

# Specification: C 50



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# Patient Monitor

## C50



### Standard Configuration:

5-lead ECG, RESP, Temp(Single Channel),  
Comen SpO2, NIBP, HR

### Optional Configuration:

Dual-IBP, EtCO2, AG, C.O., Nellcor/Masimo SpO2, Dual-Temp,  
3/12-lead ECG, Thermal Recorder, Suntech NIBP, Trolley,  
Wall mount, Ground wire,

### Safety Standards:

IEC 60601-1 IEC 60601-1-8 IEC 60601-2-27 EN 1060-3 IEC 80601-  
2-30 IEC60601-2-34 IEC60601-2-49 ISO 80601-2-56 ISO 80601-2-  
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### Physical Characteristics:

Product Size: 291.7mm×146.5mm×250mm  
Weight: 3.3kg  
IP grade IPX1  
Display: 10.4" color TFT touch screen  
Resolution: 800\*600  
Trace: 8 waveforms

### Operation Environment:

working  
Temperature 5-40°C  
Humidity: ≤93%  
Power Supply 100-240V~, 50/60Hz±1Hz  
Battery Type: Rechargeable Lithium-ion battery  
Battery Capacity: 2200mAh (option: 4400mAh)  
Battery Recharging  
Time: Maximum 6 hours for charging;  
Battery backup: 2 hours for continuous working

### Indicator:

One alarm indicator  
Power indicator  
Battery indicator

QRS beep and alarm sound  
Operating key sound

### Interface:

Parameter cable interface  
AC power input  
USB port  
RJ45 port  
VGA output  
Multi-functional interface

### Data storage

Alarm Event Recall: 200 groups  
Wave Recall: 6 hours (8 waves)  
NIBP Recall: 2000 groups  
Trend Graph: 160 hours  
Trend Table: 160 hours  
Power-off storage: Yes  
Alarm: User-adjustable High and Low 3-level Limits;  
Prioritized audible and visual alarm  
Network: Connected to Central Monitoring System by hardwire/wireless

### Recorder:

Type: Built-in; Thermal array  
Channel: 3 channel waveforms  
Speed: 25mm/s, 50mm/s  
Record width: 50mm  
Real-time record time: 8s, 16s, 32s or continual  
Alarm record: Yes

## Respiration:

Method:	RA-LL Impedance Method
RR measurement range:	Adult: 0-120rpm Pediatric/Neonate:0-150rpm
Accuracy:	7~150rpm, $\pm 2$ rpm or 2%, whichever is greater; 0-6rpm unspecified
Resolution:	$\pm 1$ rpm
RESP Apnea	10s-60s(Adu); 10s-40s (Ped/Neo) Accuracy: 5s
Alarm:	Audible and visual alarm; alarm events reviewable
Sweep Speed:	6.25,12.5,25mm/s
Gain Selection:	X0.25, X0.5, X1, X2, X4

## ECG:

Lead Type:	CardioTec™5-leads ECG Analysis, 12-Lead and 3-leads selectable
Lead selection	12-Lead I; II; III; aVR; aVL; aVF; V1-V6. 5-lead: I; II; III; aVR; aVL;aVF; V 3-lead: I; II; III
Waveform	5-lead: 2 -channel 3-lead: 1 -channel
Gain Selection:	X0.125, X0.25, X0.5, X1, X2, X4, auto error $< \pm 5\%$
Sweep Speed:	6.25,12.5, 25, 50mm/s, error $\leq \pm 10\%$
Resp, lead disconnection detection and active noise control:	AC waveform: Current $< 0.1\mu\text{A}$ ; Frequency 64kHz, $\pm 10\%$
Heart Rate measurement	
Range:	Adult: 15~300bpm Pediatric/Neonate:15~350bpm
Accuracy:	$\pm 1\%$ or $\pm 1$ bpm (whichever is greater)
Protection:	Withstand 4000VAC/50Hz voltage in isolation, Again electrosurgical interference and defibrillation
Accuracy:	$\pm 1\%$ or $\pm 1$ bpm (whichever is greater)
Band width:	Monitoring Mode: 0.5-40Hz Diagnosis mode: 0.05-150Hz Surgery mode:1-20Hz ST mode: 0.05-40Hz

## ST SEGMENT

detection:	-2.0mV~+2.0mV (Automatic)
Arrhythmia	
Analysis:	26 types
Pacemaker detection:	Detectable
Alarm:	Yes, audible and visual alarm, alarm events reviewable
12 lead ECG	Yes
Analysis:	
<b>NIBP:</b>	
Method	Automatic oscillation
Work mode:	Manual / Automatic/Continual (5min, not applicable to neonates)
Measurement	
Time:	Adjustable (1-480min)
Measurement Unit:	mmHg / kPa selectable
Measurement types:	Systolic, Diastolic, Mean
Range of systolic pressure:	Adult Mode: 40-270mmHg Pediatric Mode: 40-200mmHg Neonate Mode: 40-135mmHg
Range of diastolic pressure:	Adult Mode: 10-215mmHg Pediatric Mode: 10-150mmHg Neonate Mode: 10-100mmHg
Range of mean pressure:	Adult Mode:20-235mmHg Pediatric Mode:20-165mmHg Neonate Mode 20-110mmHg
Static pressure range and accuracy:	0~300mmHg(0kPa~40.0kPa) $\pm 3$ mmHg( $\pm 0.4$ kPa)
Over-pressure protection:	Adult Mode: 297mmHg Pediatric Mode: 240mmHg Neonate Mode: 147mmHg Accuracy: $\pm 3$ mmHg
Initial pressure range(mmHg):	Adult: 80~240; Pediatric: 80~200; Neonate:60~120

Alarm: Systolic, Diastolic, Mean  
 PR from NIBP: Measurement & alarm range: 40-240bpm  
 Resolution: 1bpm  
 Accuracy:  $\pm 3$ bpm or  $\pm 3\%$ , whichever is greater

### Nellcor SpO<sub>2</sub>:

Measurement range: 0-100%  
 Alarm range: 20-100%  
 Resolution: 1%  
 Accuracy:  $\pm 2\%$  (70-100%, Adu/Ped, non-motion)  
 $\pm 3\%$  (70-100%, Neo, non-motion)  
 1-69% unspecified

PR Measurement  
 Range: 20-300bpm  
 Resolution: 1bpm  
 Accuracy:  $\pm 3$ bpm (20-250bpm);  
 Unspecified (251-300bpm)  
 Alarm Range: 20~300bpm

### Masimo SpO<sub>2</sub>:

Measurement & alarm range: 1~100%  
 Resolution: 1%  
 Accuracy:  $\pm 2\%$  (70-100%, Adu/Ped, non-motion)  
 $\pm 3\%$  (70-100%, Neo, non-motion)  
 1-69% unspecified

PR Measurement  
 Range: 25~240bpm  
 Resolution: 1bpm  
 Accuracy:  $\pm 3$ bpm (non-motion)  
 $\pm 5$ bpm (motion);  
 Alarm range: 25~240bpm  
 Perfusion index: 0.02~20%  
 Resolution: 0.01% (within 0.02%~9.99% range) or 0.1% (within 10.0%~20.0% range)

### Comen SpO<sub>2</sub>:

Measurement & alarm range: 0~100%  
 Resolution: 1%  
 Accuracy:  $\pm 2\%$  (70~100%, Adu/Ped, non-motion)  
 $\pm 3\%$  (70-100%, Neo, non-motion)  
 Unspecified (1-69%)

Data averaging and other signal

processing time: 2s  
 Data refresh rate: 8s  
 PR Measurement

Range: 20--254bpm  
 Resolution: 1bpm  
 Accuracy:  $\pm 2$ bpm  
 Alarm range: 20~254bpm  
 Perfusion index: 0.05%~20%  
 Resolution: 0.01% (within 0.05%~9.99% range) or 0.1% (within 10.0%~20.0% range)

### Temperature (Dual Channel)

Measurement & alarm range: 0-50°C  
 Sensor: Skin/rectal TEMP sensor  
 Resolution: 0.1°C  
 Accuracy:  $\pm 0.1^\circ\text{C}$  (exclusive of error of sensor)  
 Channel: T1, T2, TD (Temperature Difference)

### EtCO<sub>2</sub> (Sidestream)

Unit: mmHg, kPa  
 Measurement range: 0mmHg~150mmHg  
 Resolution: 1mmHg or 0.1kPa or 0.1%  
 Accuracy: 0mmHg ~40mmHg should be  $\pm 2$ mmHg;  
 41mmHg ~70mmHg should be  $\pm 5\%$ ×reading;  
 71mmHg ~100mmHg should be  $\pm 8\%$ ×reading;  
 101mmHg~150mmHg should be  $\pm 10\%$ ×reading

Oxygen compensation: 0~100 mmHg  
 Equilibrium gas: Helium, room air, nitrous oxide

### IBP

Channel: 4 Channels  
 Measured Pressure: ART, PA, CVP, RAP, LAP, ICP, LV, AO, UAP, BAP, FAP, UVP, IAP, P1, P2, P3, P4

Measurement range: ART: 0~300mmHg  
 PA: -6~120 mmHg  
 CVP: -10~40mmHg



	RAP: -10~40mmHg
	LAP: -10~40mmHg
	ICP: -10~40mmHg
	LV: 0~300mmHg
	AO: 0~300mmHg
	UAP: 0~300mmHg
	BAP: 0~300mmHg
	FAP: 0~300mmHg
	UVP: -10~ 40mmHg
	IAP: -10~40mmHg
	P1, P2, P3, P4: -50~300mmHg
Accuracy:	±2% or ±1mmHg (whichever is greater) 0.1kPa or 1mmHg
Resolution:	(-50mmHg~300mmHg)
Alarm Range:	-50mmHg~300mmHg
Pressure sensor:	Sensitivity: 5 V/V/mmHg Impedance range: 300~3000Ω
PR from IBP:	Measurement & alarm range: 20bpm~350bpm Resolution: 1bpm Accuracy: ±1bpm or ±1%, whichever is greater

## AG

### AG (complies with ISO 80601-2-55)

Method:	Infrared Radiation Absorption
	Characteristics
AG preheating time	<20s
Gas sorts:	CO2, N2O, DES, ISO, ENF, SEV, HAL, O2 (optional paramagnetic sensor)
Measurement range:	CO2: 0~15%: ±(0.2kPa+reading×2%), 15~25%: unspecified N2O: 0~100 %: ±(2kPa+reading×2%) HAL, ISO, ENF: 0~8%: ± (0.15%+reading×5%); 8~25vol%: unspecified SEV: 0~10%: ± (0.15%+reading×5%); 10~25vol %: unspecified DES: 0~22%: ± (0.15%+reading×5%); 22~25%: unspecified O2: 0-100%: ± (1%+reading×2%)
Data output:	Fi and Et values

AG resolution:	CO2: 1mmHg awRR: 1rpm
Accuracy:	For all measured values complies with EN ISO 21647:2004 and EN 864:1996
Alarm:	EtCO2: 0mmHg~190mmHg Fi CO2: 0mmHg~190mmHg AwRR: 2mmHg~150mmHg EtO2: 18% ~ 100% FiO2: 18% ~ 100% EtN2O: 0% ~ 100% FiN2O: 0% ~ 82% EtHal/EtEnf/EtIso/EtSev/EtDes: 0% ~ 25% FiHal/FiEnf/FiIso/FiSev/FiDes: 0% ~ 25%
Others:	Up to 4 waveforms displayed MAC value displayed

### ISATM (AG) Sidestream Gas Analyzer

Method:	Infrared gas measurement
No Breaths	
Timeout range	Adult: 10s, 15s, 20s, 25s, 30s, 35s, 40s, 45s, 50s, 55s or 1min; Pediatric and neonate: 20s, 25s, 30s, 35s or 40s Accuracy: ±5s
No Breath Alm	
Delay:	10s, 15s, 20s, 25s, 30s, 35s, 40s, 45s, 50s, 55s, 1min or Off
Working conditions:	ISA AX+: 0~50°C (32~122°F); ISA OR+: 5~50°C (41~122°F)
Storage conditions	-40~70°C (-40~158°F)
RH	<4kPa H2O (non-condensing) 95% RH, 30°C
Barometric pressure	52.5~120kPa (4572m)
Water treatment	Sampling tube: patented dehydration tube
Data output:	Fi and Et values
Waveform:	Display up to 4 gas concentration waveforms at a time
Diagnostic parameter:	Barometric pressure
ISA sensor:	2~9-channel NDIR gas analyzer (measurement range: 4~10µm)
Compensation:	CO2 broadening effect

Calibration	No calibration is required. The Monitor will auto perform zeroing when powered on and perform auto zeroing every 24h (ISACO2) or 8h (ISA AX+/OR+) subsequently.
Preheating time	ISA CO2: <10s; ISA OR+/AX+: < 20s
Rise time	CO2: $\leq$ 250ms; N2O: $\leq$ 350ms; anesthetic gases: $\leq$ 350ms; O2: $\leq$ 450ms
Overall system response time	<3s (2m sampling tube)
Respiration detection	Self-adaptive threshold (minimum CO2 concentration change: 1 vol%)
RR	0~150 breaths/min
Anesthetic gas threshold	Threshold of main anesthetic gases (ISA OR+/AX+): 0.15 vol%. The concentration of any identified anesthetic gas will be

reported, even if it is lower than 0.15 vol%

## Cardiac Output (C.O.)

Method:	Thermodilution
Measurement	
Range:	C.O.: 0.1~20L/min BT: 25~43°C IT: 0~25°C
Resolution:	C.O.: 0.1L/min BT, IT: 0.1°C
Accuracy:	C.O.: $\pm$ 5% or $\pm$ 0.1 L/min, whichever is greater BT, IT: $\pm$ 0.1°C (exclusive of sensor)
Alarm Range:	BT Hi limit: (LO limit +0.4)-43.0°C BT Lo limit: 25.0~(Hi limit-0.4) °C Step: 0.1°C

**\*Notice: Specifications subject to changes without prior notice. All rights reserved by Comen**