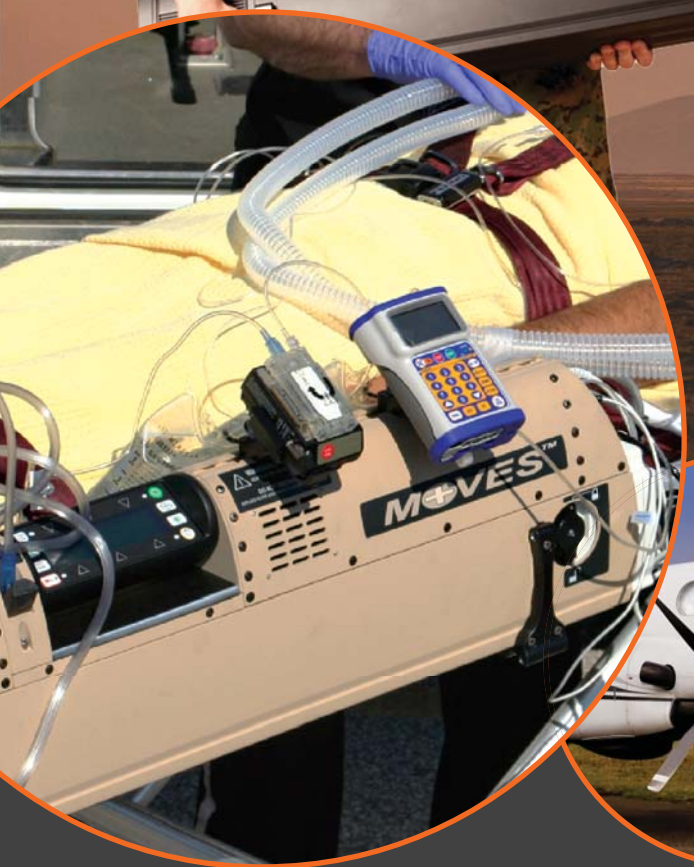
MOVES®

TRANSPORT LIFE SUPPORT SYSTEM

Take The Point Of Care Anywhere

The MOVES system is the world's first completely integrated Portable Life Support System with a built-in oxygen concentrator, eliminating the need for pressurised oxygen tanks.

MOVES stays with the patient and the stretcher providing life-saving continuity from the point of incident to the final point of care. It also eliminates the need to transfer the patient between stretchers, monitors or ventilation and makes dedicated medivac and retrieval craft unnecessary.



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TRANSPORT LIFE SUPPORT SYSTEM

The MOVES system is the world's first completely integrated Portable Life Support System with a built-in oxygen concentrator which eliminates the need for pressurised oxygen tanks.

MOVES with the Patient:
Why change stretchers, monitoring or ventilation when moving from incident site to ambulance to fixed wing to helicopter?

Dedicated Craft not Required:
MOVES stays with the patient and the stretcher providing life-saving continuity from the point of incident to the final point of care and making dedicated medivac and retrieval craft unnecessary.

Safe and Compact:
Eliminate the requirement to carry and store dangerous oxygen cylinders and pressure regulating equipment

Deploy almost ANYWHERE:
Collapsed buildings, caves, mountains, ravines… Drop into places inaccessible to a vehicle and airlift vertically while in operation.

Specifications

Physical Properties
Unit Weight: 18.71 kg (41.25 lbs) Excludes batteries, accessories, options cables etc.
Battery Weight: 1.89 kg (4.17 lbs)
Length: 1010 mm (39.75")
Excluding hydrocarbon filter 1052 mm (41.4") width.
Width: 140 mm (5.5")
Excluding clamp brackets 165 mm (6.5") width.
Height: 230 mm (9.0")
Excluding clamp brackets 244 mm(9.6") width.
Exterior Housing Material: Aluminium
Operating Sound Level: <70dB at a distance of 1 m level.
Standards Compliance:

IEC 60601-1	IEC 60601-1-1
IEC 60601-1-2	IEC 60601-1-8
IEC 60601-2-27	IEC 60601-2-34
IEC 60601-2-49	ISO 9919
ISO 21647	ISO 23328-1
ISO 23328-2	ANSI/AAMI SP10
ANSI/AAMI EC13	ASTM E1112-00
BS EN 794-3	MIL-STD-810F
JECETS	

Device Classification: Class II, CF Defibrillation Proof
Screen: 159 mm x 50 mm Resolution of 256 x 44 pixels.

Ventilator Specifications
Tidal Volume: 100–750 mL
Respiratory Rate: 6–40 B/M
Inspiratory/Expiratory Ratio: 1:1 to 1:3
Inspiratory Time: 0.3–3 seconds
Peak Flow: 60 LPM
Positive End Expiratory Pressure: (PEEP) 0–20 cmH2O
Positive pressure relief valve: 70 cmH2O
Pressure Control (PC): 10–55 cmH2O (over PEEP). PC (Pressure Control) = PIP (Peak Inspiratory Pressure) – PEEP (Positive End Expiratory Pressure)
Pressure Support Ventilation: OFF, 5–40 cmH2O
Trigger Sensitivity: (Normal):
10 LPM (flow) or 3 cmH2O (pressure) below PEEP
Trigger Sensitivity (Low):
15 LPM (flow) or 6 cmH2O (pressure) below PEEP
External Oxygen Supply: 15 LPM maximum (@ 2 psi minimum)
Modes: PC-IMV (default), VC-IMV, PC-A/C, VC-A/C, PC-SIMV, PC-SIMV+PS, VC-SIMV, VC-SIMV+PS, PS
Standards Compliance: EN 794–3
Ventilator Circuit compliance including cartridge: Approximately 0.7 mL/cmH2O over the ventilator settable pressure range.
Compressible volume of ventilator and cartridge: 1350 mL
(Note: System compensates for compressible volume).

Suction Specifications
Suction Vacuum: –100 to –325 mmHg
Flow Rate: 20 LPM
Suction Canister: 800 mL capacity
Suction Tubes: Withstands up to 49°C

Electrical Characteristics
External Power: 100–240 VAC, 50–60 Hz, 5.5 A max.
Max Current Output: 28 VDC, 14.3 A max.
Battery Type: 25.9V lithium polymer
Battery Charge Time (per set 2 batteries):
2.5 hrs when the system is idle.
Battery Life (per set 2 batteries):
Typical operation: Up to 7 hours with ventilator and monitors on, running concentrator with ¼ duty cycle.
Notes: Battery run time is highly dependent on use of the oxygen concentrator or suction.

Environmental Specifications
Temperature Operating: –26ºC to 50ºC (–15ºF to 122ºF)
Storage: –26ºC to 50ºC (–15ºF to 122ºF)
Relative Humidity: 15% to 95% non-condensing
Altitude: 0–10,000 ft. (3048m)
Water Resistance:
MIL-STD-810F Method 506.4 for blowing rain
Blowing Sand and Dust Resistance:
MIL-STD-810F Method 510.4 Procedure II.

Patient Monitoring Specifications
Heart Rate Monitoring Specifications
Source: Auto-detect in the priority sequence of ABP, SpO2, ECG
Range: 30-245 bpm
Accuracy: ±1% Full Scale (under stationary operation)
±5 BPM (under continuous vibration)
Pacemaker Pulse Rejection Capability:
Pacemaker pulses may be detected by the heart rate monitor and included in its calculation, depending on the type and model of pacemaker detected by the heart rate monitor.
Fixed Delays Due to Signal Processing: ABP: Pulse heart rate is calculated from the previous 6 beats.
SpO2: Pulse heart rate is calculated from the previous 4 beats.
ECG: Pulse heart rate is calculated from the previous 8 beats.
Alarm Condition Delay (onset of condition to internal realization):
ABP: 6 beats + 100 ms
SpO2: 4 beats + 100 ms
ECG: 8 beats + 100 ms
Alarm Signal Generation Delay (realization to display):
Less than 200 ms
Operating Mode That May Affect Alarm Generation: None.

Temperature Monitoring Specifications
Range: 28°C to 42°C (82.4°F to 107.6°F)
Accuracy: ±0.1°C.
Airflow Monitoring Specifications
Inspiratory/Expiratory Flow Range: –60 to 60 LPM
Repeatability of Inspiratory/Expiratory Flow Measure:
±0.5% (% of reading)
Airway Pressure (Paw) Range: –5 to 70 cmH2O
Accuracy of Airway Pressure Measure:
±2 cmH2O + 8% of reading

CO2 Monitoring Specifications
Range: 0 to 10% by Volume
Accuracy: CO2 sensor accuracy is +/-0.5% absolute, for values under 5% CO2 monitoring system accuracy is 1% absolute
Rise Time: 215 ms (10-90%) at 200 ml/min
Response time of gas sample readings: < 4 seconds
Flow Rate: 450 ml/min + 50 ml/min
Standards Compliance for CO2 Analyser Used:
ISO 21647: Medical electrical equipment – Particular requirements for the basic safety and essential performance of respiratory gas monitors.

O2 Monitoring Specifications
Range: 10 to 99% by Volume
Resolution: 0.02%
Sensor Accuracy: 0.2% Absolute
System Accuracy: O2 sensor accuracy is +/- 0.2% absolute O2 Monitoring system accuracy is 4%
Rise Time: 150 ms (10-90%) at 150 ml/min
Response time of gas sample readings: < 4 seconds
Flow Rate: 450 ml/min + 50 ml/min
Standards Compliance for O2 Analyser Used ISO 21647: Medical electrical equipment – Particular requirements for the basic safety and essential performance of respiratory gas monitors.

ECG Specifications
Number of Leads: 3
Lead View: Einthoven I when connected as shown in operating manual.
Input Impedance: >2.5 MOhm
Input Range: >10 mvpp
Input Range: (DC) >300 mV
Sensitivity (mV/Cm): 4.9, 1.2
Filtering: 60 Hz notch filter
Frequency Response: 0.3–40 Hz
Pulse Detection: 30 – 245 bpm + - 1%, + - 1 Digit, 8 beat averaging.
Defibrillator Protection: Yes
ST Analysis: None
Pacer Detection: None
Standard Complied To: ANSI / AAMI T-13
Maximum T-Wave Amplitude: 0.6 mV
T-Wave Rejection: The tall T-wave rejection is always on. The max T-wave rejection is 0.6 mV when R-wave is 1 mV.
Response Time to Heart Rate Meter:
Longest Time: < 10 seconds 80 BPM–120 BPM
Longest Time: < 15 seconds 80 BPM–40 BPM
Pacemaker Pulse Representation:
Pacemaker pulses will be displayed in the MOVES® ECG waveform display and can affect heart rate, particularly in Hi-F mode (as an overestimation).

NIBP Specifications
Measurement Cycles: Stat, 1, 2, 3, 4, 5, 10, 15 minutes
Max Allowable Cuff Pressure: 300 mmHg
Adult Range: Systolic: 40–260 / Diastolic: 20–200
Resolution: 1 mmHg
Accuracy: ±5 mmHg Average with STD of 8 mmHg
Calibration: The cuff pressure transducer should be verified once every 12 months.

Invasive Pressure Specifications
Channels: 2
Transducer Sites: ABP and either CVP or ICP
Pressure Range: ABP: –10 to 300 mmHg
CVP: –10 to 300 mmHg
ICP: –13 to 408 cmH2O
Temperature:
Operating: 0° to 40°C (32°F to 104°F)
Storage: -18° to 50°C (0.4°F to 104°F)
Accuracy: ±4 mmHg or 4% of reading whichever is greater
Operating Mode That May Affect Alarm Generation: None
Method: Dual wavelength LED: Red LED at 660 nm and Infrared LED at 810 nm

Batteries
Operating Temperature: –26ºC to 50ºC (–15°F to 122°F)
Storage Temperature: –20ºC to 60ºC (–4°F to 140°F)
Charging Temperature: 0ºC to 40ºC (32° to 104°F)

Hydrocarbon / Particulate Filter
Effective Filtration Against:
GME Organic Vapor, Chlorine, Sulfur Dioxide, Chlorine Dioxide, Hydrogen Chloride, Hydrogen Sulfide, Ammonia, Methylamine, Formaldehyde, Hydrogen Fluoride: 99.97% effective against all particulate aerosols.

Ear Clip Pulse Oximeter Sensor
Displayed Oxygen Saturation Range (SpO2): 0 – 100%
Displayed Pulse Rate Range: 18 to 250 beats per minute (BPM)
SpO2 Accuracy: 70–100% ± 3 digits (Arms)
Pulse Rate Accuracy: 18–300 BPM ± 3 digits (Arms)
Operating Temperature: 0°C to 40°C (32° to 104°F)
Storage Temperature: –30°C to 50°C (–22°F to 122°F)
Measurement Wavelengths and Output Power:
Red: 660 nanometers @ 0.8mw
Infrared: 910 nanometers @ 1.2mw

Finger Clip Pulse Oximeter Sensor
Displayed Oxygen Saturation Range (SpO2): 0 – 100%
Displayed Pulse Rate Range: 18 to 250 beats per minute (BPM)
Measurement Wavelengths and Output Power:
Red: 660 nanometers @ 16 mw peak
Infrared: 910 nanometers @ 10mw peak.
SpO2 Accuracy:
No Motion: 70 – 100% + 2 digits (Arms *)
Motion: 70 – 100% + 3 digits (Arms*)
* Arms encompasses 68% of the population.
Operating Temperature: –20°C to + 50°C (-4°F to + 122°F)
Storage/Transportation Temperature: –30°C to + 50 °C (-22°F to + 122°F)
Operating Humidity: 10% to 90% noncondensing
Storage Humidity: 10% to 95% noncondensing

NIBP Cuffs (ALL)
Operating Temperature: 0°C to 40°C (32°F to 104°F)
Storage Temperature: –34°C to 70°C (–29.2°F to 158°F)

Temperature Probe (Reusable / Autoclavable)
Temperature: Interchangeable ±0.1°C, 25°C to 45°C per EN 12470
Tested to ±0.1°C, 0°C to 70°C for laboratory use
Autoclave:
Withstands 100 autoclave cycles to 121°C
Withstands 50 autoclave cycles to 134°C

THORNHILL RESEARCH

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