

# PS320

## Fetal Simulator

### Technical Data



The PS320 simulates fetal and maternal ECG as well as uterine activity to test and troubleshoot fetal electronic monitors and to train clinical staff.

The unit is battery operated and small enough to fit in a pocket so mobile technicians and clinical instructors can take it anywhere.

The PS320 simulates several fetal parameters, including twins, as well as a wide range of clinical scenarios for training labor-and-delivery staff in how to recognize normal and abnormal responses. An optional mechanical heart creates fetal heart sounds for testing fetal monitor ultrasound cables and transducers.

PS320 offers an easy user interface, providing a 2 x 16-character LCD display with adjustable contrast. The unit operates on a 9 V battery with low-battery monitoring or functions with the supplied battery eliminator.

### Key features

- Mechanical heart for ultrasound simulation
- TOCO simulation (External or IUP)
- Ultrasound simulation (including twins)
- Maternal ECG simulation
- Fetal ECG (tracks ultrasound #1)
- Internal (DECG) and external fetal ECG
- Uterine-activity selections
- Fetal beat-to-beat variability
- Periodic and non-periodic fetal ECG changes
- Arrhythmia selections
- Compact, lightweight, and pocket-size plastic housing
- Battery operated with status indications
- Special kits available with all required accessories and cables to test fetal monitors for specified manufacturers

## Technical specifications

### Fetal ECG

#### Static rates

30 BPM, 60 BPM, 90 BPM, 120 BPM, 150 BPM, 180 BPM, 210 BPM, and 240 BPM

#### ECG sensitivity

50  $\mu$ V, 100  $\mu$ V, 200  $\mu$ V, 0.5 mV, 1 mV, and 2 mV

US-1 tracks primary fetal ECG rates. US-2 tracks secondary fetal activity for either independent "normal" or "twins" simulation, US-2 rate is fixed at 140 BPM

### Fetal patterns

**Note:** US-1 and fetal ECG track these selections. US-2 is in normal pattern, except during TREND #1 selection.

#### Trend #1: Twin fetal patterns

Normal: Normal pattern  
Tachycardia: Tachycardia pattern  
Bradycardia: Bradycardia pattern  
Arrhythmias: Arrhythmia pattern  
Late deceleration: Late deceleration  
Early deceleration: Early deceleration  
Moderate deceleration: Moderate variable deceleration  
Acceleration #1: Acceleration wave #1  
Acceleration #2: Acceleration wave #2  
Sinusoidal (high): Sinusoidal pattern, large change  
Sinusoidal (low): Sinusoidal pattern, small change

Severe variable deceleration #1:  
Severe deceleration wave #2  
Severe variable deceleration #2:  
Severe variable deceleration  
Prolonged deceleration:  
Prolonged deceleration  
Biphasic deceleration: Biphasic deceleration  
Exaggerated deceleration: Exaggerated deceleration  
Non-uniform deceleration:  
Non-uniform deceleration  
Variable deceleration (u): Variable deceleration "U" shaped  
Variable deceleration tach:  
Variable deceleration with high-rate BPM  
Variable deceleration (v): Variable deceleration "V" shaped  
Variable deceleration (post):  
Variable deceleration post exaggerated  
Variable deceleration: Variable deceleration  
Deceleration (position):  
Variable deceleration with position changes  
Long deceleration: Long deceleration  
Compensatory acceleration:  
Compensatory acceler.

### Variability selections (added to fetal ECG)

Absent variability, low variability, mild variability, high variability, severe variability, and long-term variability

**Note:** These patterns repeat and toco channel will perform toco wave selected.

### Optional mechanical fetal heart

Provides a mechanical interface to the ultrasound transducer; can be connected to either ultrasound channels. This option, due to its power consumption, requires an ac power adapter to be connected

### Maternal ECG

#### ECG static rates

60 BPM, 80 BPM, 100 BPM, 120 BPM, 140 BPM, and 160 BPM

#### ECG sensitivity

0.5 mV, 1 mV, and 2 mV

Pattern selected during Trend #1 selection

### Uterine activity

**Note:** Toco waveform selection not available during Trend #1.

Execute waveform: Start toco waveform

Uterine wave off: Stop toco waveform

Analog 0 V to 1 V: Analog range 0 V to 1 V (1 V = 100 mm Hg)

Uterine wave 0 to 25: Range of toco waveform

Uterine wave 0 to 50: Range of toco waveform

Uterine wave 0 to 100: Range of toco waveform

Short duration: Toco waveform of short duration

Normal duration: Normal duration of toco waveform

Increased duration: Long duration of toco waveform

Uterine level = zero:

Zero toco channel (automatic on power up)

Uterine static + 20: Increase toco static level by 20 mmHg (0 mmHg to 100 mmHg)

Increase resting tone: Resting tone increases

Couping: 2 close toco waves

Tripling: 3 close toco waves

Uterine pressure sensitivity: 5  $\mu$ V or 40  $\mu$ V on power up

**Important notes:** US-1 tracks the fetal ECG rates. US-2 is the second ultrasound channel with a normal fetal ECG pattern. On the fetal and maternal ECG, the fetal ECG is 1/4 the size of the maternal ECG.

### The PS320 turns on in the following state:

- Fetal ECG static rate @ 150 BPM
- US-1 tracks @ 150 BPM
- US-2 normal pattern
- Pressure sensitivity @ 5  $\mu$ V/mmHg
- Pressure/Toco set to zero
- Maternal ECG rate @ 80 BPM
- ECG sensitivity @ 1 mV
- Toco wave is normal duration @ 0 to 50 divisions (i.e. 0 mmHg to 50 mmHg)

### Controls

#### Display

2-line x 16-character LCD with keypad

#### RS-232

Bidirectional interface, 9600 Baud

#### Power

9 V battery/battery eliminator; low battery indication set at 6 V

#### Housing

Plastic case

#### Dimensions (LxWxH)

15.6 cm x 9.4 cm x 3.4 cm  
(6.1 in x 3.7 in x 1.3 in)

#### Weight

0.4 kg (0.9 lb)

#### Temperature

##### 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

**2583030** PS320 Fetal Simulator

### Kit #1: GE Corometrics

**2794057** PS320 Fetal Monitoring Kit, GE Corometrics

#### Includes

**2583030** PS320 Fetal Simulator (includes Operator Manual (2631693), Battery Eliminator (2647372), 9 V Battery)

**2651757** MFH-1 Mechanical Fetal Heart Probe [includes Fetal Heart Cable (2462123)]

**2397628** Soft-Sided Carrying Case for kit

**2462217** 17291 RS-232 Cable, PS320/420

**2462484** Corometrics Ultrasound Simulation Cable

**4021537** Corometrics 120 Ultrasound cable

**2462469** Corometrics IUP Simulation Cable

**2462519** Corometrics TOCO Simulation Cable

### Kit #2: Hewlett-Packard, Agilent, Philips Medical

**2794069** PS320 Fetal Monitoring Kit, Series 50/8040 Philips Medical, Hewlett-Packard, Agilent

#### Includes

**2583030** PS320 Fetal Simulator (includes Operator Manual (2631693), Battery Eliminator (2647372), 9 V Battery)

**2651757** MFH-1 Mechanical Fetal Heart Probe [includes: Fetal Heart Cable (2462123)]

**2397628** Soft-Sided Carrying Case for kit

**2462217** RS-232 Cable, PS320/420

**2462478** HP/AG/PHILIPS (50 SERIES) Ultrasound Simulation Cable PS320

**2462491** HP/AG/PHILIPS (50 SERIES) EXT TOCO Simulation Cable PS320

**2462528** HP/AG/PHILIPS (50 & 8040 SERIES) IUP Simulation Cable PS320

**2462537** HP (8040 SERIES) Ultrasound Simulation Cable PS320

**2462543** HP (8040 SERIES) EXT TOCO Simulation Cable PS320

### Kit #3: Oxford Medical

**2794078** PS320 Fetal Monitoring Kit, Oxford Medical

#### Includes

**2583030** PS320 Fetal Simulator (includes Operator Manual (2631693), Battery Eliminator (2647372), 9 V Battery)

**2651757** MFH-1 Mechanical Fetal Heart Probe [includes: Fetal Heart Cable (2462123)]

**2397628** Soft-Sided Carrying Case for kit

**2462217** RS-232 Cable, PS320/420

**2462570** OXFORD IUP Simulation Cable PS320

**2462562** OXFORD Ultrasound Simulation Cable 2 MHz (blue) PS320

**2462555** OXFORD Ultrasound Simulation Cable 1.5 MHz (yellow) PS320

## Ordering information continued

### Standard accessories

**2631717** Electronic-Version Users Manual (CD-ROM)

**2631693** Printed-Version Users Manual

**2647372** Battery Eliminator Universal 90 V to 240 V

**N/A** 9 V Battery

### Optional accessories

**2647372** Battery Eliminator 100 V ac to 240 V ac

**2462177** Carrying Case, double pocket

**2462478** HP/Ag/Philips 50 Series -Ultrasound Cable

**2462491** HP/Ag/Philips 50 Series TOCO -External Cable

**2462528** HP/Ag/Philips 50 & 8040 Series -IUP Cable

**2462469** Corometrics -IUP Cable

**2462484** Corometrics -Ultrasound Cable

**4021537** Corometrics 120 Ultrasound Cable

**2462519** Corometrics TOCO -IUP Cable

**2462537** HP (8040 Series) Ultrasound Simulation Cable

**2462543** HP (8040 Series) ext TOCO Simulation Cable

**2462555** Oxford Ultrasound Simulation Cable 1.5 MHz (yellow)

**2462562** Oxford Ultrasound Simulation Cable 2.0 MHz (blue)

**2462570** Oxford IUP Simulation Cable

**2462217** RS-232 Cable

**2651757** Mechanical Fetal Heart Probe

**2462123** Mechanical Fetal Heart Cable

**2670221** PS320 Service and Calibration Manual

### About Fluke Biomedical

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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 and ISO 13485 medical device certified and our products are:

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