

# COMeN

All for the End Users



Technical specification for Defibrillator Monitor V2.1

# S5

## Defibrillator Monitor S5

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### Standard Configuration

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

### Optional

NIBP, PR, SpO2, EtCO2(Specific parameters refer to CO2 module parameter table)

### Physical Characteristics

Dimension	295mm×252mm×316mm (L×W×H)
Weight	5.6kg (Including 1 battery); 5.384(Main unit)
Screen Size	7" TFT screen
Resolution	800 × 480 pixels
Waveforms Display	Max 4 waveforms

### Operation Environment

Temperature	0~45°C
Humidity	10%~95%, non-condensing
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:50Ω, 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:50Ω, frequency: 80bpm, current: 60mA, without recording)
Brightness	Manual from X to 100, X refers to the lowest brightness (X is 10 by default)

## Indicator

Two alarm indicators

Power indicator

Battery indicator

Maintenance indicator

QRS beep and alarm sound

Operating key sound

## Interfacing

USB interface

RJ45 interface

AC power input

Multi-functional connector

## Data Storage

Alarm Event	200 groups
Patient profiles	100 groups
Patient Events	1000 groups
Wave Review	16.6 hours
NIBP Review	2000 groups
Trend Graph	160 hours
Trend Table	160 hours
Voice recording	Max 240 min in total; (Up to 60 min for each patient)
Marked events	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	Not supported

## 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	$\pm 1.5\text{J}$ or $\pm 10\%$ of setting, whichever is greater, while $50\Omega$ impedance $\pm 2\text{J}$ or $15\%$ of setting, whichever is greater, while $25\Omega$ , $75\Omega$ , $100\Omega$ , $125\Omega$ , $150\Omega$ , $175\Omega$ impedance
Patient Impedance Range	$20\sim 300\Omega$ (External defibrillation);
Defibrillation proof	Type CF: ECG, RESP, SpO <sub>2</sub> , NIBP, PR; Type BF: EtCO <sub>2</sub>

## 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)
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## 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:	Adujustable: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 Refractory period: 350 ms (30 to 90 ppm; 240 ms (100 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.

## 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 wave gain	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 ±5%
Sweep speed	6.25 mm/s, 12.5 mm/s, 25 mm/s, 50 mm/s
Accuracy	Less than ±10%
Heart Rate	Adult: 15~300bpm Pediatric: 15~350bpm
Accuracy	±1bpm or ±1% whichever is greater
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)
Resolution	1bpm
Accuracy	±1bpm
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)
CMRR	Monitoring: >105dB Diagnosis: >90dB Surgery: >105dB ST: >105dB
Input Impedance	≥5MΩ
Input signal range	±8mV
HR trigger threshold	200μV
Lead off detection current	Measuring electrode: <0.1μV Driving electrode: <1μV
Pacemaker pulse suppression switch	Manual selection when the pacemaker is turned on
Analog output	Magnification: 1:1000
Accuracy	±5%
Bandwidth	0.5Hz~40Hz
Delay	≤35ms
ST Detection	-2.0mV~+2.0mV (-20.0mm~+20.0mm)

Resolution	0.01mV;
Accuracy	-0.8mV ~ +0.8mV: $\pm 0.02\text{mV}$ or $\pm 10\%$ ; Others: Unspecified
ST analysis review	20 groups
System noise	Less than $25\mu\text{V}$
Calibration voltage	1 mV
Accuracy	5%
Arrhythmia Analysis	26 Types
Pacemaker detection	Detectable

### ECG (Paddle)

Lead Type	Single lead ECG
Heart Rate measurement & alarm range	Adult: 15~300bpm Pediatric: 15~350bpm
Resolution	1 bpm;
Accuracy	$\pm 1\text{bpm}$ or $\pm 1\%$ whichever is greater
Bandwidth	Defib: 1~20Hz (-3dB~+0.4dB)
CMRR	Defib: $> 106\text{dB}$
Input Impedance	$\geq 5\text{M}\Omega$
Input signal range	$\pm 8\text{mV}$
HR trigger value	$200\mu\text{V}$
Arrhythmia Analysis	5 Types, ASY, VF, VT, PNC, and PNP

### Respiration

Method:	Thoracic Impedance Method
RR measurement range	Adult: 0~120bpm Pediatric: 0 ~150bpm
Accuracy	7~150bpm: $\pm 2\text{bpm}$ or $\pm 2\%$ (whichever is greater) 0~6bpm: unspecified
Apnea Alarm	Adult: 10s~60s Ped: 10s~40s
Accuracy	$\pm 5\text{s}$
Resolution	1 bpm

Alarm Audible and visual alarm; alarm events reviewable

### COMEN NIBP

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 Neo: 85s
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	$\pm 0.667$ 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 Neonate: 75s
Over pressure protection	Adult/Pediatric: 40.0kPa (300mmHg)

Static pressure measurement range:	0kPa~40.0kPa (0mmHg~300mmHg)
Resolution	±0.4kPa (±3mmHg)
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	±2% or ±3bpm, whichever is greater

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

Measurement range	0~100%
Resolution	1%;
Accuracy	±2% 70~100%, Adu/Ped, non- motion 1~69% unspecified
Alarm range	20~100%
PR Measurement Range	20~300bpm
Resolution	1%
Accuracy	±2% 1bpm ±3bpm (20~250bpm) Unspecified (251~300bpm)
Alarm range:	20~350bpm.....

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

Measurement & alarm range	1~100%
Resolution	1%;
Accuracy	±2% 70~100%, Ped/Adu, non-motion ±3% 70~100%, motion 1~69% unspecified
Alarm range	1~100%
PR Measurement Range	25~240bpm
Resolution	1bpm
Accuracy	±3bpm non-motion, ±5bpm 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	±2% 70~100%, Ped/Adu, non-motion ±3% 70~100%, motion 0~69% unspecified
PR Measurement Range	20~254bpm
Resolution	1bpm
Accuracy	±2bpm
Alarm range	20~350bpm
PI value	0.05~20%
Resolution	0.01% (0.05%~9.99%) 0.1% (10.0%~20.0%)
Accuracy	unspecified
SIQ	Available

### Comen/Respironics Mainstream EtCO<sub>2</sub>

Rise time	<60ms
Sweep speed	6.25mm/s
CO <sub>2</sub> range	0mmHg~150mmHg
CO <sub>2</sub> resolution	1mmHg or 0.1kPa or 0.1%
CO <sub>2</sub> accuracy	0mmHg ~40mmHg should be±2mmHg 41mmHg ~70mmHg should be±5% 71mmHg ~100mmHg should be±8% 101mmHg~150mmHg should be±10%
awRR range	0 to 150rpm
awRR Accuracy	±1rpm
sample rate	50ml/min
Accuracy	±10 ml/min

### Masimo Mainstream EtCO<sub>2</sub>

CO <sub>2</sub> range	0mmHg~190mmHg, 0vol%~ 25vol% (at 760mmHg)
CO <sub>2</sub> Accuracy	0mmHg ~114mmHg ,± (1.52 mmHg +2% of reading)

	114mmHg ~190mmHg, Undefined
awRR range	0rpm~150rpm
awRR Accuracy	±1rpm

### Masimo Sidestream EtCO<sub>2</sub>

Measurement range:	0~190mmHg, 0~25vol% (at 760mmHg)
Accuracy:	Standard environment 22±5°C, 1013±40kPa: a) 0~114mmHg: ±(1.52mmHg+reading×2%) b) 114~190mmHg: not defined All environment: a) 0~114mmHg: ±(2.25mmHg+reading×4%) 114~190mmHg: not defined
Resolution:	1mmHg or 0.1% or 0.1kPa
awRR range:	0~150rpm
awRR accuracy:	±1rpm
Response time:	<3 s

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

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) ± 5% of reading (41 – 70mmHg) ± 8% of reading (71 –100mmHg) ±10% of reading (101~150mmHg) (In 25°C, if RR > 80rpm, accuracy is 12% of reading) CapnoTrak: ±2mmHg (0~38mmHg) ±10% of reading (38~99mmHg) RR influence to EtCO <sub>2</sub> (0~99mmHg): -2~0.5mmHg (0-40bpm) (-6% of reading)~0.5mmHg (41-70bpm) (-14% of reading)~0.5mmHg (71~100bpm)
Resolution	1mmHg
awRR range	Loflow: 2~150rpm

awRR accuracy

CapnoTrak: 0, 2~100rpm

±1rpm

Specifications, design, and accessories are subject to change without any notice or obligation on the part of the manufacturer.