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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 simulation
- Respiration and temperature simulation
- Two-channel invasive blood pressure simulation
- Cardiac output simulation
- Adult and pediatric normal sinus rhythms
- 35 arrhythmia selections
- ECG performance waveforms
- ST segment levels
- ECG artifact
- Pacemaker simulation
- RS-232 serial port for computer control
- Battery operated
- PS420/DPM1B Bundle kit with custom carrying case for quick ECG/NIBP patient monitor testing

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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 Ω, 1000 Ω, 1500 Ω, and 2000 Ω for Leads I, II, and III
ECG amplitudes	0.5 mV, 1 mV, 1.5 mV, and 2 mV
Amplitude accuracy	± 2 % Lead II
Adult or pediatric ECG waveform	
Performance waveform	
Lead II square wave	2 Hz, 0.125 Hz
Pulse	30 and 60 BPM, 60 ms pulse width
Sine wave	0.5 Hz, 4 Hz, 10 Hz, 40 Hz, 50 Hz, 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 mV, 4 mV and 6 mV in Lead II
Accuracy	± 5 %, Lead II
Pacer spike duration	0.1 ms, 0.5 ms, 1 ms, 1.5 ms and 2 ms in Lead II
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 µV/V/mm Hg or 40 µV/V/mm Hg
Level accuracy	± 1 %, ± 1 mm Hg
Static levels BP1	– 10, 0, 50, 100, 150, 200, and 250 mm Hg
Static levels BP2	– 10, 0, 80, 160, 240, 320, and 400 mm Hg
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)	
Catheter type	Baxter Edwards, 10 cc
Blood temperature	37 °C (98.6 °F)
CO for 2 °C (35.6 °F)	3, 5, 7 l/min

CO for 20 °C (68 °F)	3, 5, 7 l/min
Cal pulse	Of 1 °C for 1 sec; of Delta 402 Ω for 4 sec
Computational constant	For 2 °C (35.6 °F) is 0.561; for 20 °C (68 °F) is 0.608
Left to right shunt	2 °C and 20 °C (35.6 °F and 68 °F)
Faulty injectate	2 °C and 20 °C (35.6 °F and 68 °F)
Accuracy	± 5 %
Calibrated or uncalibrated cardiac output waves for 4 different CO values	
Respiration	
Baseline impedance	500 Ω, 1000 Ω, 1500 Ω, and 2000 Ω, Leads I, II, and III
Lead selections	LL or LA
Impedance variations	3 Ω, 1 Ω, 0.5 Ω, 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	30 °C, 35 °C, 37 °C, 40 °C and 42 °C (86 °F, 95 °F, 98.6 °F, 104 °F, and 107.6 °F)
Temperature simulation accuracy	± 0.25 °C

Arrhythmias

Base rate of 80 BPM	PVC2 early, RV focus*	Ventricular tachycardia
Sinus arrhythmia	PVC2 R on T, RV focus*	Ventricular fibrillation (coarse
Atrial (PAC)*	Multifocal PVCs*	and fine) on all leads except
Missed beat*	Atrial fibrillation coarse/fine	Lead III
Atrial tachycardia	PVCs 6/minute	Asystole
Atrial flutter	PVCs 12/minute	Conduction defects
Nodal (PNC)*	PVCs 24/minute	First degree
Nodal rhythm	Frequent Multifocal PVCs	Second degree
Supraventricular tachycardia	Bigeminy	Third degree
PVC1 left ventricular focus*	Trigeminy	Right bundle branch block
PVC 1 early, LV focus*	Pair PVCs*	Left bundle branch block
PVC1 R on T, LV focus*	Run 5 PVCs*	
PVC2 right ventricular focus*	Run 11 PVCs*	

*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
RS-232	Bidirectional interface, 9600 Baud
General information	
Power	9 V battery/battery eliminator
Housing	ABS plastic case
Dimensions (WxDxH)	9.4 cm x 15.6 cm x 3.4 cm (3.7 in x 6.1 in x 1.3 in)
Weight	0.4 kg (0.9 lb)
Temperature requirements	Operating: 15 °C to 35 °C (59 °F to 95 °F)
	Storage: 0 °C to 50 °C (32 °F to 122 °F)

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Ordering information

Model numbers/descriptions

PS420 PS420 Patient Simulator

PS420/DPM1B Bundle PS420/DPM1B Bundle Kit (includes PS420, DPM1B, all accessories, and a custom carrying case)

Standard accessories

MANUAL PS420 Users Manual (printed)

CD-ROM PS420 Users Manual (CD)

BE-UNVSL-IEC320C14 Battery Eliminator
100 V ac to 240 V ac

9 V Battery

Optional accessories

17024 Universal Banana Adapter

17191 Carrying Case, single pocket, soft

17192 Carrying Case, double pocket, soft

37290 Cardiac Output Adapter Box PS420

17440 BP Cable, unterminated PS420

17445 Temp. Cable, unterminated PS420

17291 RS-232 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. Highly credentialed and equipped with a NVLAP Lab Code 200566-6 accredited laboratory, Fluke Biomedical also offers the best in quality and customer service for all your equipment calibration needs.

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 test device manufacturer, we recognize and follow certain quality standards and certifications when developing our products. We are ISO 9001 certified and our products are:

- CE Certified, where required
- NIST Traceable and Calibrated
- UL, CSA, ETL Certified, where required
- NRC Compliant, where required

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

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