esaote 3

ESQ7

Modular Patient Monitor

INTENSIVE CARES

ESQ7

TECHNICAL SPECIFICATION: ESQ7

ESQ7 Main Unit

Size and Weight

- Size: 335mmX366mmX172mm
- Weight : ≤ 6 kg
- Standard module slot: 3

Power supply

- Power Voltage: AC 100-240V 50/60Hz
- Input Current: 1.7~0.8A
- Safety class: Category I

Display

- 15" Color TFT-LCD
- Resolution : 768 × 1024 pixels

Battery

- Type: Rechargeable Lithium battery, 11.1V/4.0AH
- Operating time under the normal use and full charge : ≥120minutes (2 batteries for 240 minutes)

Recorder (Option)

- Method : Thermal dot array
- Paper width : 50 mm (1.97 in)
- Paper length: 15m
- Paper Speed : 12.5 / 25 / 50 (mm/sec)
- Traces : Maximum 3 tracks
- Recording way : Real-time recording, Periodic recording, Alarm recording

Alarm

- Level : Low, medium and high
- Indication : Auditory and visual
- Patient Physiological Alarm Light color: Yellow & Red:
- Equipment Technical Alarm Light color: Blue
- Supports Pitch Tone and multi-level volume;
- Supports custom arrhythmia tone

Input device

- Touch screen:standard config
- Mouse input:Support
- Keyboard input:Support

System Output & Extensible Interfaces

- Ethernet Network: 1 Standard RJ45 socket
- Defibrillation Output:1 BNC connector
- Nurse Call: 1 RJ11 connector
- Video Output : 1 VGA port
- SD meomery card : 2G (Option)
- Analog Output (ECG or IBP) : Option

Trend & Reviewing :

- Trend : Lond trend:168h,minimum resolution is 1min (store when power goes off)
  High resolution trend:2h, minimum resolution is 5s
- NIBP measurement reviewing : 1000 groups
- ARR event: 128 groups of ARR event and the associated waveform.
- Alarm events:128 groups of parameter alarm events and associated parameter waveform at the alarm moment
- Full Disclosure waveform：24 hours for 3 waveforms(with 2G SD cord)

Environment

- Operating temperature:0℃ ~ +40℃
- Storage temperature:-20℃ ~ +50℃
- Operating humidity:15% to 85% non condensing
- Storage humidity:10% to 93% non condensing
- Operating atmospheric pressure: 860hPa to 1060hPa
- Storage atmospheric pressure:500hPa to 1060hPa

Safety:

- IEC60601-1 Approved, CE marking according to MDD93/42/EEC

Performance:

ECG

- Lead Mode : 3-leads ECG input
  5-leads ECG input
  12-leads ECG input
- Lead selection :I, II, III
  I, II, III, aVR, aVL, aVF, V-
  I, II, III, aVR, aVL, aVF, V1~V6 (option)
- Gain : 2.5 mm/mV(x0.25), 5 mm/mV(x0.5), 10 mm/mV(x1), 20 mm/mV(X2),40mm/mv(x4),Auto
- CMRR : Monitor mode≥105dB
  Surgery mode ≥105dB
  Diagnostic mode≥90dB
- Frequency response (-3d B):
  Monitor mode 0.5~40Hz
  Surgery mode 1~25Hz
  Diagnostic mode 0.05~150Hz
- Input impedance : ≥5.0 Mohm
- ECG signal range: ± 10.0mV
- Electrode offset potential: ± 500mV
- Patient Leakage Current : <10 uA
- Standardizing signal :1 mV ± 5%
- Baseline recovery : <5s after Defibrillation. (Mon or Surg mode)
- Indication of electrode separation : Every electrode (exclusive of RL)
- Protection: Breakdown Voltage 4000VAC 50/60Hz; defibrillator proof
- Sweep speed : 12.5mm/s, 25mm/s, 50mm/s

HR

- Range : Adult 10~300 bpm
  Pediatric & Neonate: 10 ~350bpm
  Refreshing time : ≤50 bpm Per 2 pulses
  50~120bpm Per 4 pulses
  ≥120bpm Per 6 pulses
- Resolution : 1 bpm
- Accuracy : ± 1% or ± 1bpm, whichever is greater

ST segment

- Measurement range : -2.0mV~2.0mV
- Accuracy: -0.8mV~0.8mV ; ± 0.02mV or ± 10%, whichever is greater
  Over±0.8mV: unspecified
- Resolution : 0.01mV

RESP

- Method : Thoracic impedance
- Lead Selected from: I (RA-LA) or II (RA-LL); Default: I
- Gain : x0.25, x1 x2 x4
- Bandwidth: 0.25 Hz to 2.0Hz (-3dB)
- Sweep speed : 6.25mm/s, 12.5mm/s, 25mm/s
- Measurement Range : 0~150 rpm
- Resolution : 1 rpm
- Accuracy : ± 2rpm or ± 2%, whichever is greater
- Delay of Apnea Alarm : 10s,15s,25s,30s,35s,40s,45s,50s,55s, 60s

NIBP

- Way of measurement : Automatic oscillometry
- Range of measurement :
  Adult : SYS 30~270 mmHg
  DIA 10~220 mmHg
  MAP 20~235 mmHg
  Child: SYS 30~235 mmHg
  DIA 10~220 mmHg
  MAP 20~225 mmHg
  Neonate: SYS 30~135 mmHg
  DIA 10~100 mmHg
  MAP 20~125 mmHg
- Cuff pressure range : 0~300 mmHg
- Resolution : 1 mmHg
- Pressure Accuracy : Static : ± 2% or ± 3mmHg , whichever is greater
  Clinical : ±5 mmHg average errorr
  standard deviation : ≤8 mmHg
- Unit: mmHg, kPa
- Measurement mode:Manual , Auto, STAT
- Intervals for AUTO measurement time : 1,2,3,4,5,10,15,30,60,90 minutes; 2,4,8,12hours
- STAT mode cycle time : Keep 5 minutes, at 5 seconds interval.
- Overpressure Protection : Hardware and software double protections
- Pulse rate range : 40 ~ 240 bpm

BLT-SpO2 (Digital Technic)

- Measurement Range : 0~100%
- Resolution: 1%
- Accuracy: At 70~100%, ±2%
  At 0~69%, unspecified

PR

- Measurement Range : 25~255 bpm
- Resolution : 1 bpm
- Accuracy : ± 1% or ± 1 bpm, whichever is greater

Nellcor-SpO2 (option)

- Measurement Range : 0~100%
- Resolution : 1%
- Accuracy : At 70~100%, ±2% (Adult)
  At 70~100%, ±3% (Neonate)
  At 70~100%, ±2% (Low Perfusion)
  At 0~69%, unspecified

PR

- Measurement Range : 20~300 bpm
- Resolution : 1 bpm
- Accuracy : 20bpm to 250bpm: ± 3 bpm
  251bpm to 300bpm: unspecified

Masimo SpO2 (option)

- Measurement range:0% to 100%
- Resolution: 1%
- Accuracy: 70% to 100% ± 2% Adult/pediatric, non-motion conditions
  70% to 100% ±3% Neonate, non-motion conditions
  70% to 100% ±3% Motion conditions
  0% to 69% unspecified
- Average time: 2-4s, 4-6s, 8s, 10s, 12s, 14s, 16s

PR

- Measurement range:25 bpm to 240 bpm
- Accuracy : ± 3bpm Non-motion conditions
  ± 5bpm motion conditions
- Resolution:1 bpm

TEMP

- Max Channel : 8
- Measurement way: Thermal resistance way
- Measurement Range : 0.0℃ ~ 50.0 ℃ (32˚F~122˚F)
- Accuracy : ±0.1℃ or ±1 ˚ F (exclusive of probe)
- Resolution : 0.1℃ or 1 ˚F
- Unit : Celsius (℃), Fahrenheit (˚F)

IBP

- Max Channel : 8
- Measurement way: Directly invasive pressure measurement
- Sensitivity of transducer: 5uV/V/ mmHg, ± 2%
- Impedance of transducer: 300 to 3000Ω
- Measurement Range : -50 ~ +350 mmHg
- Resolution : 1mmHg
- Unit : mmHg, kPa,cmH2O
- Accuracy :
  Static: ±1mmHg or 2%, whichever is greater (exclusive of transducer)
  ±4mmHg or 4%, whichever is greater (inclusive of transducer)
  Dynamic : ±4mmHg or 4%, whichever is greater
  Transducer sites : Arterial Pressure (ART)
  Pulmonary Artery Pressure (PA)
  Left Atrium Pressure (LAP)
  Right Atrium Pressure (RAP)
  Central Venous Pressure (CVP)
  Intracranial Pressure (ICP)
  P1/P2
- Selection of measurement range :
  ART : 0 ~ +350mmHg
  PA : -10 ~ +120 mmHg
  CVP/RAP/LAP/ICP: -10 ~ +40 mmHg
  P1/P2 : -50 ~ +350 mmHg

$EtCO_2$ (Sidestream)

- Measure method : Infrared spectrum
- Measurement Range : 0.0~13.1% (0~99.6 mmHg)
- Resolution : 1 mmHg
- Unit : %, mmHg, kPa
- Accuracy : 0% to 4.9% ± 0.3% (± 2mmHg)
  5.0% to 13.1%, < ± 10% of reading
- Measurement range of awRR : 3~150 rpm
- Calibration: Offset calibration: auto, manual, Gain calibration

$EtCO_2$ (Mainstream)

- Measure method : Infrared spectrum
- Warm up time : Capnogram displayed in less than 15 seconds, At an ambient temperature of 25 ℃ ,full specifications within 2 minutes.
- Measurement Range : 0.0~19.7% (0~150 mmHg)
- Resolution : 1 mmHg
- Rise time (10 l/min) : ≤ 60 ms
- Unit : %, mmHg, kPa
- CO_2 Accuracy 0 - 40 mmHg, ± 2mmHg
  41 - 70 mmHg,± 5% or reading
  71 - 100 mmHg,± 8% or reading
  101 - 150 mmHg, ± 10% of reading
  (at 760 mmHg, ambient temperature of 35 ℃)
- awRR measurement range: 0~150 rpm
- awRR measurement Accuracy: ± 1 rpm

$EtCO_2$ (Microstream)

- Measure method : Infrared spectrum
- Warm up time : Capnogram displayed in less than 20 seconds, At an ambient temperature of 25 ℃ , full specifications within 2 minutes.
- Measurement Range : 0 - 19.7%(0-150mmHg)
- Resolution : 1mmHg
- Unit : %, mmHg, kPa
- CO_2 Accuracy 0 - 40 mmHg, ± 2mmHg
  41 - 70 mmHg,± 5% of reading
  71 - 100 mmHg,± 8% of reading
  101 - 150 mmHg,± 10% of reading
  (at 760 mmHg, ambient temperature of 25 ℃)
  (when Rr >80 rpm, all the range is ± 12% or reading)
  CO_2 response time: < 3s
- awRR measurement range 2~150 bpm
- awRR measuremen Accuracy : ± 1rpm
- Sample Flow Rate 50 ml/min ± 10ml/min

Anesthetic Gas

- Measure method : Infrared spectrum
- Measure mode : Mainstream or Sidestream
- Fi and Et values : CO_2 N_2O O_2 AG (HAL, ISO, ENF, SEV, DES)
- Resolution : 1%
- Unit : %.
- Calibration : Room air calibration performed automatically when changing airway adapter (<5 sec)
- Warm-up time : <10 s, full accuracy within 1 min
- Measurement and alarm range of AG:

Gas	Range	Accuracy
CO2	0-10 %	±(0.3%ABS+4% REL)
N2O	0-100 %	±(2% ABS+8% REL)
O2	10-100 %	±(2% ABS+2% REL)
HAL, ISO, ENF	0-5%	±(0.15% ABS+10% REL)
SEV	0-8%	±(0.15% ABS+10% REL)
DES	0-18%	±(0.15% ABS+10% REL)

- awRR measurement range : 0~150 rpm
- awRR measurement Accuracy : ± 1 rpm
- Rise time (flowing speed 10 l/min) CO2 ≤ 90 ms
  O2 ≤ 300 ms
  N2O ≤ 300 ms
  Hal, Iso, Enf, Sev, Des ≤ 300 ms
- Total system response time : < 1 seconds

C.O.

- Measurement Mode: Thermal dilution method
- Measurement Wave: Thermal dilution curve
- Measurement parameters: C.O., TB, TI, C.I.
- Measurement Range:C.O.: 0.1 L/min ~ 20 L/min
  TB: 23.0 ~ 43.0℃
  TI: -1.0 ~ 27.0℃
- Resolution :C.O.: 0.1 L/min
  TB: 0.1℃
  TI: 0.1℃
- Accuracy:C.O.: 2% SD TB.TI:±0.1℃
- TB Alarm range:23.0~43.0℃ , high/low limit can be adjusted continuously

Standard configation :

Mainunit: 15" TFT-LCD display, 3 Standard module slot, Touch Screen, 1 RJ45 enthernet socket, 1 Defibrillation Output, 1 Nurse Call socket, 1 VGA port, 2 USB1.1 port, 1 Lithium rechargeable battery.

Option :

Option Module: Sidestream CO_2 Module,Microstream CO_2 module,Mainstream CO_2 module,AG module,C.O.module,IBP module,Temp module,Masimo SpO2 module, Nellcor SpO2 module.
Navigating: USB compatible mouse and keyboard.
Printing: 3 channel thermal recorder
Mounting Rolling stand , wall mount
Battery: 11.1V/4.0AH Rechargeable Lithium Battery.
Other options: External Display, Wireless Lan,Extensive Memory card, Analog Output (ECG or IBP)

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