

# 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, pocket size
- 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

## Specifications

<b>ECG</b>	
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
<b>Adult or pediatric ECG waveform</b>	
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
<b>ST segment analysis</b>	
Elevated or depressed	-0.8 mV to +0.8 mV in 0.1 mV steps
<b>Pacemaker</b>	
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	
<b>Blood pressure</b>	
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
<b>Cardiac output</b> (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		
<b>Respiration</b>		
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	
<b>Temperature</b>		
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	
<b>Arrhythmias</b>		
Base rate of 80 BPM	PVC2 early, RV focus*	Ventricular tachycardia
Sinus arrhythmia	PVC2 R on T, RV focus*	Ventricular fibrillation (coarse and fine) on all leads except
Atrial (PAC)*	Multifocal PVCs*	Lead III
Missed beat*	Atrial fibrillation coarse/fine	Asystole
Atrial tachycardia	PVCs 6/minute	Conduction defects
Atrial flutter	PVCs 12/minute	First degree
Nodal (PNC)*	PVCs 24/minute	Second degree
Nodal rhythm	Frequent Multifocal PVCs	Third degree
Supraventricular tachycardia	Bigeminy	Right bundle branch block
PVC1 left ventricular focus*	Trigeminy	Left bundle branch block
PVC 1 early, LV focus*	Pair PVCs*	
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		
<b>Artifacts</b>		
50/60 Hz		
Muscle		
Baseline		
Respiration		
<b>Controls</b>		
Display	2-line by 16-character LCD with keypad	
RS-232	Bidirectional interface, 9600 Baud	
<b>General information</b>		
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)	

## 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.*

**Fluke Biomedical**  
6045 Cochran Road  
Cleveland, OH 44139-3303 U.S.A.

**Fluke Biomedical Europe**  
Science Park Eindhoven 5110  
5692EC Son, The Netherlands

#### For more information, contact us:

In the U.S.A. (800) 850-4608 or  
Fax (440) 349-2307  
In Europe/M-East/Africa +31 40 267 5435 or  
Fax +31 40 267 5436  
From other countries +1 (440) 248-9300 or  
Fax +1 (440) 349-2307  
Email: [sales@flukebiomedical.com](mailto:sales@flukebiomedical.com)  
Web access: [www.flukebiomedical.com](http://www.flukebiomedical.com)

©2006-2011 Fluke Biomedical. Specifications subject to change without notice. Printed in U.S.A.  
7/2011 2818142C D-EN-N

**Modification of this document is not permitted without written permission from Fluke Corporation.**