FLUKE®

Biomedical

PS420
Patient Simulator

Technical Data

The PS420 is a handheld, high-performance simulator for testing patient monitors.

Small enough to fit in a pocket, the handy PS420 features a wide variety of simulation capability, including a full range of ECG, respiration, blood pressure, temperature and cardiac output conditions. The tool includes 12-lead ECG, two-channel blood pressure simulation, 35 arrhythmia selections, pacemaker simulation as well as adult and pediatric normal sinus rhythms.

For convenient use, labeled hot keys on the keypad guide users to the most common settings.

Key Features

- Compact, lightweight, pocketsize
- Labeled hot keys for common settings
- 12-lead ECG
- Respiration and temperature selection
- Two-channel blood pressure simulation
- Optional cardiac output
- Adult and pediatric normal sinus rhythms
- 35 arrhythmia selections
- ECG performance waveforms
- ST segment levels
- ECG artifact
- Pacemaker simulation
- RS232 serial port for computer control
- Battery operated

Technical Specifications

ECG
Normal Rate: 80 BPM
Selectable Rates: 30, 40, 60, 80, 100, 120, 140, 160, 180, 200, 220, 240, 260, 280, and 300 BPM
Accuracy: ± 1 %
Output Impedance: 500, 1000, 1500, and 2000 Ω for Leads I, II, and III
ECG Amplitudes: 0.5, 1, 1.5, and 2 mV
Amplitude Accuracy: ± 2 % Lead II
High-Level Output: 1000x Lead II

Adult or Pediatric ECG Waveform
Performance Waveform
Lead II Square Wave: 2 Hz, 0.125 Hz
Pulse: 30, 60, and 120 BPM, 60 ms pulse width
Sine Wave: 0.5, 4, 10, 40, 50, and 60 Hz (1 mV amplitude, Lead II)
Triangle Wave: 2 Hz

ST Segment Analysis
Elevated or Depressed: – 0.8 mV to + 0.8 mV in 0.1 mV steps

Pacemaker
Pacer Spike Amplitude: 2, 4, 8, and 10 mV in Lead II
Accuracy: ± 5 %, Lead II
Pacer Spike Duration: 0.1, 0.5, 1, 1.5, and 2 ms
Accuracy: ± 5 %
Asynchronous Pacemaker
Pacer Non-Function
Pacer Non-Capture
Demand Occasional Sinus
Demand Frequent Sinus
AV Sequential

Blood Pressure
Input/Output Impedance: 350 Ω
Exciter Input Limit: ± 10 V
Exciter Input Frequency Range: DC to 4000 Hz
Transducer Sensitivity: 5 or 40 µV/V/mmHg
Level Accuracy: ± 1 %, ± 1 mmHg
Static Levels BP1: – 10, 0, 50, 100, 150, 200, and 250 mmHg
Static Levels BP2: – 10, 0, 80, 160, 240, 320, and 400 mmHg
Channel Selections:
Arterial 120/80, Channel 1 and 2
Radial Artery 120/80, Channel 1 and 2
Left Ventricle 120/00, Channel 1 and 2
Right Ventricle 25/00, Channel 1 and 2
Central Venous 15/10, Channel 2
Pulmonary Artery 25/10, Channel 2
Pulmonary Wedge 10/2, Channel 2
Left Atrium 14/4; Automatic Swan/Ganz (every 20 sec)
Manual Swan/Ganz (changes when entry is selected), Channel 2
Synchronized with all normal sinus rates.
Physiologically track all arrhythmia selection

Cardiac Output
(must have optional Cardiac Output Adapter Box p/n 2462200)
Catheter Type: Baxter Edwards, 10 cc
Blood Temperature: 98.6 ˚F (37 ˚C)
CO for 35.6 ˚F (2 ˚C): 3, 5, 7 l/min
CO for 68 ˚F (20 ˚C): 3, 5, 7 l/min
Cal Pulse: Of 1 ˚C for 1 sec; of Delta 402 Ω for 4 sec.
Computational Constant: For 35.6 ˚F (2 ˚C) is 0.561; for 68 ˚F (20 ˚C) is 0.608
Left to Right Shunt: 35.6 and 68 ˚F (2 and 20 ˚C)
Faulty Injectate: 35.6 and 68 ˚F (2 and 20 ˚C)
Accuracy: ± 5 %
Calibrated or uncalibrated cardiac output waves for 4 different CO values

Respiration
Baseline Impedance: 500, 1000, 1500, and 2000 Ω, Leads I, II, and III
Lead Selections: LL or LA
Impedance Variations: 3, 1, 0.5, and 0.2 Ω
Accuracy: ± 5 %
Rates: 15, 20, 30, 40, 60, 80, 100, 120, and 0 BPM for Apnea
Accuracy: ± 2 %
Apnea: 12 seconds, 22 seconds, 32 seconds, and continuous

Temperature
Compatibility: YSI 400/700 Series
Temperature: 86, 95, 98.6, 104, and 107.6 ˚F (30, 35, 37, 40 and 42 ˚C)
Temperature Simulation Accuracy: ± 0.25 ˚C

Arrhythmias
Base Rate of 80 BPM
Sinus Arrhythmia
Atrial (PAC)*
Missed Beat*
Atrial Tachycardia
Atrial Flutter
Nodal (PNC)*
Nodal Rhythm
Supraventricular Tachycardia
PVC1 Left Ventricular Focus*
PVC 1 Early, LV Focus *
PVC1 R on T, LV Focus*
PVC2 Right Ventricular Focus*
PVC2 Early, RV Focus*
PVC2 R on T, RV Focus*
Multifocal PVCs*
Atrial Fibrillation Coarse/Fine
PVCs 6/minute
PVCs 12/minute
PVCs 24/minute
Frequent Multifocal PVCs
Bigeminy
Trigeminy
Pair PVCs*
Run 5 PVCs *
Run 11 PVCs*
Ventricular Tachycardia
Ventricular Fibrillation Coarse/Fine
Asystole
Conduction Defects
First Degree
Second Degree
Third Degree
Right Bundle Branch Block
Left Bundle Branch Block

*Will go to NSR ECG @ 80 BPM after completion

Artifacts
50/60 Hz
Muscle
Baseline
Respiration

Controls
Display: 2-line by 16-character LCD with keypad
RS232: Bidirectional interface, 9600 Baud

General Information
Power: 9 V battery/battery eliminator
Housing: ABS plastic case
Dimensions: 6.1 in L x 3.7 in W x 1.3 in H (15.6 cm L x 9.4 cm W x 3.4 cm H)
Weight: 0.9 lb (0.4 kg)
Temperature Requirements
Operating: 59 ˚F to 95 ˚F (15˚C to 35 ˚C)
Storage: 32 ˚F to 122 ˚F (0 ˚C to 50 ˚C)

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Ordering Information

Model
2631290: PS420 Patient Simulator

Standard Accessories
2631808: PS420 printed-version user manual
2631721: PS420 electronic-version user manual (CD)
2647372: Battery eliminator 100 VAC to 240 VAC
N/A: 9 V battery

Optional Accessories
2462072: Universal banana adapter (17024)
2462189: Carrying case, single pocket
2462177: Carrying case, double pocket
2651740: Cardiac output adapter box PS420 (17290)
2462295: BP cable, unterminated PS420
2462312: Temp.cable, unterminated PS420
2670242: PS420 service & calibration manual
2462217: RS232 cable

About Fluke Biomedical
Fluke Biomedical is the world's leading manufacturer of quality biomedical test and simulation products. In addition, Fluke Biomedical provides the latest medical imaging and oncology quality-assurance solutions for regulatory compliance.

Today, biomedical personnel must meet the increasing regulatory pressures, higher quality standards, and rapid technological growth, while performing their work faster and more efficiently than ever. Fluke Biomedical provides a diverse range of software and hardware tools to meet today's challenges.

Fluke Biomedical Regulatory Commitment
As a medical device manufacturer, we recognize and follow certain quality standards and certifications when developing our products. We are ISO 9001 certified and our products are:
- FDA Compliant
- CE Certified, where required
- NIST Traceable and Calibrated
- UL, CSA, ETL Certified, where required

Fluke Biomedical.
Better products. More choices. One company.

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