



ESQ5 / ESQ3

Modular Patient Monitors



INTENSIVE CARES



ESQ5 / ESQ3

TECHNICAL SPECIFICATION:

ESQ5 / ESQ3

ESQ5 / ESQ3 Main Unit

Size and Weight

- Size : 318mmX264mmX152mm
- Weight : ≤ 4.5kg
- Standard module slot: 2

Power supply

- Power Voltage: AC 100-240V 50/60Hz
- Input Current: 1.1~0.5A
- Safety class: Category I

Display

- ESQ5 : 12.1" ESQ3 : 10.4" Color TFT-LCD
- Resolution : 800X600 pixels

Battery

- Type: Rechargeable Lithium battery, 11.1V/4.0AH
- Operating time under the normal use and full charge : ≥210minutes

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
- Knob: 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
- USB1.1 port : 2
- SD memory 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 °C ~ +40 °C
- Storage temperature: -20 °C ~ +50 °C
- 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 (-3dB):
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 : ×0.25, 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 30~220 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 error
standard deviation : ≤8 mmHg
- Unit : mmHg, kPa
- Measurement mode: Manual, Auto, STAT
2, 4, 8, 12 hours
- Intervals for AUTO measurement time : 1, 2, 3, 4, 5, 10, 15, 30, 60, 90 minutes;
- 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 °C ~ 50.0 °C (32 °F ~ 122 °F)
- Accuracy : ± 0.1 °C or ± 1 ° F (exclusive of probe)
- Resolution : 0.1 °C or 1 ° F
- Unit : Celsius (°C), Fahrenheit (°F)

IBP

- Max Channel : 8
- Measurement way : Directly invasive pressure measurement
- Sensitivity of transducer : 5uV/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

EtCO2 (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

EtCO2 (Mainstream)

- Measure method : Infrared spectrum
- Warm up time : Capnogram displayed in less than 15 seconds, At an ambient temperature of 25 °C, 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
- CO2 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 35 °C)
- awRR measurement range : 0~150 rpm
- awRR measurement Accuracy : ± 1 rpm

EtCO2 (Microstream)

- Measure method : Infrared spectrum
- Warm up time : Capnogram displayed in less than 20 seconds, At an ambient temperature of 25 °C, full specifications within 2 minutes.
- Measurement Range : 0~19.7% (0~150mmHg)
- Resolution : 1mmHg
- Unit : % mmHg, kPa
- CO2 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 °C)
- (when Rr > 60 rpm, all the range is ± 12% or reading)
- CO2 response time : < 3s
- awRR measurement range : 2~150 bpm
- awRR measurement 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 : CO2, N2O, O2, 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 °C
TI: -1.0 ~ 27.0 °C
- Resolution : C.O.: 0.1 L/min
TB: 0.1 °C
TI: 0.1 °C
- Accuracy: C.O.: 2% SD TB, TI: ± 0.1 °C
- TB Alarm range: 23.0~43.0 °C, high/low limit can be adjusted continuously

Standard configuration:

- Main unit: ESQ5: 12.1" ESQ3: 10.4" TFT-LCD display, 2 Standard module slot, Touch Screen, 1 RJ45 ethernet socket, 1 Defibrillation Output, 1 Nurse Call socket, 1 VGA port, 2 USB1.1 port, 1 Lithium rechargeable battery.

Option:

- Option Module: Sidestream CO2 module, Microstream CO2 module, Mainstream CO2 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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