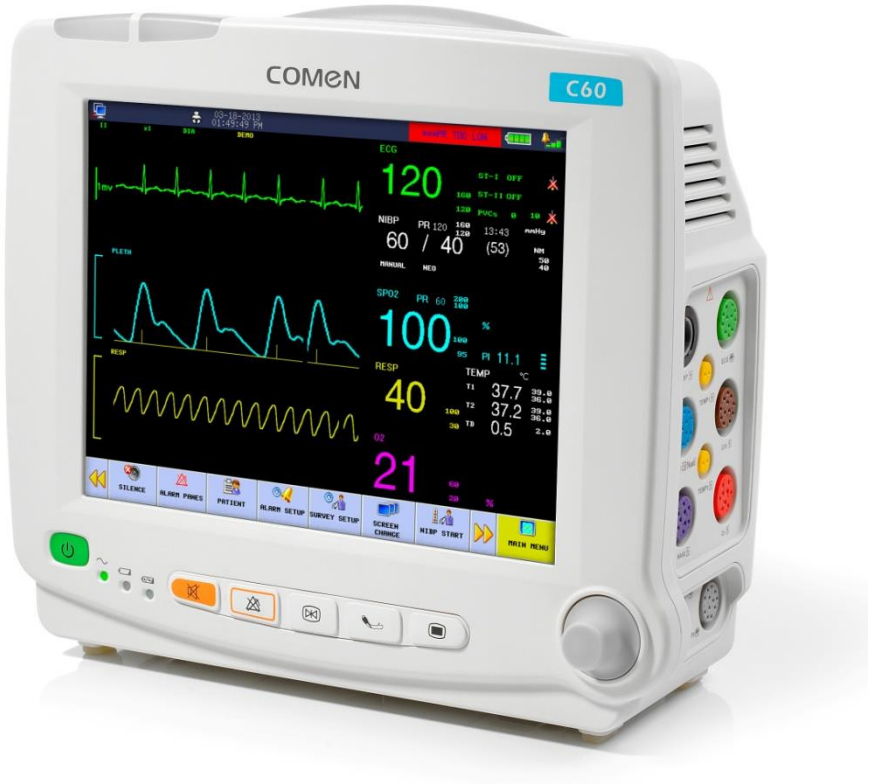
C60（C66C68）Product Specifications



1. Monitor Type

Classified by	Type
Electric shock protection type	Externally powered Class-I equipment, continuous operation equipment
Defibrillation-proof applied parts	defibrillation resistant equipment with internal power supply.
Electric shock protection level	Equipment with CF applied part (ECG, and IBP monitoring part) and BF applied parts (all other monitoring parts).
IP grade	IPX1
Work mode	Continuous operation equipment
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 80601-2-61

2. Monitor Specifications

1) Environmental Specifications

Item	Specification	
Working conditions	Ambient temperature	5°C~40°C

	RH	≤93%
	Barometric pressure	700hPa~1060hPa
Transport conditions	Please protect the monitor against violent impact, vibration, rain and snow in transport.Themonitor should be Transported in a well-ventilated room without corrosive gas (ambient temperature: -20 ℃ ~60 ℃ ; RH: ≤93%; Barometric pressure: 700hPa~1060hPa).	
Storage conditions	Themonitor should be packed and stored in a well-ventilated room without corrosive gas (ambient temperature: -20 ℃ ~60 ℃ ; RH: ≤93%;Barometric pressure: 700hPa~1060hPa).	

2) Power Supply

Item	Specification
AC input voltage	100-240V~
AC input frequency	50/60Hz
Power supply	Powered either by built-in battery or external AC.
Input power	50VA
Built-in battery	Standard: 11.1V ⎓ 2200mAh rechargeable lithium-ion battery, supplying power for at least 2 consecutive hours in normal use once fully charged.
Defibrillation Synchronization	output +5V defibrillation synchronization signal during 100ms
Analog Output	Bandwidth: 0.5-40Hz; Max delay: ≤35ms; error: ±5%;

3) General Specifications

Item	Specification
Size and weight	Size: 242mm×218mm×121mm
	Weight: 2.5kg
LCD specification	Size: 8.4 Inch Pixel :800×600
Display information	maximum 6 waveforms display

4) ECG Specifications

Name	Specifications
ECG should be subject to IEC 60601-2-27	
Range and accuracy of heart rate detection	Neonate:15～350bpm ±1% or ±1bpm (both maximum)
Upper and lower limits and	Neonate:

error of alarm	Upper limit: 17bpm～350bpm Lower limit:15bpm～348bpm Error of alarm should be setting value±1bpm
Heart rate alarm occurring time	≤10s
cardiac electrophysiology channel bandwidth	Monitoring mode: 0.5～40Hz; Diagnostic mode: 0.05～150Hz; Surgical mode: 1～20Hz. ST mode：0.05Hz～40Hz
Lead selection	Standard 3,5
Three Lead mode	RA, LA, LL, displaying I, II, III
Five Lead mode	RA, LA, LL, RL, V, displaying I, II, III, aVR, aVL, aVF, V
Electrode disconnection Indication	Automatic detection display
Scanning speed	6.25mm/s、12.5mm/s、25mm/s、50mm/s, error≤±10%
Gain selection	×0.125,×0.25, ×0.5 , ×1, ×2,×4 and auto, error<±5%
Cardiac Electrophysiology Noise level	≤25μVP-P.
ECG Common mode rejection ratio	Monitoring Mode：>105dB； Surgery mode：>105dB； Diagnosis mode：>90dB； ST mode: >105dB.
Cardiac Electrophysiology Input loop current	AC waveform: Current :<0.1μA; Frequency 64kHz, ±10%
Input impedance	≥5MΩ
Cardiac Electrophysiology common mode rejection ratio(CMRR) (10V RMS industrial frequency noise is allowed)	≤1mV
Time constant	Monitoring, surgical mode: ≥0.3s; Diagnosis mode: ≥3.2s.
Anti-interference	Anti-power frequency interference; anti endotherm knife interference; protection for defibrillator discharge

HR Calculation	
Tall T-wave rejection capability	1.2mV heart rate device will inhibit all QRS wave groups whose amplitudes are below 1.2mV,100ms ,and T wave whose intervals are 180ms and Q-T intervals 350ms
HR calculation	If all of the last 3 RR intervals are longer than 1200ms, the average of the last 4 RR intervals is the HR. In other cases, the average of the last 12 RR intervals (with the longest interval and shortest interval excluded) is the HR.
Cardiotachometer accuracy and response	HR is displayed as follows after the 20s stable segment: (bigeminy): 80±1bpm

to arrhythmia	(slowly varying bigeminy): 60±1bpm (quickly varying bigeminy): 120±1bpm (two-way contraction): 90±2bpm
Response time for HR changes	the response time for a HR change, whether from 80bpm to 120bpm or from 80bpm to 40bpm, is less than 10s.
Tachycardia alarm start time	The waveform: 1 - range: 10s 0.5 - range: 10s 2 - range: 10s 1 - range: 10s

5) Resp Specifications

Name	Specifications		
Way	Thoracic impedance method (RA-LL impedance method)		
Range and accuracy of measurement	Range of detection	neonate	0bpm-150bpm
	Accuracy	The measurement accuracy within 0~6rpm range is not defined. 7~150 rpm, ±2rpm or±2%	
Accuracy and error of preset alarm of respiration rate	neonate	upper limit	Lower limit+2rpm~150rpm
		lower limit	0~upper limit -2rpm
	Error	±1rpm	

6) SpO_2 Specifications

Name	Specifications
Displaying	Pulse waveform, SPO2
Display Resolution	1%
Data update time	2s
Data averaging and other signal processing time	8s
Upper and lower limit of alarm preset and accuracy	Masimo SPO2:Upper limit: lower limit+ 1%～100% Lower limit: 0%～upper limit -1% Nellcor SPO2: Upper limit: lower limit+ 1%～100% Lower limit: 20%～upper limit -1% Error of alarm should be setting value±1%
Range and accuracy	a) Masimo:measurement range is 1%~100%，with range of 70％～100％: measurement error should be±3% b) Nellcor:measurement range is 0%~100%，with range of 70％～100％: measurement error should be±3% (No state of motion)
Preset of alarm and accuracy	Masimo:measurement range is 1%~100% Nellcor:measurement range is 0%~100% Error of alarm should be setting value±1%

7) PR Specifications

Item	Specification
Measurement range and accuracy	◆ Masimo SpO_2 sensor: Measurement range: 25bpm~240bpm; resolution: 1bpm; measurement error: ±3bpm (in non-motion state) or ±5bpm (in motion state). ◆ Nellcor SpO_2 sensor: Measurement range: 20bpm~300bpm; resolution: 1bpm; measurement error: ±3bpm within 20bpm~250bpm range. The measurement accuracy within 251bpm~300bpm range is not defined. ◆ NIBP sensor: Measurement range: 40bpm~240bpm; resolution: 1bpm; measurement error: ±3bpm or ±3%, whichever is greater. ◆ IBP sensor: Measurement range: 20bpm~350bpm; resolution: 1bpm; measurement error within 20bpm~350bpm range: ±1bpm or ±1%, whichever is greater (excluding the sensor error).
PR alarm limit range and accuracy	20bpm~350bmp ±1bpm

8) Temp Specifications

Name	Specifications	
Measurement range and accuracy	Detection range	0℃～50℃
	Measurement error	±0.1℃
Alarm setting and accuracy	Alarm setting range	Upper limit : lower limit+0.1℃～50.0℃ Lower limit :0℃～upper limit -0.1℃
	Alarm error	±0.1℃
Display Resolution	0.1°C	
Channel	Two-channel	
Operating mode	Direct mode	
Transient response	No greater than 40 seconds	

9) CO_2 Specifications

Item	Specification	
The $EtCO_2$ sensor complies with ISO 80601-2-55.		
Masimo $EtCO_2$ sensor (mainstream)		**Masimo $EtCO_2$ sensor (sidestream)**
CO_2 measurement range	0mmHg~190mmHg, 0~25% (at 760mmHg)	0mmHg~190mmHg, 0~25% (at 760mmHg)
CO_2 resolution	1mmHg, 0.1kPa or 0.1%	1mmHg, 0.1kPa or 0.1%

CO_2 accuracy	0~15%: ±(0.2%+reading×2%) 15~25%: not defined	0~15%: ±(0.2%+reading×2%) 15~25%: not defined
CO_2 alarm limit range	0~190mmHg	0~190mmHg
CO_2 alarm resolution	±0.1kPa or ±1mmHg	±0.1kPa or ±1mmHg
awRR measurement range	0~150rpm	0~150rpm
awRR measurement accuracy	±1rpm	±1rpm
awRR alarm limit range	0rpm~150rpm	0rpm~150rpm
awRR alarm resolution	1rmp	1rmp
No breath alarm limit range and error	Range	neonate: 20s、25s、30s、35s、40s
	Error	±5s
No breathalarm delay	10s、15s、20s、25s、30s、35s、40s、45s、50s、55s、1min、Off	
Respironics/Nmed/Palconn $EtCO_2$ sensor (mainstream)		**Respironics/Nmed/Palconn $EtCO_2$ sensor (sidestream)**
CO_2 measurement range	0~150mmHg 0%~19.7% (0~20.0kPa)	0~150mmHg 0%~19.7% (0~20.0kPa)
CO_2 resolution	0~69mmHg: 0.1mmHg 70~150mmHg: 0.25mmHg	0~69mmHg: 0.1mmHg 70~150mmHg: 0.25mmHg
CO_2 accuracy	0~40mmHg: ±2mmHg 41~70mmHg: ±5%×reading 71~100mmHg: ±8%×reading 101~150mmHg: ±10%×reading	0~40mmHg: ±2mmHg 41~70mmHg: ±5%×reading 71~100mmHg: ±8%×reading 101~150mmHg: ±10%×reading
CO_2 alarm limit range	0~150mmHg	0~150mmHg
CO_2 alarm resolution	±0.1kPa or ±1mmHg	±0.1kPa or ±1mmHg
awRR measurement range	0~150rpm	0~150rpm
awRR measurement accuracy	±1rpm	±1rpm
awRR alarm limit range	0~150rpm	0~150rpm
awRR alarm resolution	1rmp	1rmp

No breath alarm limit range and error	Range	neonate: 10s、15s、20s、25s、30s、35s、40s
	Error	±5s
No breathalarm delay	10s、15s、20s、25s、30s、35s、40s、45s、50s、55s、1min、Off	

10) O2 sensor specifications

Name	Specifications
Measurement range and accurancy	0~100%, accurancy ±1%
Upper and lower limit of alarm and resolution	Upper limit:lower limit+2%~100% Lower limit:0%~Upper limit-2% Resolution: ±1%
Respondence time	<15s

11) NIBP Specifications

Name	Specifications		
The NIBP sensor complies with IEC 80601-6-30.			
Measuring mode	Automatic oscillation		
Measuring parameter	systolic pressure, diastolic pressure, mean arterial pressure		
Working mode	Manual, auto and continuous		
Cycle time of auto measuring	1~480 mins		
Measurement range	Measurement range for neonate	Systolic blood pressure	5.3 kPa -18kPa（40-135mmHg）
		Diastolic blood pressure	1.3 kPa -13.3kPa（10-100mmHg）
		Mean blood pressure	2.7 kPa -14.7kPa（20-110mmHg）
Range and accuracy of static pressure	Scope:	Should be 0mmHg～300mmHg。	
	accuracy	Should be□±3mmHg	
Overpressure Protection	Neonate mode	150mmHg	
	tolerance	±3mmHg	
Alarm range	Neonate	systolic pressure	5.3kPa~18kPa (40mmHg~135mmHg) Upper limit: 5.6kPa~18kPa（42mmHg~135mmHg） Lower limit: 5.3kPa~17.7kPa（40mmHg~133mmHg）
		diastolic pressure	1.3kPa~13.3kPa (10 mmHg~100mmHg) Upper limit: 1.6kPa~13.3kPa（12 mmHg~100mmHg） Lower limit: 1.3kPa~13.1kPa（10 mmHg~98mmHg）
		mean	2.7kPa~14.7kPa (20mmHg~110mmHg)

		pressure	Upper limit: 2.9kPa~14.7kPa (22mmHg~110mmHg) Lower limit: 2.6kPa~14.4kPa (20 mmHg~108mmHg）
	Error		±0.1kPa or±1mmHg (Both maximum)
NIBP measurement recall	2000 NIBP measurement data		

12) IBP Specifications

Item	Specification	
Number of IBP channels	2	
Pressure name	ART (arterial pressure), PA (pulmonary artery pressure), CVP (central venous pressure), RAP (right atrial pressure), LAP (left atrial pressure), ICP (Intracranial pressure), AO (aortic pressure), UAP (umbilical artery pressure), BAP (brachial artery pressure), FAP (femoral artery pressure), UVP (umbilical venous pressure), LV (left ventricular pressure), P1, P2, P3 and P4..	
Measurement range and accuracy	ART	0~40kPa (0~300mmHg)
	PA	-0.8~16kPa (-6~120mmhg)
	CVP	-1.3~5.3kPa (-10~40mmHg)
	RAP	-1.3~5.3kPa (-10~40mmHg)
	LAP	-1.3~5.3kPa (-10~40mmHg)
	ICP	-1.3~5.3kPa (-10~40mmHg)
	P1, P2	-6.6~40kPa (-50~300mmHg)
	P3, P4	-6.6~40kPa (-50~300mmHg)
	LV	0~40kPa (0~300mmHg)
	AO	0~40kPa (0~300mmHg)
	UAP	0~40kPa (0~300mmHg)
	BAP	0~40kPa (0~300mmHg)
	FAP	0~40kPa (0~300mmHg)
	UVP	-1.3~5.3kPa (-10~40mmHg)
	IAP	-1.3~5.3kPa (-10~40mmHg)
Static pressure measurement range	-1.3kPa~+40kPa(-50mmHg~+300mmHg)	
Display resolution for static pressure measurement	0.1kPa or 1mmHg	
Static pressure measurement error	±1mmHg or ±2%, whichever is greater (excluding the sensor error).	
IBP alarm limit range (SYS, DIA, MAP)	ART	0mmHg -300mmHg
	PA	-6mmHg~120mmHg

	CVP	-10mmHg~40mmHg
	RAP	-10mmHg~40mmHg
	LAP	-10mmHg~40mmHg
	ICP	-10mmHg~40mmHg
	P1	-50mmHg~300mmHg
	P2	-50mmHg~300mmHg
	P3	-50mmHg~300mmHg
	P4	-50mmHg~300mmHg
	LV	0mmHg~300mmHg
	AO	0mmHg~300mmHg
	UAP	0mmHg~300mmHg
	BAP	0mmHg~300mmHg
	FAP	0mmHg~300mmHg
	UVP	-10mmHg~40mmHg
	IAP	-10mmHg~40mmHg
IBP alarm error	±0.1kPa or ±1mmHg	
Pressure sensor	Sensitivity: 5μV/V/mmHg	
	Impedance range: 300~3000Ω	
Pressurezerocalibration	Each channel should feature a pressure zero calibration function, with an accuracy of ± 1mmHg or ± 0.1kPa.）	

13) Wake specification

Name	Specifications
Measuring range	RESP, CO2, SpO2 and HR
Trigger condition	RESP<7bmp, CO2<7 mmHg, SpO2 <85% (default) or HR<100(default)
Stimulus mode	Beater vibration
Stimulus strength	15000± 800 rpm
Stimulus frequency	5s (Stimulate for 3s and stop for 2s)
Response time	0-20s

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