

# Specification: S5



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# Defibrillator/ Monitor

## S5



### Standard Configuration:

Manual defibrillation, AED, 3/5-lead ECG, RESP, Thermal Recorder

### Optional:

Pacer, NIBP, PR, EtCO<sub>2</sub>, SpO<sub>2</sub>

### Safety Standards:

### Physical Characteristics

Size:	295mm×252mm×316mm
Weight	5.2kg (Including 1 battery)
Screen Size:	7" TFT screen
Resolution	800 × 480
Waveforms:	Max 4 waveforms

### Operation Environment

Temperature:	0~45°C
Humidity:	10%~95%, non-condensation
Atmosphere Pressure:	700hPa~1060hPa
Ingress Protection:	IP44
Power requirement:	100-240V~, 50/60Hz±3Hz
Battery type:	Rechargeable Lithium-ion battery
Battery capacity:	7500mAh, d.c.14.8V 5000mAh, d.c.14.8V
Battery number:	1
Battery recharging Time:	7500mAh Battery: Less than 2 hours to 80% and less than 3 hours to 100% with equipment power off 5000mAh Battery: Less than 1.5 hours to 80% and less than 2.5 hours to 100% with equipment power off
Battery backup:	7500mAh Battery: Monitoring Mode: no less than 6 hours Defib Mode: 210 times (360J charge at intervals of 1minute without recording);

Pacing Mode: 4.5 hours (Load:50 Ω , frequency: 80bpm, current: 60mA, without recording)

5000mAh Battery:

Monitoring Mode: no less than 4 hours

Defib Mode: 120times (360J charge at intervals of 1minute without recording);

Pacing Mode: 3hours (Load:50 Ω , frequency: 80bpm, current: 60mA, without recording)

Manual from X to 100, X refers to the darkest brightness (X is 10 by default)

Brightness:

### Indicator

Two alarm indicators  
Power indicator  
Battery indicator  
Maintain indicator  
QRS beep and alarm sound  
Operating key sound

### Interfacing

USB interface  
RJ45 interface  
AC power input  
Multi-functional connector

### Date storage

Alarm Event:	200 groups
Patient profiles:	100 groups
Patient Events:	1000 groups
Wave Review:	10min
NIBP Review:	2000 groups
Trend Graph:	160 hours
Trend Table:	160 hours
Voice recording:	Max 240 min in total;

Marked events	(Up to 60 min for each patient) Available
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:	Max 3 channel waveforms
Real-time recording:	3s, 5s, 8s, 16s, 32s, Continual
Speed:	6.25mm/s, 12.5mm/s, 25mm/s, 50mm/s
Record width:	50mm
Resolution:	8dot/mm (Horizontal and vertical)
Background grid:	Configurable
External printer:	Yes

### Defibrillation

Operating mode:	Manual Mode, AED Mode, , Synchronous Defibrillation
Waveform:	Biphasic truncated exponential waveform, with impedance compensation
Defibrillation pathway:	External defibrillation
Electrode type:	External defibrillation paddles, multifunctional electrode
External defibrillation electrode paddles:	Supports charging, discharging and energy selection; Charging completion indicator
Charge Time: (Battery power)	Less than 3 seconds to 200 Joules with a new, fully charged battery Less than 7 seconds to 360 Joules with a new, fully charged battery
Charge Time: (AC power)	Less than 4 seconds to 200 Joules; Less than 8 seconds to 360 Joules
Energy accuracy:	±1.5J or ±10% of setting, whichever is greater, while 50 Ω impedance ±2J or 15% of setting, whichever is greater, while 25 Ω, 75 Ω, 100 Ω, 125 Ω, 150 Ω, 175 Ω impedance
Patient Impedance Range:	20~300 Ω (External defibrillation);

Defibrillation proof:	Type CF: ECG, RESP, SpO <sub>2</sub> , NIBP, PR; Type BF: EtCO <sub>2</sub>
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### Manual Mode

External defibrillators:	1J~360J, 25 types (1/2/3/4/5/6/7/8/9/10/15/20/30/50/70/100/120/150/170/200/220/250/270/300/360J)
Synchronous Cardioversion:	Energy transfer begins within 60ms of the R wave from internal Sync signal Energy transfer begins within 25ms of the External Sync signal

### AED

Output Energy:	Adjustable: 100-360J
Number of electric shocks	Adjustable: once, twice, 3 times
Types can be AED:	VF & VT
AED maximum time required for cardiac rhythm analysis to be ready for discharge:	Battery power supply: 18s AC power supply: 21s

### Noninvasive Pacing

Waveform:	Monophasic square wave pulse
Pulse Width:	20ms or 40ms
Accuracy:	±5%
Pacing Mode:	On-demand or fixed
Pacing frequency:	30 ppm to 210 ppm
Accuracy:	±1ppm or ±1.5% (whichever is greater)
Pacing output:	0 mA to 200 mA
Accuracy:	±5% or ±5mA, whichever is greater
Speed-down pacing:	Pacing pulse frequency reduced to 25% of original value.

### Monitoring

#### ECG (leads)

Lead Type:	3 leads ECG, 5 leads ECG, AUTO
Lead selection:	5-lead: I; II; III; aVR; aVL; aVF; V 3-lead: I; II; III
Multi-lead synchronization analysis:	Available
ECG sensitivity:	Auto, 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),

Accuracy:	Less than $\pm 5\%$	ST analysis review	Others: Unspecified
Sweep speed:	6.25 mm/s, 12.5 mm/s, 25 mm/s, 50 mm/s	System noise:	20 groups
Accuracy:	Less than $\pm 10\%$	Calibration voltage	Less than 25 $\mu$ V
Heart Rate:	Adult: 15~300bpm Pediatric: 15~350bpm Accuracy: $\pm 1$ bpm or $\pm 1\%$ (whichever is greater)	Arrhythmia Analysis:	1 mV; Accuracy: $\pm 5\%$ 26 Types
Alarm limit range	Adult: High limit: (low limit+2bpm) ~ 300bpm Low limit: 15bpm~ (high limit-2bpm) Pediatric: High limit:(low limit+2bpm) ~ 350bpm Low limit: 15bpm~(high limit-2bpm)	Pacemaker detection:	Detectable
Resolution:	1 bpm	<b>ECG (paddle)</b>	
Accuracy:	$\pm 1$ bpm	Lead Type:	Single lead ECG
Bandwidth:	Monitoring: 0.5~40Hz (-3.0dB~+0.4dB) Diagnosis: 0.05~150Hz (-3.0dB~+0.4dB) Surgery: 1~20Hz (-3.0dB~+0.4dB) ST: 0.05~40Hz(-3.0dB~+0.4dB)	Heart Rate measurement & alarm range:	Adult: 15~300bpm Pediatric: 15~350bpm
CMRR:	Monitoring: $> 105$ dB Diagnosis: $> 90$ dB Surgery: $> 105$ dB ST: $> 105$ dB	Resolution:	1 bpm
Input Impedance:	$\geq 5$ M $\Omega$	Accuracy:	$\pm 1\%$ or $\pm 1$ bpm (whichever is greater)
Input signal range:	$\pm 8$ mV	Bandwidth:	Defib: 1~20Hz (-3dB~+0.4dB)
HR trigger threshold	200 $\mu$ V	CMRR:	Defib: $> 105$ dB
Lead off detection current:	Measuring electrode: $< 0.1\mu$ V Driving electrode: $< 1\mu$ V	Input Impedance:	$\geq 5$ M $\Omega$
Pacemaker pulse suppression switch:	Manual selection when the pacemaker is turned on	Input signal range:	$\pm 8$ mV
Analog output:	Magnification: 1:1000; Accuracy: $\pm 5\%$ Bandwidth: 0.5Hz~40Hz Delay: $\leq 35$ ms	HR trigger value	200 $\mu$ V
ST Detection:	-2.0mV~+2.0mV (-20.0mm~+20.0mm)	Arrhythmia Analysis:	5 Types, ASY, VF, VT, PNC, and PNP
Resolution:	0.01mV	<b>Respiration</b>	
Accuracy:	-0.8mV ~ +0.8mV: $\pm 0.02$ mV or $\pm 10\%$ ;	Method:	Thoracic Impedance Method
		RR measurement range:	Adult: 0~120bpm Pediatric: 0 ~150bpm
		Accuracy:	7~150bpm: $\pm 2$ bpm or $\pm 2\%$ (whichever is greater) 0~6bpm: unspecified
		Apnea Alarm:	Adult: 10s~60s Ped: 10s~40s
		Accuracy:	$\pm 5$ s
		Alarm:	Audible and visual alarm; alarm events reviewable
		<b>COMEN NIBP</b>	
		Method	Automatic oscillometric
		Work mode:	Manual / Automatic/Continuous
		Interval Time:	Adjustable 1/2/2.5/3/4/5/10/15/30/60/90/120/180/240/480/720 min Continuous: 5min
		Maximum measurement cycle	Adu/Ped: 120s
		Measurement Unit:	mmHg / kPa selectable
		Pressure types:	Systolic, Diastolic, Mean
		Range of systolic pressure:	Adult Mode: 5.3~36kPa (40~270mmHg) Pediatric Mode: 5.3~26.7kPa (40~200mmHg)

Range of diastolic pressure: Adult Mode: 1.3~28.7kPa (10~215mmHg)  
Pediatric Mode: 1.3~20kPa (10~150mmHg)

Range of mean pressure: Adult Mode: 2.7~31.3kPa (20~235mmHg)  
Pediatric Mode: 2.7~22kPa (20~165mmHg)

Over pressure protection: Adult: 39.6kPa (297mmHg)  
Pediatric: 32kPa (240mmHg)  
Tolerance:  $\pm 0.4$ kPa ( $\pm 3$ mmHg)

Accuracy:  $\pm \pm 0.667$ kPa ( $\pm 5$ mmHg), if exceeds the above range, the monitor can still display normally, but the accuracy is not considered

Alarm limit: Same as the range of measurement  
PR from NIBP: 40~240bpm  
Resolution: 1bpm  
Accuracy:  $\pm 3\%$  or  $\pm 3$ bpm, whichever is greater

## SunTech NIBP

Regulatory compliance: YY 0670-2008

Initial inflation range: Adult: 16~37.3kPa (120~280mmHg)  
Pediatric: 10.7~22.7kPa (80~170mmHg)

Maximum measurement cycle: Adult: 130s  
Pediatric: 90s

Over pressure protection: Adult/Pediatric: 40.0kPa (300mmHg)

Static pressure measurement range: 0kPa~40.0kPa (0mmHg~300mmHg)

Resolution:  $\pm 0.4$ kPa ( $\pm 3$ mmHg)

Range of systolic pressure: Adult: 5.3~34.7kPa (40~260mmHg)  
Pediatric: 5.3~21.3kPa (40~160mmHg)

Range of diastolic pressure: Adult: 2.7~26.7kPa (20~200mmHg)  
Pediatric: 2.7~16kPa (20~120mmHg)

Range of mean pressure: Adult: 3.5~29.3kPa (26~220mmHg)  
Pediatric: 3.5~17.7kPa (26~133mmHg)

PR from NIBP: 30~220bpm

Accuracy:  $\pm 2\%$  or  $\pm 3$ bpm, whichever is greater

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

Measurement range: 0~100%

Resolution: 1%

Accuracy:  $\pm 2\%$  (70~100%, Adu/Ped, non-motion)  
1~69% unspecified

Alarm range: 20~100%

PR Measurement Range: 20~300bpm

Resolution: 1bpm

Accuracy:  $\pm 3$ bpm (20~250bpm)  
Unspecified (251~300bpm)

Alarm range: 20~350bpm

## MASIMO SpO<sub>2</sub>

Measurement & alarm range: 1~100%

Resolution: 1%

Accuracy:  $\pm 2\%$  (70~100%, Ped/Adu, non-motion)  
 $\pm 3\%$  (70~100%, motion);  
1~69% unspecified

Alarm range: 1~100%

PR Measurement Range: 25~240bpm

Resolution: 1bpm

Accuracy:  $\pm 3$ bpm (non-motion)  
 $\pm 5$ bpm (motion);

Alarm range: 20~350bpm

PI value: 0.02~20%

Resolution: 0.01% (0.02~9.99%)  
0.1% (10~20%)

SIQ: Available

## COMEN SpO<sub>2</sub>

Measurement & alarm range: 0~100%

Resolution: 1%

Accuracy:  $\pm 2\%$  (70~100%, Ped/Adu, non-motion)  
0~69% unspecified

PR Measurement Range: 20~254bpm

Resolution: 1bpm

Accuracy:  $\pm 2$ bpm

Alarm range:	20~350bpm		± 5% of reading (41 – 70mmHg)
PI value:	0.05~20%		± 8% of reading (71 –100mmHg)
Resolution:	0.01% (0.05%~9.99%)		± 10% of reading (101~150mmHg)
	0.1% (10.0%~20.0%)		(In 25℃, if RR > 80rpm, accuracy is
Accuracy:	unspecified		12% of reading)
SIQ:	Available		CapnoTrak:
<b>MASIMO EtCO<sub>2</sub> (Sidestream)</b>			
Measurement range:	0~190mmHg, 0~25vol% (at 760mmHg)		± 2mmHg (0~38mmHg)
			± 10% of reading (38~99mmHg)
Accuracy:	Standard environment 22±5℃, 1013±40kPa:		RR influence to EtCO <sub>2</sub> (0~99mmHg):
	a) 0~114mmHg:		-2~0.5mmHg (0-40bpm)
	± (1.52mmHg+reading×2%)		(-6% of reading)~0.5mmHg (41-
	b) 114~190mmHg: not defined		70bpm)
	All environment:		(-14% of reading)~0.5mmHg
	a) 0~114mmHg:	Resolution:	(71~100bpm)
	± (2.25mmHg+reading×4%)		1mmHg
	b) 114~190mmHg: not defined	awRR range	Loflow: 2~150rpm
Resolution:	1mmHg or 0.1% or 0.1kPa	awRR accuracy:	CapnoTrak: 0, 2~100rpm
awRR range:	0~150rpm		±1rpm
awRR accuracy:	±1rpm		
Response time:	<3 s		

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

Measurement range:	Loflow:
	0~150mmHg, 0~19.7%, (0~20kPa)
	(at 760mmHg)
	CapnoTrak:
	0~99mmHg, 0~13.03%, 0~13.2kPa
	(at 760mmHg)
Accuracy:	Loflow:
	± 2mmHg (0~40mmHg)

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