Adult	297±3 mmHg
	Pediatric	245±3 mmHg
	Neonatal	147±3 mmHg
PR		
Measuring range	40 bpm to 240 bpm	
Accuracy	±3 bpm or 3.5%, whichever is greater	
SpO_2		
EDAN Module		
Measuring Range	0% to 100%	
Resolution	1%	
Data update period	1 s	
Accuracy	Adult/Pediatric	±2% (70% to 100% SpO_2) Undefined (0% to 69% SpO_2)
	Neonatal	±3% (70% to 100% SpO_2) Undefined (0% to 69% SpO_2)
PI (Perfusion Index)		
Measuring Range	0-10	
Resolution	1	
Pulse Rate		
Measuring Range	25 bpm to 300 bpm	
Resolution	1 bpm	
Accuracy	±2 bpm	
Nellcor Module		
Measuring Range	1% to 100%	
Resolution	1%	
Data Update Period	1 s	
Accuracy	DS-100A, OXI-A/N(Adult) D-YS (Adult and Pediatric) OXI-P/I (Pediatric)	±3% (70% to 100% SpO_2)
	MAX-A, MAX-AL, MAX-N, MAX-P, MAX-I, MAX-FAST (Adult and Pediatric)	±2% (70%～100% SpO_2)
	MAX-A, MAX-AL, MAX-N, MAX-P, MAX-I, MAX-FAST (Adult and Pediatric)	±3% (60%～80% SpO_2)
	If sensor is used for neonate as recommended, the accuracy will be larger than adult by ±1.	
Pulse Rate		
Measuring Range	20 bpm to 300 bpm	
Resolution	1 bpm	
Accuracy	±3 bpm (20 bpm to 250 bpm)	

TEMP		
Channel	2	
Sensor type	YSI-10K and YSI-2.252K	
Technique	Thermal resistance	
Measure Parameter	T1, T2, TD	
Position	Skin, Oral, Rectum	
Unit	°C , ºF	
Measuring Range	0°C to 50°C (32 ºF to 122 ºF)	
Resolution	0.1°C (0.1 ºF)	
Accuracy	Accuracy (not including sensor): ±0.1°C	
	Sensor accuracy: ≤ ±0.2°C	
Transient Response Time	≤30 s	
Quick TEMP[1)]		
Measuring Range	25°C ~ 45°C (monitoring mode) 35.5°C ~ 42°C (prediction mode)	
Sensor Type	Oral/Axillary sensor, Rectal sensor	
Resolution	0.1°C	
Accuracy (not including sensor)	±0.1°C (25°C ~ 45°C) (monitoring mode)	
Sensor accuracy	≤ ±0.2°C	
Update time	1 s ~ 2 s	
Warm-up time	Less than 10 seconds	
Prediction time	Less than 30 seconds	
IBP		
Channel	2	
Technique	Direct invasive measurement	
Measuring range	Art	0 mmHg to +300 mmHg
	PA	-6 mmHg to +120mmHg
	CVP/RAP/LAP/ICP	-10 mmHg to +40 mmHg
	P1/P2	-50 mmHg to +300 mmHg
Resolution	1 mmHg	
Accuracy (not including sensor)	±2% or ±1 mmHg, whichever is greater ICP: 0 mmHg to 40 mmHg: ±2 % or ±1 mmHg, whichever is greater; -10 mmHg to 0 mmHg: undefined	
Unit	kPa, mmHg, cmH2O	
PR		
Measuring Range	20 bpm to 300 bpm	

Resolution	1 bpm		
Accuracy	30 bpm to 300 bpm: ±2 bpm or ±2%,whichever is greater; 20 bpm to 29 bpm: undefined		
CO_2			
EDAN G2 Module			
Intended patient	Adult, Pediatric, Neonatal		
Measure Parameters	$EtCO_2$, $FiCO_2$, AwRR		
Unit	mmHg, %, kPa		
Measuring Range	CO_2	0 mmHg to 150 mmHg (0% to 20%)	
	AwRR	2 rpm to 150 rpm	
Resolution	$EtCO_2$	1 mmHg	
	$FiCO_2$	1 mmHg	
	AwRR	1 rpm	
Accuracy	$EtCO_2$	±2 mmHg, 0 mmHg to 40 mmHg	Typical conditions: Ambient temperature:(25±3)°C Barometric pressure:(760±10) mmHg Balance gas: N_2 Sample gas flowrate: 100ml/min
		±5% of reading, 41 mmHg to 70 mmHg	
		±8% of reading, 71 mmHg to 100 mmHg	
		±10% of reading, 101 mmHg to 150 mmHg	
		±12% of reading or ±4 mmHg, whichever is greater	All conditions
	AwRR	±1 rpm	
Sample Gas Flowrate	70 ml/min or 100 ml/min, accuracy: ±15 ml/min		
Warm-up time	Display waveform within 20 s Reach the design accuracy within 2 minutes.		
Response time	<4 s		
Barometric pressure compensation	Automatic		
Zero Calibration	Support		
Calibration	Support		
Apnea alarm delay	10 s, 15 s, 20 s, 25 s, 30 s, 35 s, 40 s, 60s		
Respironics Module			
Applicable Patient Type	Adult, Pediatric and Neonatal		
Method	Infra-red Absorption Technique		
Measure Parameters	$EtCO_2$, $FiCO_2$, AwRR		
Unit	mmHg, %, kPa		
Measuring Range	$EtCO_2$	0 mmHg to 150 mmHg	
	$FiCO_2$	3 mmHg to 50 mmHg	

Measuring Range	AwRR	2 rpm to 150 rpm (Sidestream) 0 rpm to 150 rpm (Mainstream)	
Resolution	$EtCO_2$	1 mmHg	
	$FiCO_2$	1 mmHg	
	AwRR	1 rpm	
Accuracy	$EtCO_2$	±2 mmHg, 0 mmHg to 40 mmHg	
		±5% of reading, 41 mmHg to 70 mmHg	
		±8% of reading, 71 mmHg to 100 mmHg	
		±10% of reading, 101 mmHg to 150 mmHg	
		±12% of reading, RR is over 80 rpm (Sidestream) There will be no degradation in performance due to respiration rate. (mainstream)	
	AwRR	±1 rpm	
Sample Gas Flow Rate (Sidestream)		50 ml /min ±10 ml /min	
Barometric Pressure Compensation		User setup	
CO_2 Rise Time/Response Time (Mainstream)		< 60 ms	
Sensor Response time (Sidestream)		<3 seconds - includes transport time and rise time	
Zero Calibration		Support	
Apnea Alarm Delay		10 s, 15 s, 20 s, 25 s, 30 s, 35 s, 40 s	
Safety Specifications			
Compliant with Standards		IEC 60601-1: 2005+A1 :2012; IEC 60601-1-2: 2014; EN 60601-1: 2006+A1 :2013; EN 60601-1-2: 2007; IEC 60601-2-49: 2011	
Anti-electroshock Type		Class I equipment and internal powered equipment	
Anti-electroshock Degree		CF	ECG (RESP), TEMP, IBP
		BF	SpO_2 , NIBP, CO_2
Ingress Protection		IPX1	
Environmental Specifications			
Temperature		Working	+0°C to +40°C (32ºF ~ 104ºF)
		Transport and Storage	-20°C to +55°C (-4ºF ~ 131ºF)
Humidity		Working	15%RH to 95%RH (non-condensing)
		Transport and Storage	15%RH to 95%RH (non-condensing)
Altitude		Working	86 kPa to 106 kPa
		Transport and Storage	70 kPa to 106 kPa

1) Quick TEMP module cannot be configured with CO_2 module at the same time.

** Specifications are subject to change without prior notice*

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