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$^1$ www.protekmedical.com  
$^2$ www.civcomedical.com
ACUSON P300 Ultrasound System

INTRODUCTION

The ACUSON P300™ ultrasound system is a high-performance compact diagnostic ultrasound that provides many advanced technologies standard with purchase, and a broad transducer suite to support individual and diverse practices, from traditional applications to specialty markets. The system is ergonomically designed for comfort and is backed by the Siemens service team for peace of mind.

Complete patient care solution

- Standard package includes high-end image optimization functionalities to support traditional and specialty applications needs
- Optimized for applications in musculoskeletal (MSK), breast, small parts, cardiology, general imaging and OB/GYN
- Wide selection of Linear, Convex, Phased, Laparoscopic, Intraoperative and Endocavity probes

Portability with ease

- Sleek design, easy to move and maneuver with convenient cord management system
- Integrated power supply
- Two transducer ports

Support you can count on

- Backed by Siemens standard process for service and support and clinical applications
- Access to the Siemens global network of technical and application expertise to ensure optimal system performance
- A standard 2-year factory warranty* and flexible service options to meet your unique needs

EXTENDING TECHNOLOGIES

High frequency imaging

- Up to 18.0 MHz bandwidth on linear transducers to provide detailed and precise imaging, especially in superficial investigations such as MSK application
- Multiple transmission frequency to scan deeper structures without changing probes

TEI

- Harmonic imaging: dedicated hardware and software processing the second harmonic frequencies improving B-mode image quality, and diagnostic confidence in technically difficult patients
- Available on all imaging transducers
- Three selectable frequencies; General, Resolution, Penetration
- Available in combination with Color Doppler (C), M-mode, Power Doppler

XView

- Speckle reduction: elaborates pattern of single frame at the pixel level, eliminating speckle and noise artifacts, dynamically enhancing tissue margins, improving tissue conspicuity
- Customizable presets (X Smooth, X Detail, X Enhancement) enable real-time optimization of the image process algorithm

* Including system parts and system specific transducers, excluding specialty transducers and accessories.
MView
- Spatial compounding: combined contributions of standard and steered ultrasound beams to optimize image quality and improve detection of anatomical structures
- Up to 15 angles of view within the same image

TPView
- Trapezoid imaging: enlarged field of view on all linear probes, allowing scanning of extended structures without losing resolution
- Specially suited for breast, vascular, musculoskeletal, and thyroid applications

VPan
- Panoramic view: dedicated software merging multiple B-mode images into one panned image displayed on the screen in real-time; auto fit of composite, image zoom, merging level, frame marker, colorize, and distance measurement
- Extended field of view supports visualization of the entire organ. Areas of interest such as musculoskeletal and lesions associated with abdominal, breast and small parts can be more easily studied

APPLICATION USAGE
The ACUSON P300 ultrasound system is specifically designed for the following applications:
- Abdominal (Adult, Pediatric, Neonatal)
- Adult Transcranial
- Breast
- Cardiac (Adult, Pediatric, Neonatal)
- Emergency
- General Imaging
- Gynecology
- Intraoperative/Interventional
- Musculoskeletal
- OB/GYN
- Small Parts
- Vascular

SYSTEM OVERVIEW

Control Panel
- Ergonomically designed and illuminated for ease of use
- Full alphanumeric QWERTY keyboard
- Logical grouped controls
- Customizable keys
- Dedicated technology buttons; 2D, M-mode, C, PW, CW
- Dedicated function keys; Start/End exam, Menu, Probe/User preset selection, Archive review, Exam review, Mark, Report, Measurement, Line/Update (split modes), Dual imaging, Image store, Clip store, Options key (Annotations, ECG, VTR, Power and Edit ID), Auto/Gain, Action, Rec/Print, Depth/Zoom, 8 TGC
- Siemens Select key (S) managing operation-dependent software keys and special functions on screen
- Integrated speakers
- Dedicated footswitch connector

Cart Design
- Ergonomic and compact for easy maneuverability
- Four probe holders plus one Pencil probe holder
- One gel holder
- ECG cable holders
- Probe and ECG cable management system
- Multi-directional wheels with breaking mechanism and locking levers
- Height adjustable for maximum ergonomics
- On-board peripheral storage
- Foot rest for added comfort
- Rubber bumpers to prevent wall contact

Monitor
- 15” XVGA LCD monitor (1024x768 aspect ratio)
- Contrast digital adjustment
Information displayed on monitor:
- Application
- Selected preset
- On-line help for measurements
- Date & hour
- Type of probe
- Probe orientation
- Operating frequency range
- Acoustic power output
- Gray map
- Dynamic range
- Compression
- Persistence
- Enhancement
- XView
- MView
- Depth
- Focus
- Doppler angle
- Color & Spectral Doppler filter
- Sample volume size
- PRF
- Gain
- 2d
- C
- PW/CW frame rate
- Biopsy line
- Patient data
- Hospital data and annotations
- Body markers
- Remote digital printing and storage status
- Remote DICOM printing and storage status
- Heartbeat
- Timer
- Sweep time indication on trace
- Icons on top right for XView
- AutoAdjust
- MView

Operating Modes
- 2D (B-mode)
- B-mode steering
- B-mode AutoAdjust
- Colorize 2D, M-mode and PW/CW
- PW/CW Doppler
- Non-imaging CW
- PW/CW Doppler AutoAdjust
- C (Color Doppler)
- TEI (Harmonic Imaging)
- TPView (Trapezoid Imaging)
- VPan (Panoramic Imaging)
- Bidirectional Power Doppler

Image Display Modes
- 256 gray levels or B-color levels
- 32 bits Color levels
- Orientation: Left/Right, Up/Down
- Real-time Triplex mode
- 2D+2D (with or without C or PWR D)
- 2D+M-mode (update or Real-time Duplex)
- 2D+C+M-mode (update)
- 2D+Doppler (update or Real-time Triplex)
- 2D+PWR D
- 2D+PWR D+Doppler (update or Real-time Triplex)
- Colorize on all combinations

Image Formats
- Imaging: Full, Split, Multiple, Left/Right, Up/Down
- Tracing: Split, Dual (scroll by line)

Modularity
- Software options
- Application license

Transducer Formats
- Multi-frequency electronic: Convex array, Phased array, Linear array, and Pencil CW
Operating Console
- Digital modular platform
- Dynamic range up to 210 dB
- User presets (unlimited customizable) for every probe and application

Front End
Transmit
- Ultrasound beam generation pulses with:
  - Delay: up to 13µs (step ≤ 12.5 ns)
  - Focal points: up to 8 for every probe
  - Bipolar wave
  - Frequencies: from 1.0 MHz up to 18.0 MHz
  - Programmable number of cycles
  - CW generation capability
  - Programmable aperture

Receive
- Digital beam former

RF Signal processing
- Interpolated data RF lines generation capability
- Up to 2 digital chain beam for each channel
- Imaging filters up to 128 taps digital dynamic filter
- Second Harmonic Imaging (TEI)

Back End
2D
- Field of view: 30° – 90° on Phased array
- Probe depending formats: Phased array, Linear array (with steering), Convex array
- Depth: 20 – 360 mm depending on probe
- Digital scan converter with bilinear interpolation process (640x480x8)
- Acoustic lines: up to 512
- Data dynamic: 8 bit
- Acoustic frame rate: > 200 Hz (Probe and FOV dependent)

Doppler PW
- Frequencies: 2.0 – 8.0 MHz (2.0, 2.5, 2.9, 3.3, 5.0, 6.6, 8.0 MHz)
- PRF: 2.6 – 33.3 KHz
- Multigate HPRF
- Wall filters: 50 – 1800 Hz (8 step)
- Stereophonic audio
- Sweep Time: 2 – 16 sec (step 1s)
- Spectrum: FFT with 128 frequencies, interpolated up to 512 points (analysis time: ≤1 ms)
- Sample Size: 1 – 24 mm

Maps: up to 5 post processing gray maps, up to 7 color tint scales
Zoom: variable magnification up to 4x (Real-time) and up to 32x (Frozen)
XView processing (Speckle Reduction Algorithm)
PRF: up to 11 KHz
Biopsy kits and display lines
Gain and TGC auto-adjustment
- Angle correction: ±75°
- Steering (linear probes): 3 steps (6°/12°/18°)
- Doppler gain and scale auto-adjustment
- Real-time Automatic Doppler Measurements (in non cardiac applications)

**Doppler CW**
- Frequencies: 2.0 – 5.0 MHz (2.0, 2.5, 3.3, 5.0 MHz)
- Wall filters: 50 – 1800 Hz (8 step)
- Data dynamic: 8 bit
- Stereophonic audio
- Sweep Time: 2 – 16 sec (step 1s)
- Spectrum: FFT with 128 frequencies, interpolated up to 512 points (analysis time: ≤1 ms)
- Velocity range: up to ±6.42 m/s (@ 2.0 MHz)
- Angle correction: ±75°

**Echo Process Controls**
- Power: up to 30 dB
- Imaging compression: 30 – 60 dB
- Doppler compression: 20 – 40 dB
- Imaging gain: 60 dB (TGC + general)
- C gain: 30 dB
- Doppler PW gain: 25 dB
- Doppler CW gain: 25 dB
- Pre processing: 16 dynamic shapes in imaging modality
- Post processing: 5 steps imaging and Doppler
- Persistence: 8 steps, depending on frame rate

**ECG**
- Type CF applied part
- Input impedance: > 10 MOhm (DC)
- CMMR: > 90 dB (50 Hz)
- DC max: 300 mV
- Leakage current: < 10 µA
- Time constant: 3.3 s ± 10%
- H.R. detection range: 40 – 240 bpm

**Archiving Capabilities**
- Still image (full resolution)
- Clip (full resolution)
- Graphic overlays
- Reports
- Offline capability
- Compressed images and clips
- Cine Memory: 256 MB (store capacity is 400 frames) continuous loop with different modes (single, dual, split), including Time/ECG triggered loop and frame-by-frame feature
- PC: ≥ 512 MB local drive
- Hard disk: ≥ 250 GB
- DVD reader/writer
- Internal patient database
- User selectable filter for database searches
- Still image and loop storage in DICOM formats
- Real-time still frames and video clips
- Stored data thumbnails always displayed on the side of the screen
- Measurement and Annotation on stored images
- IHE Compliant

**Connectivity**
- I/Os connectors
  - Serial RS-232
  - LAN RJ45
  - 3 USB (for image transfer)
- Dedicated connectors
  - Audio input/output (stereo)
  - ECG input
  - Double foot switch
  - External trigger input

**Image File Formats**
- Standard output: BMP, JPEG, PNG, AVI
- Native and DICOM
- Clips characteristics
• AVI Codec: Microsoft® MPEG4-V2 (highly compressed), MS-WMV9 (improved compatibility) and MS-Video1 (low level compression)
• Still frames: lossy compressed (about 70% of quality) and not compressed: BMP, JPEG, PNG
• Graphic overlays
• Reports

**Video I/O**

• XVGA output (auxiliary monitor)
• S-Video (S-VHS) input/output
• C-Video (VHS) input
• RGB (TV standard)
• Video standard: PAL / NTSC (software controlled)

**Printing**

• Ink jet color or Laser B/W & Color USB Printer (1,2,4 and 6 images printed out on A4 format-8.5x11 inch)
• Thermal B/W and Color Video Printers
• Thermal Digital B/W and Color Printers

**Video Requirements**

**RGB Printer**

• Input: RGB SYNC
• RGB (analog): 0,7 Vp-p, 75 ohm
• SINC: 5 Vp-p
• Connectors: Standard BNC
• Safety standard: IEC 60950 or EN60601-1

**B/W Printer**

• Input: Video Composite (1 Vp-p, 75 ohm)
• Connectors: Standard BNC
• Safety standard: IEC 60950 or EN60601-1

**Video Tape Recorder**

I/O video: YC

• Y: 1 Vp-p, 75 ohm
• C: 0,3 Vp-p Color burst, 75 ohm
• Tape format: VHS, S-VHS
• Audio traces: 2

• Video Conn: 4 pin connector
• Audio Conn: Jack
• SINC: 5 Vp-p
• Safety standard: IEC 60950 or EN60601-1

**DICOM Classes**

• DICOM Media Storage
• DICOM Store SCU
• DICOM Print
• DICOM Modality Worklist (MWL)
• DICOM Modality Performed Procedure Step (MPPS)
• DICOM Storage Commitment (SC)

**Software**

• Operating system: WIN XP Embedded
• Multi-language operation menus (English, Italian, French, German, Spanish)
• Reports, calculations and measurements (application dependent)
• Biometry (On/Off-line report)
• DVD upgrading capability

**Safety Requirements**

• EN 60601-1
• EN 60601-1-1
• EN 60601-1-2
• EN 60601-1-4
• EN 60601-2-37
• ENISO 10993-1
• EN 61157
• AIUM / NEMA UD-2 / UD-3 – FDA 510(k) Track 3

**Dimensions and Weights**

**System**

**Dimensions**

• Closed: 35 (L) x 18 (H) x 49 (D) cm
• In working position: 35 (L) x 43 (H) x 49 (D) cm

**Weight**

• 9 kg (w/o battery pack)
**Cart**

**Dimensions**
- 51 (W) x 84-106.6 (H) x 65.4 (D) cm

**Weight**
- 24 kg

**Power Supply (mains)**
- Voltage operative range: 100 – 240 V
- Working frequency range: 50 – 60 Hz
- Power consumption: ≤ 250 VA

**Battery**
- Two removable Li-ion batteries
- Operating time: 1 hour and 20 min
- Recharging time: 100% = 3 hours and 30 min
- After 300 cycles remains 80% of maximum charge
- Nominal operating voltage is 14.4V
- Capacity: 6.6A
- Power: 95W

**Power Cables**

**CEE**
- Socket: 510 IEC 320/C13 type: 10A-250V
- Plug: VII (7) VII type: 10A-250V
- Conductors: 3
- Section: 1 mm2
- Length: 2.5 m

**CEI**
- Socket: 510 IEC 320/C13 type: 10A-250V
- Plug: I/3 CEI 23-16 type: 10A-250V
- Conductors: 3
- Section: 1 mm2
- Length: 2.5 m

**NEMA**
- Socket type and amperage: 510 IEC 320/C13 type: 13A-125V
- Plug type: NEMA 5-15; 13A-125V
- Conductors: 3

**Operating Requirements**
- Temperature: 15° – 35°C
- Humidity: 15 – 95% (not condensing)
- Pressure: 700 – 1060 hPa

**Storage Requirements**
- Temperature: -20° – +60°C
- Humidity: 5 – 95% (not condensing)
- Pressure: 700 – 1060 hPa

**MEASUREMENTS AND REPORTING**

**Standard System Packages**
- Abdomen
- Breast
- Cardiology
- Gynecology
- Obstetric with programmable tables
- Pediatric
- Small Parts
- Thyroid
- Transcranial
- MSK
- Vascular
- Standard biometry reports and user customizable reports
- All reports are automatically stored on the system in the patient file

**Advanced Optional Packages**
- Cardiac
- OB/GYN
- All reports are automatically stored on the system in the patient file
- Archiving of structured reports requires the purchase of the DICOM module
- Refer to the operations manual for advanced measurement and report detail
### Generic Measurements

#### General Imaging

The General Imaging license comes standard with the system and enables the abdominal, breast, thyroid, small parts, musculoskeletal, and pediatric applications.

#### B-mode

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Calculation</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance</td>
<td>Distance</td>
<td>Distance</td>
</tr>
<tr>
<td>D-Ratio</td>
<td>Distance ratio</td>
<td>Two distances</td>
</tr>
<tr>
<td>% Diam</td>
<td>Diameter reduction</td>
<td>Two distances</td>
</tr>
<tr>
<td>Vx-Length</td>
<td>Length (rectilinear approximation)</td>
<td>More distances</td>
</tr>
<tr>
<td>Tr-Length</td>
<td>Length (Profile)</td>
<td>Distance</td>
</tr>
<tr>
<td>A-Ellipse</td>
<td>Area (Ellipse)</td>
<td>Distance, Area</td>
</tr>
<tr>
<td>Vx-Area</td>
<td>Area (rectilinear approximation)</td>
<td>More distances</td>
</tr>
<tr>
<td>Tr-Area</td>
<td>Area (Profile)</td>
<td>Profile</td>
</tr>
<tr>
<td>A-Ratio</td>
<td>Areas ratio</td>
<td>Two areas (on a profile)</td>
</tr>
<tr>
<td>% Area</td>
<td>Reduction area</td>
<td>Two areas (on a profile)</td>
</tr>
<tr>
<td>EI-Volume</td>
<td>Volume (Ellipse)</td>
<td>Distance, Area</td>
</tr>
<tr>
<td>Tri-Volume</td>
<td>Volume (Profile)</td>
<td>Profile, Distance</td>
</tr>
<tr>
<td>Bi-Volume</td>
<td>Volume (Axes)</td>
<td>Three distances</td>
</tr>
</tbody>
</table>

#### M-mode

<table>
<thead>
<tr>
<th>Parameter</th>
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<th>Measure</th>
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<tbody>
<tr>
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<td>Distance</td>
</tr>
<tr>
<td>D-Ratio</td>
<td>Distance ratio</td>
<td>Two distances</td>
</tr>
<tr>
<td>Time</td>
<td>Time</td>
<td>Time</td>
</tr>
<tr>
<td>% Time</td>
<td>Time ratio</td>
<td>Two times</td>
</tr>
<tr>
<td>HR</td>
<td>Heart rate</td>
<td>Distances</td>
</tr>
<tr>
<td>Velocity</td>
<td>Velocity</td>
<td>Velocity</td>
</tr>
<tr>
<td>% Velocity</td>
<td>Velocity ratio</td>
<td>Two velocities</td>
</tr>
</tbody>
</table>

#### Doppler

<table>
<thead>
<tr>
<th>Parameter</th>
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</thead>
<tbody>
<tr>
<td>Time</td>
<td>Time</td>
<td>Time</td>
</tr>
<tr>
<td>% Time</td>
<td>Time ratio</td>
<td>Two times</td>
</tr>
<tr>
<td>Velocity</td>
<td>Velocity</td>
<td>Velocity</td>
</tr>
<tr>
<td>% Velocity</td>
<td>Velocity ratio</td>
<td>Two velocities</td>
</tr>
<tr>
<td>HR</td>
<td>Heart rate</td>
<td>Time</td>
</tr>
<tr>
<td>FVI</td>
<td>Vascular FVI</td>
<td>Spectral envelope</td>
</tr>
<tr>
<td>PI</td>
<td>Pulsatility index</td>
<td>Spectral envelope</td>
</tr>
<tr>
<td>RI</td>
<td>Resistive index</td>
<td>Two velocities</td>
</tr>
<tr>
<td>Tr-Flow</td>
<td>Flow (Profile)</td>
<td>Velocity, Profile</td>
</tr>
<tr>
<td>EI-Flow</td>
<td>Flow (Ellipse)</td>
<td>Velocity, Profile</td>
</tr>
<tr>
<td>D-flow</td>
<td>Flow (Diameter)</td>
<td>Velocity, Distance</td>
</tr>
</tbody>
</table>
**Vascular**
The Vascular imaging license comes standard with the system.

### B-mode

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<td>D-Ratio</td>
<td>Distance ratio</td>
<td>Two distances</td>
</tr>
<tr>
<td>% Diam</td>
<td>Diameter reduction</td>
<td>Two distances</td>
</tr>
<tr>
<td>Tr-Area</td>
<td>Area (Profile)</td>
<td>Profile</td>
</tr>
<tr>
<td>A-Ratio</td>
<td>Areas ratio</td>
<td>Two areas (on a profile)</td>
</tr>
<tr>
<td>% Area</td>
<td>Area reduction</td>
<td>Two areas (on a profile)</td>
</tr>
<tr>
<td>Velocity</td>
<td>Velocity</td>
<td>Velocity</td>
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<tr>
<td>% Velocity</td>
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### Doppler

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<tr>
<td>Time</td>
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<tr>
<td>% Time</td>
<td>Time ratio</td>
<td>Two times</td>
</tr>
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<td>Velocity</td>
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<td>Resistive index</td>
<td>Two velocities</td>
</tr>
<tr>
<td>Tr-Flow</td>
<td>Flow (Profile)</td>
<td>Velocity, Profile</td>
</tr>
<tr>
<td>El-Flow</td>
<td>Flow (Ellipse)</td>
<td>Velocity, Profile</td>
</tr>
<tr>
<td>D-Flow</td>
<td>Flow (Diameter)</td>
<td>Velocity, Distance</td>
</tr>
</tbody>
</table>

### Cardiology

The Cardiology imaging license is an option purchase. Advanced measurements and reporting can be found in the operations manual.

### B-mode

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<tr>
<td>Tr-Area</td>
<td>Area (Profile)</td>
<td>Profile</td>
</tr>
<tr>
<td>Tr-Volume</td>
<td>Volume (Profile)</td>
<td>Profile, Distance</td>
</tr>
<tr>
<td>E-Ratio</td>
<td>Area ratio</td>
<td>Two areas (ellipse based)</td>
</tr>
<tr>
<td>% Velocity</td>
<td>Velocity ratio</td>
<td>Two velocities</td>
</tr>
<tr>
<td>% Velocity</td>
<td>Velocity ratio</td>
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### M-mode

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<td>Heart rate</td>
<td>Time</td>
</tr>
<tr>
<td>Velocity</td>
<td>Velocity</td>
<td>Velocity</td>
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</table>
### Doppler

<table>
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<th>Calculation</th>
<th>Measurement</th>
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<tbody>
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</tr>
<tr>
<td>Velocity</td>
<td>Velocity</td>
<td>Velocity</td>
</tr>
<tr>
<td>HR</td>
<td>Heart rate</td>
<td>Time</td>
</tr>
<tr>
<td>C-FVI</td>
<td>FVI</td>
<td>Spectral envelope</td>
</tr>
<tr>
<td>Slope</td>
<td>Slope</td>
<td>Slope</td>
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</table>

### OB-Fetal

The OB imaging license is an optional purchase. Advanced measurements and reporting can be found in the operations manual.

### B-mode

<table>
<thead>
<tr>
<th>Parameter</th>
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<th>Measure</th>
</tr>
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<tbody>
<tr>
<td>Distance</td>
<td>Distance</td>
<td>Distance</td>
</tr>
<tr>
<td>D-Ratio</td>
<td>Distance ratio</td>
<td>Two distances</td>
</tr>
<tr>
<td>Vx-Length</td>
<td>Length (approximately straight)</td>
<td>More distances</td>
</tr>
<tr>
<td>Tr-Length</td>
<td>Length (Profile)</td>
<td>Distance</td>
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<tr>
<td>A-Ellipse</td>
<td>Area (Ellipse)</td>
<td>Distance, Area</td>
</tr>
<tr>
<td>Vx-Area</td>
<td>Area (approximately straight)</td>
<td>More distances</td>
</tr>
<tr>
<td>Tr-Area</td>
<td>Area (Profile)</td>
<td>Profile</td>
</tr>
<tr>
<td>A-Ratio</td>
<td>Areas ratio</td>
<td>Two areas (on a profile)</td>
</tr>
<tr>
<td>EI-Volume</td>
<td>Volume (Ellipse)</td>
<td>Distance, Area</td>
</tr>
<tr>
<td>Tr-Volume</td>
<td>Volume (Profile)</td>
<td>Profile, Distance</td>
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<tr>
<td>Bi-Volume</td>
<td>Volume (Axes)</td>
<td>Three distances</td>
</tr>
<tr>
<td>E_Ratio</td>
<td>Area ratio</td>
<td>Two areas (ellipse based)</td>
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### M-mode

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<td>Distance</td>
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<tr>
<td>D-Ratio</td>
<td>Distance ratio</td>
<td>Two distances</td>
</tr>
<tr>
<td>Time</td>
<td>Time</td>
<td>Time</td>
</tr>
<tr>
<td>% Time</td>
<td>Time ratio</td>
<td>Two times</td>
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<tr>
<td>HR</td>
<td>Heart rate</td>
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<tr>
<td>Velocity</td>
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<td>% Velocity</td>
<td>Velocity ratio</td>
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<td>PI</td>
<td>Pulsatility index</td>
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<tr>
<td>RI</td>
<td>Resistive index</td>
<td>Two velocities</td>
</tr>
<tr>
<td>Tr-Flow</td>
<td>Flow (Profile)</td>
<td>Velocity, Profile</td>
</tr>
<tr>
<td>EI-Flow</td>
<td>Flow (Ellipse)</td>
<td>Velocity, Profile</td>
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<tr>
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<td>Flow (diameter)</td>
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<td>Flow (Diameter)</td>
<td>Velocity, Distance</td>
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# TRANSDUCERS

ACUSON P300 system supports the following transducers and applicable intended clinical use:

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<th>Transducer</th>
<th>ABD</th>
<th>AC</th>
<th>BRE</th>
<th>CAR</th>
<th>CP</th>
<th>GYN</th>
<th>MSK</th>
<th>NC</th>
<th>OB</th>
<th>PED</th>
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</tr>
</tbody>
</table>

**ABD**: Abdominal; **AC**: Adult Cephalic; **BRE**: Breast; **CAR**: Cardiac; **CP**: Cardiac Pediatric; **GYN**: Gynecologic; **MSK**: Musculoskeletal conventional and superficial; **NC**: Neonatal; **OB**: Obstetric; **PED**: Pediatric; **SP**: Small Parts; **THY**: Thyroid; **VAS**: Vascular.
**Probes Technical Specifications:**

**Convex Array Probes**

**CA123**
- Technology: Wideband Electronic Convex Array
- Number of elements: 128
- Depth: 0 – 140 mm
- Footprint: 14 mm radius
- Field of view: 90°
- Frequency Bandwidth: 3.0 – 9.0 MHz
- B-mode, M-mode Selectable Frequencies: 5.0, 6.6, 8.0 MHz
- TEI Frequencies: Resolution and Penetration
- C Doppler, PW Doppler Selectable Frequencies: 5.0, 6.6 MHz
- Biopsy: Disposable kit

**CA431**
- Technology: Wideband Electronic Convex Array
- Number of elements: 192
- Depth: 0 – 360 mm
- Footprint: 40 mm radius
- Field of view: 30° – 85°
- Frequency Bandwidth: 2.0 – 5.0 MHz
- B-mode, M-mode Selectable Frequencies: 2.5, 3.5, 5.0, 6.6 MHz
- TEI Frequencies: General, Penetration, and Resolution
- C Doppler, PW Doppler Selectable Frequencies: 2.5, 2.9 MHz
- Biopsy: Disposable kit

**Linear Array Probes**

**LA522**
- Technology: Wideband Electronic Linear Array
- Number of elements: 192
- Depth: 0 – 120 mm
- Footprint: 50 mm x 8 mm
- Frequency Bandwidth: 5.0 – 9.0 MHz
- B-mode, M-mode Selectable Frequencies: 5.0, 7.5, 10.0, 12.0 MHz
- TEI Frequencies: Penetration and Resolution
- C Doppler, PW Doppler Selectable Frequencies: 3.3, 5.0 MHz
- Steered angle: 7 steps
- Biopsy: Multi angle reusable autoclave sterilized adaptor

**LA435**
- Technology: Wideband Electronic Linear Array
- Number of elements: 192
- Depth: 0 – 90 mm
- Footprint: 40 mm x 5 mm
- Frequency Bandwidth: 6.0 – 18.0 MHz
- B-mode, M-mode Selectable Frequencies: 10.0, 12.0, 15.0, 18.0 MHz
- TEI Frequencies: Penetration and Resolution
- C Doppler, PW Doppler Selectable Frequencies: 6.6, 8.0 MHz
- Steered angle: 7 steps
- Biopsy: Multi angle reusable autoclave sterilized adaptor

**LA523**
- Technology: Wideband Electronic Linear Array
- Number of elements: 192
- Depth: 0 – 120 mm
- Footprint: 50 mm x 8 mm
- Frequency Bandwidth: 4.0 – 13.0 MHz
- B-mode, M-mode Selectable Frequencies: 7.5, 10.0, 12.0 MHz
- TEI Frequencies: Penetration and Resolution
- C Doppler, PW Doppler Selectable Frequencies: 5.0, 6.6 MHz
- Steered angle: 7 steps
- Biopsy: Multi angle reusable autoclave sterilized adaptor, disposable kit
Phased Array Probes

PA230
- Technology: Wideband Electronic Phased Array
- Number of elements: 128
- Depth: 0 – 360 mm
- Footprint: 14 mm x 23 mm
- Field of view: 15° – 90°
- Frequency Bandwidth: 1 – 4 MHz
- B-mode, M-mode Selectable Frequencies: 2.0, 2.5, 3.5 MHz
- TEI Frequencies: General, Penetration, Resolution
- Color Doppler, PW Doppler Selectable Frequencies: 2.0, 2.5 MHz
- Biopsy: Not Available

PA122
- Technology: Wideband Electronic Phased Array
- Number of elements: 128
- Depth: 0 – 270 mm
- Footprint: 10 mm x 16 mm
- Field of view: 15° – 90°
- Frequency Bandwidth: 3.0 – 8.0 MHz
- B-mode, M-mode Selectable Frequencies: 4.0, 5.0, 7.5 MHz
- TEI Frequency: NA
- Color Doppler, PW Doppler Selectable Frequencies: 5.0 MHz
- Biopsy: Not Available

PA023
- Technology: Wideband Electronic Phased Array
- Number of elements: 128
- Depth: 0 – 270 mm
- Footprint: 6 mm x 13 mm
- Field of view: 15° – 90°
- Frequency Bandwidth: 4.0 – 11.0 MHz
- B-mode, M-mode Selectable Frequencies: 7.5, 10.0 MHz
- TEI Frequencies: NA
- Color Doppler, PW Doppler Selectable Frequencies: 5.0 MHz
- Biopsy: Not Available

Specialty Probes

EC1123
- Technology: Wideband Electronic end fire microConvex
- Number of elements: 192
- Depth: 0 – 170 mm
- Footprint: 13 – 10 mm radius
- Field of view: 30° – 195°
- Frequency Bandwidth: 3.0 – 9.0 MHz
- B-mode, M-mode Selectable Frequencies: 4.0, 5.0, 6.6, 8.0 MHz
- TEI Frequencies: Resolution
- Color Doppler, PW Doppler Selectable Frequencies: 5.0, 6.6 MHz
- Biopsy: Single and disposable use adaptor

IOE323
- Application: Intraoperative
- Technology: Wideband Electronic Linear Array
- Depth: 0 – 90 mm
- Footprint: 30 mm
- Frequency Bandwidth: 4.0 – 13.0 MHz
- B-mode, M-mode Selectable Frequencies: 5.0, 7.5, 12.0 MHz
- TEI Frequencies: Penetration and Resolution
- Color Doppler, PW Doppler Selectable Frequencies: 5.0, 6.6 MHz
- Biopsy: Multi angle reusable autoclave sterilized adaptor
LP323

- Application: Laparoscopic
- Technology: Wideband Electronic Linear Array
- Depth: 0 – 90 mm
- Frequency Bandwidth: 4.0 – 13.0 MHz
- B-mode, M-mode Selectable Frequencies: 5.0, 7.5, 12.0 MHz
- TEI Frequencies: Penetration and Resolution
- C Doppler, PW Doppler Selectable Frequencies: 5.0, 6.6 MHz
- Articulation ± up/down 90°
- Articulation ± right/left 90°
- Biopsy: Not Available

Non-Imaging Pencil probe

2 MHz CW Doppler
- Number of elements: 2
- C Doppler, PW Doppler Frequencies: 2.0 MHz

5 MHz CW Doppler
- Number of elements: 2
- C Doppler, PW Doppler Frequencies: 5.0 MHz

Biopsy Kits

The following kits are available:

<table>
<thead>
<tr>
<th>Biopsy adaptor</th>
<th>Probe</th>
<th>Kit contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABS421</td>
<td>CA431</td>
<td>1 20° coupling, 1 30° coupling+ 5 needle guides</td>
</tr>
<tr>
<td>ABS523</td>
<td>LA523</td>
<td>1 coupling (45° angle) + 5 needle guides</td>
</tr>
<tr>
<td></td>
<td>LA522</td>
<td></td>
</tr>
<tr>
<td>ABS424</td>
<td>LA435</td>
<td>1 coupling (45° angle) + 5 needle guides</td>
</tr>
<tr>
<td>ABS15</td>
<td>IOE323</td>
<td>1 coupling (45° angle) + 5 needle guides</td>
</tr>
</tbody>
</table>

Disposable Needle Guides by Protek

All kits are provided with 12–23 gauge needle guides. Each kit contains sterile probe covers, sterile needle guides, sterile gel and sterile elastic bands plus a non-sterile mounting bracket and a non-sterile verification kit. The sterile needle guides are of different colors to match the needle to be used. The needle guides are sterile, but, they cannot be re-sterilized.

<table>
<thead>
<tr>
<th>Probe</th>
<th>Fixed Angle</th>
<th>Manufacturer’s Kit P/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA123</td>
<td>15°</td>
<td>7356</td>
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<tr>
<td>CA431</td>
<td>20°</td>
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<td>30°</td>
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<td>LA435</td>
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<td>LA522</td>
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<td>7351</td>
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<td>75°</td>
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<tr>
<td>EC1123</td>
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<td>6360</td>
</tr>
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Disposable Needle Guides by CIVCO

Fixed Angle and Multi-Angle Kits

All kits are provided with 12–23 gauge needle guides. Each kit contains sterile probe covers, sterile needle guides, sterile gel and sterile elastic bands plus a non-sterile mounting bracket and a non-sterile verification kit. The needle guides are sterile, but, they cannot be re-sterilized.

1 www.protekmedical.com
2 www.civcomedical.com
### Free Insertion Angle Kits

The Infinity needle guide kits listed in the table below allow the user to have a free insertion angle: this can be any angle within the range edged by the guide back wall, on one side, and by the transducer itself, on the other side. The kit allows the user to keep the needle on the same scanning plane of the probe.

All kits are provided with 14 and 18 gauge needle guides. Each kit contains sterile probe covers, sterile needle guides, sterile gel and sterile elastic bands plus a non-sterile mounting bracket and a non-sterile verification kit. The needle guides are sterile but cannot be re-sterilized.

<table>
<thead>
<tr>
<th>Probe</th>
<th>Insertion Angle Range</th>
<th>Manufacturer’s Kit P/N</th>
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</thead>
<tbody>
<tr>
<td>CA431</td>
<td>42° – 64°</td>
<td>639-014</td>
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<tr>
<td>LA435</td>
<td>42° – 80°</td>
<td>639-021</td>
</tr>
<tr>
<td>LA522</td>
<td>42° – 80°</td>
<td>639-016</td>
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<table>
<thead>
<tr>
<th>Probe</th>
<th>Fixed Angle</th>
<th>Multi-Angle</th>
<th>Manufacturer’s Kit P/N</th>
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<td>CA431</td>
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<td>70°</td>
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<td>639-022</td>
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