

SIEMENS

ACUSON P300



Datasheet

ACUSON P300™ Ultrasound System

Release 1.0

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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 13 μ s (step \leq 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)

- 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

M-mode

- Sweep time: 2 – 16 sec (step 1s)
- PRF: 1 KHz

Color

- Frequencies: 2.0 – 8.0 MHz (2.0, 2.5, 2.9, 3.3, 5.0, 6.6, 8.0 MHz)
- Sampling PRF: 350 Hz – 11 KHz
- Wall filters: 4 levels, depending on PRF
- Data dynamic: 10 bit (+5 for intensity)
- Maps: up to 16
- Frame rate: up to 40 Hz
- Frame interpolation
- Interleave: up to 16 lines
- Samples: up to 512/line
- Packet size: 4 – 28
- Format: ROI with/without wider b/w
- Size: 15-85 % of max b/w size
- Steering (linear probes): 3 steps (6°/12°/18°)

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: \leq 1 ms)
- Sample Size: 1 – 24 mm

- Angle correction : $\pm 75^\circ$
- Steering (linear probes): 3 steps ($6^\circ/12^\circ/18^\circ$)
- 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: $\pm 75^\circ$

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 μ A
- Time constant: 3.3 s $\pm 10\%$
- 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

- X VGA 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

- Section: AWG 16

- Length: 3 m

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

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

M-mode

Parameter	Calculation	Measure
Distance	Distance	Distance
Distance	Distance	Distance
D-Ratio	Distance ratio	Two distances
Time	Time	Time
% Time	Time ratio	Two Times
HR	Heart rate	Distances
Velocity	Velocity	Velocity
% Velocity	Velocity ratio	Two velocities

Doppler

Parameter	Calculation	Measure
Time	Time	Time
% Time	Time ratio	Two times
Velocity	Velocity	Velocity
% Velocity	Velocity ratio	Two velocities
HR	Heart rate	Time
FVI	Vascular FVI	Spectral envelope
PI	Pulsatility index	Spectral envelope
RI	Resistive index	Two velocities
Tr-Flow	Flow (Profile)	Velocity, Profile
EI-Flow	Flow (Ellipse)	Velocity, Profile
D-flow	Flow (Diameter)	Velocity, Distance

Vascular

The Vascular imaging license comes standard with the system.

B-mode

Parameter	Calculation	Measure
Distance	Distance	Distance
D-Ratio	Distance ratio	Two distances
% Diam	Diameter reduction	Two distances
Tr-Area	Area (Profile)	Profile
A-Ratio	Areas ratio	Two areas (on a profile)
% Area	Area reduction	Two areas (on a profile)
Velocity	Velocity	Velocity
% Velocity	Velocity ratio	Two velocities

M-mode

Parameter	Calculation	Measure
Distance	Distance	Distance
D-Ratio	Distance ratio	Two distances
Time	Time	Time
% Time	Time ratio	Two times
HR	Heart rate	Distances
Velocity	Velocity	Velocity
% Velocity	Velocity ratio	Two velocities
% Velocity	Velocity ratio	Two velocities

Doppler

Parameter	Calculation	Measure
Time	Time	Time
% Time	Time ratio	Two times
Velocity	Velocity	Velocity
% Velocity	Velocity ratio	Two velocities
HR	Heart rate	Time
FVI	Vascular FVI	Spectral envelope
PI	Pulsatility index	Spectral envelope
RI	Resistive index	Two velocities
Tr-Flow	Flow (Profile)	Velocity, Profile
EI-Flow	Flow (Ellipse)	Velocity, Profile
D-Flow	Flow (Diameter)	Velocity, Distance

Cardiology

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

B-mode

Parameter	Calculation	Measurement
Distance	Distance	Distance
Tr-Area	Area (Profile)	Profile
Tr-Volume	Volume (Profile)	Profile, Distance
E-Ratio	Area ratio	Two areas (ellipse based)

M-mode

Parameter	Calculation	Measurement
Distance	Distance	Distance
HR	Heart rate	Time
Velocity	Velocity	Velocity

Doppler

Parameter	Calculation	Measurement
Time	Time	Time
Velocity	Velocity	Velocity
HR	Heart rate	Time
C-FVI	FVI	Spectral envelope
Slope	Slope	Slope

OB-Fetal

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

B-mode

Parameter	Calculation	Measure
Distance	Distance	Distance
D-Ratio	Distance ratio	Two distances
Vx-Length	Length (approximately straight)	More distances
Tr-Length	Length (Profile)	Distance
A-Ellipse	Area (Ellipse)	Distance, Area
Vx-Area	Area (approximately straight)	More distances
Tr-Area	Area (Profile)	Profile
A-Ratio	Areas ratio	Two areas (on a profile)
EI-Volume	Volume (Ellipse)	Distance, Area
Tr-Volume	Volume (Profile)	Profile, Distance
Bi-Volume	Volume (Axes)	Three distances
E_Ratio	Area ratio	Two areas (ellipse based)

M-mode

Parameter	Calculation	Measure
Distance	Distance	Distance
D-Ratio	Distance ratio	Two distances
Time	Time	Time
% Time	Time ratio	Two times
HR	Heart rate	Distance
Velocity	Velocity	Velocity
% Velocity	Velocity ratio	Two velocities

Doppler

Parameter	Calculation	Measure
Time	Time	Time
% Time	Time ratio	Two times
Velocity	Velocity	Velocity
% Velocity	Velocity ratio	Two velocities
HR	Heart rate	Time
C-FVI	FVI	Spectral envelope
FVI	Vascular VI	Spectral envelope
PI	Pulsatility index	Spectral envelope
RI	Resistive index	Two velocities
Tr-Flow	Flow (Profile)	Velocity, Profile
EI-Flow	Flow (Ellipse)	Velocity, Profile
D-Flow	Flow (diameter)	Velocity, Distance
D-Flow	Flow (Diameter)	Velocity, Distance

TRANSDUCERS

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

	ABD	AC	BRE	CAR	CP	GYN	MSK	NC	OB	PED	SP	THY	VAS
Curved Array													
CA123			√	√	√		√	√		√	√	√	√
CA431	√					√			√	√			√
Linear Array													
LA435	√		√			√	√	√	√	√	√	√	√
LA522	√		√			√	√	√	√	√	√	√	√
LA523	√		√			√	√	√	√	√	√	√	√
Phased Array													
PA023				√	√			√		√			√
PA122	√			√	√			√		√			√
PA230	√	√		√	√	√			√	√	√		√
Specialty													
EC1123						√			√				
IOE323	√		√			√	√	√	√	√	√	√	√
LP323	√					√				√	√		√
Doppler													
2CW				√	√								
5CW													√

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: Multi angle reusable autoclave sterilized adaptor

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
- Foot print: 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
- C Doppler, PW Doppler Selectable Frequencies: 3.3 – 5.0 MHz
- Biopsy: Not Available

PA023

- Technology: Wideband Electronic Phased Array
- Number of elements: 128
- Depth: 0 – 270 mm
- Foot print: 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
- C 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
- C 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 \pm up/down 90°
- Articulation \pm 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:

Biopsy adaptor	Probe	Kit contents
ABS421	CA431	1 20° coupling, 1 30° coupling+ 5 needle guides
ABS523	LA523 LA522	1 coupling (45° angle) + 5 needle guides
ABS424	LA435	1 coupling (45° angle) + 5 needle guides
ABS15	IOE323	1 coupling (45° angle) + 5 needle guides

Disposable Needle Guides by Protek¹

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.

Probe	Fixed Angle	Manufacturer's Kit P/N
CA123	15°	7356
CA431	20°	7352
	30°	
LA435	45°	7350
LA522 LA523	45°	7351
	60°	
	75°	
EC1123	0°	6360

Disposable Needle Guides by CIVCO²

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

Probe	Fixed Angle	Multi-Angle	Manufacturer's Kit P/N
CA123		20°	639-028
		35°	
CA431	20°		639-018
	30°		
LA435		50°	639-023
		60°	
		70°	
LA523 LA522		40°	639-022
		55°	
		70°	
EC1123	3°, 8°		610-693
EC1123	0°		639-012

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.

Probe	Insertion Angle Range	Manufacturer's Kit P/N
CA431	42° – 64°	639-014
LA435	42° – 80°	639-021
LA522 LA523	42° – 80°	639-016

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Solutions USA, Inc.

Global Siemens Headquarters

Siemens AG
Wittelsbacherplatz 2
80333 Muenchen
Germany

**Global Siemens Healthcare
Headquarters**

Siemens AG
Healthcare Sector
Henkestrasse 127
91052 Erlangen
Telephone: +49 9131 84-0
Germany

www.siemens.com/healthcare

Legal Manufacturer

Siemens Medical Solutions USA, Inc.
Ultrasound
685 E. Middlefield Road
Mountain View, CA 94043
USA
Telephone: +1-888-826-9702
www.siemens.com/ultrasound