



Data sheet

# ACUSON Juniper ultrasound system

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## **ACUSON Juniper ultrasound system – Everything you need, nothing you don't**

Higher patient volumes. Larger patient sizes. Limited diagnostic certainty. In the face of these trending challenges, you need a reliable ultrasound system that can consistently deliver high-quality images across disease states – a system with optimized accessibility, expanded applications, and ease of use.

The ACUSON Juniper was designed from the ground up to offer high-fidelity transmit and receive acoustic signals that greatly reduces noise and offers premium image quality and industry leading elasticity solutions. ACUSON Juniper packs powerful capabilities into one of the industry's smallest ultrasound systems. Able to fit in virtually any hospital room, ACUSON Juniper weighs an average of 27% less and is up to 36% smaller in size than other systems in its class.

### **Introduction**

#### **Image every patient**

Delivering high-quality care means being able to scan virtually every patient regardless of their size, weight or condition. With its wide variety of clinical solutions and fast image acquisition, ACUSON Juniper can improve diagnostic confidence across all departments, from radiology, interventional radiology, and urology to cardiovascular, orthopedic, and obstetrics/gynecological imaging. This clinical versatility combined with the industry leading tissue elasticity imaging, ACUSON Juniper enables you to expand your Ultrasound clinical and service offerings across virtually all patient and case types.

#### **Focus on what matters most**

This increased clinical performance comes at no cost to the functional design of the system. With ACUSON Juniper, you and your staff can move more easily

between exams, patients, and spaces. Its 6 active ports, including 5 active transducer ports and 1 pencil port, support multiple clinical applications as you move about your day. Designed with intent, the system also adjusts to individual working preferences – pull the lightweight system from the front or back as you move between exams, tilt the monitor up or down as needed for your height, or rotate the control panel left or right depending on the patient bed location. Among the quietest ultrasound systems on the market, ACUSON Juniper creates a comfortable room environment and redefines adaptability, meeting staff preferences with ease so you can focus on what matters most – your patient.

#### **Where form meets function**

Small on the outside, yet big on the inside, ACUSON Juniper empowers you to image every patient, knowing you have the clinical information needed for confident decision making and a system designed to adapt to your everyday clinical and workflow needs.

**21.5" LCD monitor**  
Highly adjustable for maximum operator adaptability

**13.3" Touch display**  
Smart UI for quicker scan settings and protocols

**Intuitive control panel**  
Customizable height, angle and keys

**Quiet, stress-free environment**  
Bedroom-like acoustic pressure  
60% quieter than average



**Lightweight maneuverability**  
One of the easiest systems to maneuver, weighing only 76 kilos, and with both rear and front handles

**Purposeful cable management**  
Several hooks available for a clean, cable free environment

**Multiple transducer ports**  
Efficient workflow with 5 active transducer ports, 1 pencil probe and 2 physio ports

**Every detail designed to maximize productivity**  
Multiple storage bins available as well as space for easy installation of peripherals

Abdominal	<ul style="list-style-type: none"> <li>• Abdominal</li> <li>• Renal</li> <li>• Bowel</li> <li>• FAST</li> <li>• Lung</li> </ul>
Obstetrics	<ul style="list-style-type: none"> <li>• OB</li> <li>• Early OB</li> <li>• Fetal Echo</li> <li>• OB (ADV)</li> </ul>
Gynecology	<ul style="list-style-type: none"> <li>• Gyn</li> <li>• Pelvic floor</li> </ul>
Small Parts	<ul style="list-style-type: none"> <li>• Breast</li> <li>• Testis</li> <li>• Penile</li> <li>• Thyroid</li> </ul>
Pediatric	<ul style="list-style-type: none"> <li>• Pediatric Hip Joint</li> <li>• Ped Abdomen</li> </ul>

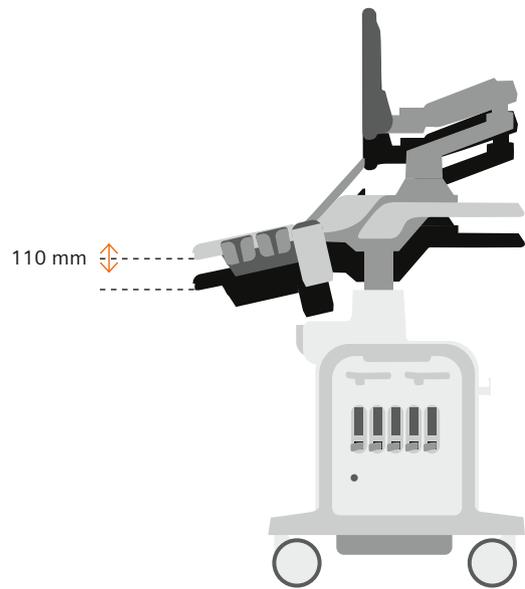
Neonatal	<ul style="list-style-type: none"> <li>• Neonatal Echo</li> <li>• Neonatal Head</li> </ul>
Vascular	<ul style="list-style-type: none"> <li>• Carotid</li> <li>• Peripheral Venous</li> <li>• Peripheral Arterials</li> <li>• TCD</li> </ul>
Urology	<ul style="list-style-type: none"> <li>• Pelvis</li> <li>• Prostate</li> </ul>
Echocardiography	<ul style="list-style-type: none"> <li>• Adult Echo</li> <li>• Pediatric Echo</li> <li>• Neonatal Echo</li> </ul>
Musculoskeletal	<ul style="list-style-type: none"> <li>• Spine</li> <li>• MSK</li> <li>• Digital</li> <li>• Nerve</li> </ul>
Intraoperative	<ul style="list-style-type: none"> <li>• IO Abdomen</li> </ul>

## System Overview

### System Architecture

Simple, intuitive user interface with home-base design minimizes repetitive hand motions and enables motor-memory learning. All-digital signal processing and multi-beam formation technology provide best-in-class imaging in all modes and enable seamless integration of features and options:

- Parallel Quad beam processing of the RF signal data in the time and amplitude domains with new generation all digital beamformer technology
  - 2D mode line density: Up to 512 lines
  - Processing channels: Up to 1032192 channels
  - Total system dynamic range: > 329 dB
- New front-end, beamformer and back-end engines for improved contrast resolution, plunkability, sensitivity and specificity
- Floating control panel allows a wide range of adjustment for operator comfort in standing and sitting positions
- Left/Right swivel articulation:  $\pm 90^\circ$
- Vertical articulation: 11 cm
- System control panel illumination via Off/White/Blue (Not used/Available/Active) backlighting
- 13.3-inch touch screen (resolution 1920 × 1080)
- Laser-optical trackball for higher sensitivity
- Digital and pull-out keyboard
- Dynamic TCE Tissue Contrast Enhancement technology, Advanced SieClear spatial compounding, SieClear compounding and Clarify Vascular Enhancement (VE) technology are built into the ACUSON Juniper system to provide excellent image quality
- Detect and prevent motion artifacts and reduce noise, simultaneously enhance color sensitivity with Dynamic Persistence proprietary technology and Auto Flash Color Artifact Suppression patent-pending technology
- Enhance productivity through application-specific imaging presets, eSieImage tissue grayscale optimization technology Doppler auto optimization, enhanced measurement and report functionality, knowledge based workflow tools including *syngo* Auto OB, Auto follicle measurements, eSie LH and standardized imaging protocols
- Improve accuracy and reproducibility with the eSie Measure workflow acceleration package
- Virtual touch quantification (VTQ) for personalized quantification of liver stiffness. This has been shown to help grade liver disease and may help physicians avoid liver biopsies in those patients that don't need them
- Streamline connectivity with solutions such as DICOM Print/Store, DICOM Modality Worklist, DICOM MPPS and DICOM structured reporting for OB/GYN, Vascular and Cardiac exams
- Increase functionality with *fourSight* 4D transducer technology, and integrated stress echo
- US security virus protection
- Anatomical M-mode (angle rotation and free hand drawing AMM)
- Full user customizable preset, measurement and reporting package
- Automatic mode switching
  - Fast system boot up: from off, approximately 90 seconds
  - Transport mode: from sleep mode to on, approximately 5 seconds
  - Transport mode lasts 30 minutes before recharge is needed



## User Interface

- On-screen text, control panel overlay and operating instructions are available in the following languages:
  - Chinese, English, French, Italian, German, Spanish
- Russian keyboard and operating instructions supported
- Operating instructions are available in 27 languages
- Thumbnail menu provides on-screen thumbnail images and dynamic clips during exams
- On-screen acoustic power indicator (AIUM/NEMA) output display standard

## Dual-Option Keyboard

- Conventional pull-out keyboard
- Touch screen keyboard

## Ergonomics

- Laser-optical trackball
- Context sensitive: Dynamic back lighting
- 5 active transducer ports
- Intuitively organized user interface
- Vertical articulation: 11 cm
- Left/Right swivel articulation:  $\pm 90^\circ$
- Ergonomic, tactile button designs
- Smart-adaptive annotations
- Smart-intuitive body markers and pictograms
- Robust selection for protocol
- Tiltable touch screen with two USB ports

## Fully Articulated Flat Panel Display

- 21.5" full HD 1080p, flat panel liquid crystal display (LCD) with LED backlighting and wide-angle
- IPS (in-plane switching) technology
- High contrast ratio 1000 : 1
- Variable monitor positioning adjustment (height, swivel, tilt)
  - Range of height: (upright FPD) 163–141 cm (64.2–55.5 in)
- Extended wide viewing angle:  $\pm 89^\circ$
- Folds down for transport
  - Minimum fold-down system height: 122 cm (48.0315 in)
- Default brightness: 170 cd/m<sup>2</sup>
- Response time: 14 ms

## Articulating Arm

- Allows monitor transition for optimal ergonomic positioning toward, away and side-to-side
- Articulation independent of system and control panel
  - Left/Right swivel articulation:  $\pm 180^\circ$  in either direction
- Horizontal articulation

## Touch Screen

- LCD (13.3", 16:9) touch panel
- Screen resolution: 1920 × 1080
- Dot pitch: 0.204 mm × 0.204 mm – USB 2.0 interface with host system
- 2 USB ports
- 16:9 aspect ratio

## QuikStart Standby Mode

- QuikStart standby mode enhances system portability by reducing startup and shutdown times.
  - Fast system boot up: from off, approximately 90 seconds
  - Transport mode: from sleep mode to on, approximately 5 seconds
  - Transport mode lasts 30 minutes

## Audio Speakers

- High-performance audio speakers integrated with control panel

## Physiological Interface

- Standard 3-lead ECG interface
- Auxiliary input/output for ECG and other physiology signals from third party devices
- Continuous display in all real-time modes
- Auto gain for physio signal
- R-Wave single and dual trigger function
- Respiratory trace
- Heart rate display
- Adjustable gain and trace position on-screen
- Recovery time: less than 2 seconds

## Operating System

- Supported with operating system Windows 7

## Hard Drive

- Internal 500 GB Solid State Drive (SSD)
- Allows storage of patient studies that include images, clips, reports and measurements
- Image storage capacity up to 300,000 images with compression

## HIPAA Compliance

- The ACUSON Juniper ultrasound system provides the necessary tools to address the saving, accessibility and sharing of protocols according to HIPAA privacy safeguards

## Transducer Technology

The ACUSON Juniper system imaging transducers use Twin Cam – Zero Insertion Force connectors. This technology provides preserved signal integrity and improvement in signal to noise ratio.

The ACUSON Juniper system supports a single crystal phased array transducer for instantaneous imaging. Ultra-sensitive, wideband transducers, matched with user-selectable MultiHertz multiple frequency imaging, improve resolution and penetration. Up to seven 2D and THI frequencies and up to three color Doppler and spectral Doppler frequencies expand the clinical versatility of a single transducer, thereby maximizing transducer investment.

- The following transducers are supported on the system: 5C1, 7C2, 16L4, 12L3, 11L4, 18H5, 5P1, 8V4, 10V4, 11M3, 8VC3, 9VE3, 10MC3, 9MC3, CW2/CW5
- 5P1 transducer single crystal array transducer technology for precise beam elevation control and exceptional spatial resolution throughout the field of view
- 5C1, 7C2 and 12L3 transducers utilize Hanafy lens transducer technology to provide excellent elevation focusing and uniform beam intensity throughout the field of view
- 8VC3 and 9VE3 transducers with *fourSight* 4D transducer technology provide superior image quality, contrast and detail resolution in 2D, 3D and 4D imaging modes
- microCase transducer miniaturization technology and SuppleFlex transducer cables SuppleFlex cables and integrated cable management provide protection during exams and transport

- Advanced hybrid and disposable biopsy guides for specified transducers
- Reusable and sterilizable stainless steel biopsy guides for 10MC3, 9MC3 and 9VE3
- Independent 2D and color frequencies for optimal resolution and penetration
- Frequency range: 1.1–18.0 MHz
- Twin Cam – Zero Insertion Force connector for improved signal to noise ratio

For more detailed transducer information please refer to the ACUSON Juniper transducer flyer.

## Transducer Ports

- Supports five active transducer ports
- Twin Cam – Zero Insertion Force connector
- Electronic transducer selection
- One-handed transducer connection and disconnection
- Ergonomic access to all transducer ports
- Aux CW port for 2 MHz and 5 MHz CW transducers
- Multiple cable hooks available throughout

## Transducer Storage and Gel Warmer

- 7 transducer cup holders support all transducer designs and gel bottle storage
- Ergonomic cable management for in-exam convenience and secure transport
- Specialty transducer holders for endocavity, intra-operative, Aux CW, and 4D transducers
- Integrated gel warmer (standard) and large gel holder for Germany (optional)
- Utility rear storage basket and magnetic side storage bin

## Imaging Modes and Options

### Imaging Modes

- 2D
  - Fundamental 2D
  - Phase Inversion THI
  - Filtered THI
- Color Doppler
  - Velocity-based color Doppler
  - Power Doppler
  - Directional power Doppler
  - Color Doppler tissue imaging

- Spectral Doppler
  - Pulsed wave
  - Steerable Continuous Wave (SCW)
  - Auxiliary continuous wave on pencil probe
  - Spectral Doppler tissue imaging
  - Duplex and Triplex modes
- M-mode
  - M-mode
  - Color M-mode
  - Anatomical M-mode

## Display Modes

Selectable split screen display formats in 2D or 2D/color with M-mode and/or spectral Doppler mode: top-bottom or side-by-side in real-time and digital cine replay.

- 4B-mode allowing simultaneous display of 4 static B-mode images
- Virtual Format
- Dual from freeze
- Split/Zoom
- Adjustable 2D or 2D/color 5 level image size

Flexible combination of imaging modes in side-by-side Dual and Dual Select in real-time and digital cine replay.

### 2D mode Image Processing

- Fundamental frequency, transducer dependent: up to 4
- Harmonic frequency, transducer dependent: up to 5
- Adjustable size and position of field of view
- Adjustable image size
- Gain in one decibel increments: -30 dB to 30 dB  
Dynamic range in three decibel increments: 10 dB to 90 dB in 3 increments
- Focal zones: up to 8
- Magnification: up to 10
- Acquired 2D mode frame rates, depending on the transducer and imaging depth: up to 1427 fps (frames per second)
- Cine capture: up to 60 seconds
- Resolution/speed: 6 levels
- Persistence: 5 levels
- Edge enhancement: 4 levels
- Dynamic TCE (DTCE) technology for speckle reduction: 3 levels  
Gray maps: 7 and Color maps: 16

- SieClear and Advanced SieClear spatial compounding to reduce speckle and enhance contrast resolution
- Tissue Harmonic Imaging (THI) technology to enhance visualization and reduce noise
- eSieImage technology to optimize image brightness uniformity in the field of view by changing the DGC and overall gain
- Clarify Vascular Enhancement (Clarify VE) technology to increase the contrast resolution and enhance the boundary detection: 7 levels
- Custom Tissue Imaging (CTI) to optimize the 2D image by adjusting the speed of sound

### MultiHertz Multiple Frequency Imaging

Siemens Healthineers unique MultiHertz multiple frequency imaging is designed to combine the resolution and penetration of several transducers into one. At the push of a button, the user can independently change frequencies for 2D, THI, color and spectral Doppler to select the optimal combination for image resolution, penetration and sensitivity.

- Transmit frequencies: up to 9 user-selectable frequencies
  - 2D and M-mode: up to 4 fundamental frequencies
  - THI: up to 5 frequencies
  - Color, power, or pulsed wave Doppler modes: up to 3 frequencies
  - M-mode: up to 5 frequencies
  - SCW Doppler mode: 2 frequency
  - Auxiliary CW Doppler mode: 1 frequency

### Tissue Harmonic Imaging (THI)

Selectable harmonic frequencies increase success with difficult-to-image patients, improving diagnostic confidence, and dramatically improving contrast and spatial resolution by reducing noise and clutter in the image.

- Available on the 7C2, 5C1, 11M3, 8VC3, 11L4, 12L3, 16L4, 18H5, 5P1, 8V4, 10V4, 9MC3, 10MC3, 9VE3
- MultiHertz imaging capability in THI

### Focusing

- Transmit focal zones: up to 8 zones
- Digital dynamic receive focusing with dynamic apodization
- Multi-position, user-selectable position
- Can use multiple focal zones simultaneously

## 2D Image Display

- Full screen, Split, Quad and Dual Select screen formats as well as Dual, Dual seamless, Dual select and Dual from Freeze
- Curved Vector format
- L/R flip and U/D flip for all formats in real-time and digital cine replay
- Split/Zoom
- Image depth: 1–30 cm in 0.5 cm increments (transducer dependent)
- Virtual Format Imaging (transducer dependent)
  - Left/right steer
  - Trapezoid Imaging
- Digital read/write Zoom with image pan
  - Available on live and cine replay images
  - up to 10× zoom (transducer dependent)
- 4B-mode
- Adjustable display size: 5 level

## 2D Calipers – Generic Measurements and Calculations

- Multiple cursor sets on frozen, live, dual screen and cine playback images
- Distance measurement
  - Depth measurement from skin line
  - Angle measurement
  - Area and circumference: ellipse, trace
- Compound Measurements
  - Volume: user-selectable preset by 1 distance, 2 distance, 3 distance, or 1 ellipse and 1 distance
  - Flow volume: 1 velocity and 1 distance, or 1 velocity, 1 ellipse, eSie Calcs and Auto Stenosis
  - Stenosis: user-selectable preset calculated by 2 ellipse, or 2 distance measurements and one additional tool for stenosis tool is Ellipse Trace

## Color Doppler Velocity Imaging

- Available on all imaging array transducers
- Multi-beam formation technology provides quad signal processing for color Doppler frame rates up to 72 fps (transducer dependent)
- Transmit frequencies: Up to 3 user-selectable frequencies per transducer
- Left/right steer on all linear transducers
- Color Doppler invert
- Advanced processing in color Doppler mode resulting in excellent spatial resolution and superior Flash suppression

- Auto Color flow state optimization with high, medium and low flow settings
- Color Doppler velocity maps: up to 10 user selectable maps (9 velocity and 1 velocity/variance)
- Velocity scale range:  $\pm 0.6 - \pm 245.5$  cm/sec (transducer dependent)
- PRF scale range: 100–25500 Hz (transducer dependent)
- Gain: -20–20 dB in 1 dB increments
- Color Doppler line density: 6 selections
- Wall filter: 4 selections
- Color smoothing: 4 levels
- Tissue/color priority: 5 selections
- Color Doppler persistence: 5 levels
- Baseline Shift: 13 levels
- Velocity tag
- DTI Doppler Tissue Imaging capability available on the 5P1, 8V4, 10V4, 11M3 transducers

## Power Doppler Imaging/Directional Power Doppler

- Available on all imaging array transducers
- Multi-beam formation technology provides quad signal processing for power Doppler frame rates up to 66 fps (transducer dependent)
- Left/right steer on all linear array transducers
- Transmit frequencies: Up to 3 user-selectable frequencies per transducer
- Power Doppler maps: Up to 16 maps (8 directional and 8 non-directional)
- PRF scale range: 100–25500 Hz (transducer dependent)
- Gain: -20–20 dB in 1 dB increments
- Power Doppler line density: 6 selections
- Wall filter: 4 selections
- Power Doppler smoothing: 4 levels
- Tissue/power Doppler priority: 5 selections
- Color persistence: 5 levels
- DTE Doppler Tissue Energy capability available on the 5P1, 8V4, 10V4, 11M3 transducers

## Color and Power Doppler Display

- 2D/C mode, Split 2D-2D/C mode
- Dual real-time 2D/C mode
- 2D/C/D mode (simultaneous, triplex), 2D/C/D mode

### Pulsed Wave Spectral Doppler

- Available on all imaging array transducers
- Transmit frequencies: up to 3 user-selectable frequencies per transducer
- DTI capability available on select transducers
- Sweep speed: 10 selections
- Post-processing gray maps: 7 maps
- Doppler colorization maps: 12 user-selectable maps
- Gain: -30~30 dB in 1 dB increments
- PRF range: 152–39100 Hz (transducer dependent)
- Velocity scale range:  $\pm 1.0 - \pm 840$  cm/sec with  $0^\circ$  angle correction (transducer dependent)
- Angle correction:  $0-89^\circ$  in  $1^\circ$  increments
- Gate size: 0.5–20 mm
- Wall filter: 14–6055 Hz, 7 steps (transducer dependent)
- Baseline shift: 13 levels
- Spectral invert
- Autotrace function
- Doppler equalization function

### Steerable Continuous Wave (SCW) Doppler

- Available on all phased array transducers
- Transmit frequency up to 2 frequency
- Sweep speed: 10 selections
- Post-processing gray maps: 7 maps
- Doppler colorization: 12 maps
- Gain: -30~30 dB in 1 dB increments
- PRF range: 152~52100 Hz sample rate (transducer dependent)
- Velocity scale range:  $\pm 1.5 - \pm 1100$  cm/sec with  $0^\circ$  angle correction (transducer dependent)
- Wall filter: 14–6950 Hz, 7 steps (transducer dependent)
- Baseline shift: 13 levels
- Spectral invert
- Auto trace function is supported in SCW mode
- Doppler equalization function

### Spectral Doppler Display

- Full screen Doppler trace, 2D/Doppler mode, triplex or update 2D/C/Doppler
- Imaging display: 4 formats
  - Top-bottom:  $1/3-2/3$ ,  $1/2-1/2$ ,  $2/3-1/3$
  - Side-by-side: 50–50

### Spectral Doppler Calipers – Generic Measurements and Calculations

- Multiple cursor sets on frozen and cine playback images
- Velocity/Frequency/Pressure Gradient
- Heart rate/Heart cycle/Time
- Auto trace measurements in real time and freeze including calculations for PS, ED, TAMx, PI, RI and S/D
- Resistive Index (RI)
- Pulsatility Index (PI), including Peak-to-Peak method
- Time Average Velocity max (TAV)
- Systolic/diastolic ratio (S/D)
- Velocity Time Integral (VTI)
- Acceleration/Deceleration
- Flow volume using combined velocity and distance, or velocity and ellipse measurements
- Doppler angle correction after measurement

### M-mode

- Available on all imaging array transducers
- Anatomical M-mode – live and cineloop
- Frequencies: Up to 4 user-selectable frequencies, including fundamental and harmonics
- Edge enhancement: 4 selections
- Display dynamic range: 10–90 dB in 3 dB increments
- Gain: -30–30 dB in 1 dB increments
- Gray maps: 7 maps
- M-mode colorization maps: 16 maps
- Sweep speed: 10 selections

### M-mode Image Display

- Full screen M-mode, 2D/M-mode
- Imaging display: 4 formats
  - Top-bottom:  $1/3-2/3$ ,  $1/2-1/2$ ,  $2/3-1/3$
  - Side-by-side: 50–50

### M-mode Calipers – Generic Measurements and Calculations

- Multiple cursor sets on frozen and cine playback images
  - Distance
  - Time
  - Slope
  - Heart rate

### User-defined Exams

- All imaging modes and parameters are customizable and programmable using QuickSet user-programmable system parameters
- Up to 2 pages on touch screen exam
- QuickSet parameters combine all preferred imaging mode parameters, annotation, text and measurements into a single user preset

## Freeze, Cine and Cine Post-Processing Functions

### Cine Review

The cine feature is standard and offers the ability to review real-time acquired data. All real-time, post-acquisition optimization functions are available in cine review.

- Frame-by-frame cineloop review and continuous cine motion review, including control of playback rate
- Independent cine review in mixed modes (2D/M, 2D/Doppler, 2D/C/Doppler)
- Independent cine review in 2D Dual Select mode with image align playback feature
- Standard cine memory: up to 1260 frames
- Acoustic clip capture from cine review
- Anatomical M-mode

### Post-Processing Features in Freeze Frame or Cine

- 2D mode
  - Zoom/pan
  - Gray map
  - Colorization map
  - Measurements/reports/annotations/pictograms
- Color Doppler
  - Zoom/pan
  - Color map
  - Color invert
  - Measurements/reports/annotations/pictograms
- Spectral Doppler
  - Gain
  - Gray map
  - Doppler colorization map
  - Angle correct
  - Measurements/reports/annotations/pictograms
- M-mode
  - Gray map
  - M-mode colorization map
  - Measurements/reports/annotations/pictograms

### DTI Velocity (DTV) Capability

Provides real-time imaging display of tissue mean velocities in the sampling area within the user-selected region of interest using various user-selectable color coding maps.

- Available in Cardiology imaging
- Level: Independent signal gain adjustment
- Tissue/Color priority: Up to 5 selections
- Wall filter: Up to 4 selections
- Resolution/Speed: 6 levels to achieve desired spatial and temporal resolution
- Persistence: 5 levels, for color frame temporal averaging, allowing smoothing of tissue motion information over time
- Smooth: 4 levels, for smoothing tissue motion information in two spatial dimensions
- Maps: 5 velocity maps to optimize a real-time or frozen DTV image

### DTI Energy (DTE) Capability

Provides real-time imaging display of the intensity of Doppler signals returning from tissue within the user-selected region of interest using various user-selectable color-coding maps.

- Available on all probes which support cardiac application
- Level: independent signal gain adjustment
- Tissue/Color priority: Up to 5 levels
- Wall filter: Up to 4 selections
- Resolution/Speed: 6 levels to achieve desired spatial and temporal resolution
- Persistence: 5 levels, for color frame temporal averaging, allowing smoothing of tissue motion information over time
- Smooth: 4 levels, for smoothing tissue motion information in two spatial dimensions
- Maps: 6 energy maps to optimize a real-time or frozen image

## Study Types

The ACUSON Juniper system is designed to support many multi-specialty imaging applications. Factory-supplied exam and transducer dependent imaging presets have been carefully optimized for each application to provide consistency, reliability and increased productivity. All applications include body markers, text and annotation labels. Selected applications support customized reports. The following study types are supported:

- Abdominal
- Renal
- Bowel
- FAST
- Lung
- Obstetrics
- Gynecology
- Pelvic floor Imaging
- Small Parts (Breast, Testis, Penile, Thyroid) and superficial
- Musculoskeletal (Spine, MSK, Digital, Nerve)
- Echocardiography (Adult, Pediatric, Fetal and Neonatal)
- Pediatric Imaging (Abdomen and Hip Joint)
- Neonatal Imaging
- Vascular (Carotid, Peripheral Artery & Vein, TCD)
- Stress Echo
- Urology (Pelvis, Prostate)
- Intra-Operative

## Exam-specific Measurements and Reports

- All measurement and report packages are available for use with all exam types
- All exam-specific measurement and reports support:
  - All general measurements and calculations
  - Comprehensive, customizable, patient reports and worksheets
  - Customizable anatomy descriptions
  - Physician summary utility – supports on-system report generation including customizable letterhead, patient data, results, graphs, images, comments, recommendations and a customizable signature line

The following Measurements and Reports packages are available on the ACUSON Juniper ultrasound system:

### Abdomen

- All general measurements and calculations

### Obstetrics

- Early Obstetrics Gestational Age (GA) measurements are MSD, CRL, and Yolk Sac
- Gestational Age parameter labels are MeanSac Diameter (MSD), CRL, BPD, OFD, HC, AC, TAD, APAD, FL, HL, Ulna (UL), Tibia (TL), Foot (FT), FTA and Binocd (BN)
- Unlimited user-defined measurement labels
- Calculations include: EFW from the selected reference, HC/AC, TCD/AC, LVW/HW, BPDa, FL/AC, FL/BPD, CI,AFI, A XT
- Comprehensive Fetal Heart measurements and calculations Facial Angle
  - Nuchal Translucency and Nuchal Fold measurements
- Calculations for both Gestational Age (GA) and Estimated Date of Confinement (EDC)
- Early OB and Standard OB patient reports include worksheets for viewing the progress of the report and editing during the exam process
- Multiple fetus reporting capabilities
  - Maximum of 4
- Growth Analysis Graphs with exam file linking
- Detailed Fetal Heart report page

### Gynecology

- Micturated and residual volume calculation
- Uterus, Right and Left Ovary, Right and Left Follicle, CRL, MSD, GS and Yolk Sac measurements
- Follicle measurement supports up to 15 follicles
- Follicle measurement methods supported
  - MDistance
  - 2Dist + Avg
  - 3Dist + Avg
  - 2Dist Avg
  - 3Dist Avg
  - Area
  - Volume
  - Circumference

## 2.1. Suaugusiųjų ir vaikų kardiologinių matavimų paketas

### Echocardiography

#### • Adult and Pediatric echocardiography measurements are standard

- Volume formulas for Left Ventricle, Left Atrium, Right Ventricle and Right atrium function assessment in 2D mode
- 2D mode, M-mode and Doppler calculations
- M-mode Slope, Heart Rate, Time and Distance measurements
- Spectral Doppler Velocity, Pressure Gradient, Pressure Half Time, VTI, Acceleration, Deceleration, HR, PISA, Qp/Qs and Time
- Cardiac patient report and worksheet for 2D mode, M-mode and spectral Doppler
- Valvular assessment in 2D, M-mode and Spectral doppler such as MV, TV, AV and PV

### Carotid

- All proximal, Mid and distal measurement for CCA, ICA, ECA, VA in 2D mode and Spectral Doppler mode with right and left side
- All proximal, Mid and distal measurement for Subclavian artery in 2D mode with right and left side
- Left and right bulb measurement in 2D mode
- ICA/CCA ratio in Spectral Doppler

### Arterial

- All Proximal, Mid and Distal measurement for Subclavian, Axillary, upper extremity Stent, Brachial, Deep Brachial Radial and ulnar arteries in 2D mode and Spectral Doppler mode with right and left side
- All Proximal, Mid and Distal measurement for Inflow and outflow vessels, Arteriovenous Fistula, Anastomosis and Graft in 2D mode and Spectral Doppler mode with right and left side

### Venous

- All Proximal, Mid and Distal measurement for Internal jugular, Subclavian, Axillary, Brachial, Cephalic, Basilic, Median Cubital, Radial and Ulnar venous in 2D mode and Spectral Doppler mode with right and left side

### Thyroid

- Volume formulas for Thyroid lobes and up to 15 separate Nodules in 2D mode Isthmus AP, Transverse of Thyroid, AP of Thyroid, Sagittal of Thyroid and Parathyroid in 2D mode
- All left and right side measurement for Superior, Inferior thyroid arteries and venous in Spectral Doppler

### Urology

- Volume formulas for prostate, bladder with pre-void and post-void in 2D mode

All left and right side measurement for Seminal vesicle, Vas Deferens and Ejaculatory duct in 2D mode. All left and right side measurement for Pudendal and internal Iliac arteries and venous in Spectral Doppler.

### Testicle

- Testicle Volume, Pampiniform plexus, Scrotal wall, Epididymal Testicular, Intratesticular
- Volume formulas for testicle, Epididymis and up to 5 masses in 2D mode
- All left and right measurement for Pampiniform Plexus and scrotal wall in 2D mode
- All left and right measurement for Epididymal, Intratesticular, testicular arteries and venous in Spectral Doppler

### Pediatric Hip

- Right and left hip angle measurement
- Classification and Graf Sonometer
- Hip angle patient report
- Flexed FHC and Stressed FHC with left and right side measurement in 2D mode

### TCD

- All Proximal, Mid and Distal measurement for MCA, Ophthalmic A and Basilar A in 2D mode and Spectral Doppler with left and right side
- All left and right side measurement for ICA-Siphon, ACA-Ao, ACA-A2, ACoA, PCA-P1, PCoA and ACA in 2D mode and Spectral Doppler

## Emergency Medicine

- FAST – Focused Assessment with Sonography for Trauma reporting
- Lung – Essential lung measurements and reporting to support emergency medicine
- OB – Subset of essential OB measurements and reporting

The ACUSON Juniper system supports customizable labeled measurements (B-mode, Doppler and M-mode) for the following exam types: Abdomen, Echocardiography, Musculoskeletal, Breast, OB, Testicle, Venous, Renal, Superficial Musculoskeletal, and Small Parts. All reporting packages support user-defined descriptors.

## Penile

- Corpus Cavernosum, Corpus Spongiosum and Urethra in 2D mode
- All left and right side measurement for Cav A, Pre-Inj Cav A, Post-Inj Cav A, Iliac A, Dorsal A, Pre-Injection Dorsal A, Post-Injection Dorsal A, Urethral A, Bulbar A, Brach A, Sup Dorsal V, Dp Penile V in 2D mode
- All left and right side measurement for Cav A, Pre-Inj Cav A, Post-Inj Cav A, Iliac A, Dorsal A, Pre-Injection Dorsal A, Post-Injection Dorsal A, Urethral A, Bulbar A, Brach A, Sup Dorsal V, Dp Penile V in Spectral mode

## Digital Patient Study Storage and Archiving

The DIMAQ-IP integrated workstation allows for digital acquisition, storage and review of complete ultrasound studies, including static images, dynamic clips, measurements, calculations and reports.

Studies can be reviewed and quantified on-board, stored on the system Storage device and transferred to the built-in DVD multi-drive (DVD-R/RW & CD-R/RW) or USB flash drive for cost-effective archival. Patient Study Management Playback of digitally stored images in a selectable 1-up, 4-up, 9-up, 16-up or 25-up screen format. The patient study screen allows search, selection and deleting of studies or export to DVD multi-drive (DVD-R/RW and CD-R/RW).

- 300 GB of the 500 GB internal Storage device reserved for patient data management
  - Patient database sorting by Name, ID and Study Date
- Storage device capacity:
  - Approximately 300,000 B/W and color images
- Storage and retrieval of static images
- Storage and retrieval of cine clips
  - Retrospective clip capture during real-time imaging with a selectable duration of 1, 2, 4, or 8 seconds or a selectable duration of 1, 2, 3, 4 or 8 beat capture; ECG-triggerable
  - Prospective clip capture during real-time imaging with a selectable duration of 1 to 60 seconds or a selectable duration of 1 to 60 beat capture; ECG-triggerable
- Export of patient studies from Storage device
- Storage and retrieval of reports
- Supports measurements and calculations on archived study and on saved and retrieved images
- Acoustic clip capture from cine review
- M-mode still frame scroll and store
- PW spectral Doppler still frame scroll and store
- Export of patient studies from Storage device to DVD-R/RW and CD-R/RW drive. Studies can be individually selected or batched copied
- The system supports the following data export file formats PDF, TIFF, AVI, JPG and DICOM. Connectivity to PACS, other off-line storage (such as USB flash drive) or EMR device is achieved via LAN or WLAN connection
- Compatible with removable 650 MB, 700 MB and 790 MB CD-R and 650 MB or 700 MB CD-RW
- Removable 4.7 GB single layer DVD and 8.5 GB single side double layer DVD
- Supports export to USB flash drive

## Applications

### Enhanced Needle Visualization (Option)

Enhanced needle visualization allows for advanced image formation to improve the display of the needle. Utilizes unique Pixel former architecture for multiple needle interrogation angles. Proprietary blending algorithm and speckle filters deliver optimal needle visualization while maintaining image quality.

- Multiple angle needle enhancement for in-plane imaging: angle needle up to 35°
- Needle visualization enhancement setting can be stored with user-defined Exam Type for each customization
- Available on all linear transducers

### eSieScan Workflow Protocols (Option)

eSieScan workflow protocols allow the operator to focus on patient care, rather than system interaction. eSieScan protocols anticipate and execute your exam based on customizable programs. eSieScan protocols dramatically decrease keystrokes, enabling shorter exam times, better throughput and reduced intraoperator variability. eSieScan protocols are available for Cardiac, Vascular, OB, Breast exams.

### syngo Arterial Health Package (AHP) (Option)

syngo Arterial Health Package provides the clinician with the capability to measure Carotid Intima-Media Thickness (CIMT) and the option to reference normative tables that have been validated and published in peer-reviewed studies.<sup>1</sup> The information is intended to provide a straightforward tool for communicating with patients the relative state of their cardiovascular system.

### eSie Touch Elasticity Imaging (Option)

eSie Touch elasticity imaging is a quantitative imaging method that calculates and displays the relative stiffness of the tissue.

eSie Touch elasticity imaging allows the user to generate the elastogram by applying gentle sequential compression cycles during standard B-mode imaging. This relative displacement of tissue is displayed as an elastogram in a live dual image display of the grayscale or color image with the standard B-mode image.

- Unique mapping options in grayscale and color further enhance the ease of interpreting an elastogram

- Area, Distance and Strain ratio measurement capability allow for quantitative comparison of two images
- A quality factor indication provides feedback on the quality of acquisition and allows more acute selection of most appropriate frame(s) for assessment or measurement

## Liver Tissue Analysis

The Liver Tissue Analysis (Virtual Touch Quantification) Acoustic Radiation Force Impulse (ARFI) technology-based applications provide quantitative stiffness analysis capabilities.

### Virtual Touch Quantification (Option)

Virtual Touch quantification is a real-time measurement technique that utilizes ARFI imaging to gently displace tissue for quantitative evaluation of tissue stiffness properties.

- Available only with the 5C1 transducer
- The system automatically generates the tissue displacement without manual tissue compression, so that tissue stiffness properties can be quickly and easily measured within a small region of interest
- Measurements can be more reliably correlated to anatomic location through simultaneous display of the movable measurement cursor in the dual image
- Liver assessment report package which includes IQR/mean
- Labeled measurement capabilities including IQR/median

## OB/Gyn Package

### syngo Auto OB Measurements (Option)

Siemens Healthineers innovative syngo Auto OB measurements algorithm provides automated biometry measurements.

- Measures BPD, OFD, HC, AC, HL and FL
- Utilizes trained, pattern recognition algorithms
- Once accepted, measurements are automatically saved to the report
- Set-up option for outer-to-outer caliper placement

### syngo Auto Follicle Measurements (Option)

The syngo Auto Follicle measurement option is an automated measurement technique that enables fast and accurate assessment of multiple follicles. It helps reduce exam time by allowing the user to automatically capture and record measurements.

### 3-Scape Real-Time 3D Imaging

- 3-Scape imaging provides a freehand acquisition technique
- Supported on 5C1, 7C2, 9MC3, 10MC3, 8VC3 and 9VE3 transducers

### fourSight 4D Imaging (Option)

- fourSight 4D transducer technology
  - Provides real-time 3D images
  - Utilizes mechanical acquisition
  - Up to 19.3 vol/sec
  - 8VC3 and 9VE3 4D transducers supported
  - Offers an easy-to-use interface for rapid acquisition and volume rendering Curved Top VOI 4D cine
  - MPR Measurements
- Advanced fourSight Technology
  - Offers enhanced 3D/4D acquisition, data rendering and post-processing functionality
  - MultiSlice format allows the user to select range, slice spacing and format for viewing each slice. MultiSlice format supports up to 36 slices at once
  - Thick Slice Imaging (TSI) enables definition of a view plane and creates a thick slice around the region of interest. TSI delivers improved contrast resolution and provides more information in a single image
  - Curved MPR enables real-time multiplanar reformatting of images into any linear or curved plane

This permits the user to set points along a curved object in order to bring all objects along this line into the same plane for viewing, such as the fetal spine.

## 2.1. PHYSIO modulis ir EKG laidai - elektrokardiografinis tyrimo papildymas

## Cardiac Imaging and Quantification Package

The Cardiac Imaging, Protocols and Quantification package provides the functionality necessary for performing standard adult, pediatric and neonatal cardiac exams.

### Cardiovascular

Contains the prerequisites to perform cardiac and certain vascular exams:

- Physiological interface
  - Standard 3-lead ECG interface
  - Aux ECG interface
  - R-Wave single and dual trigger function
  - Heart rate display
  - Adjustable gain and trace position on screen
  - Selection for external ECG input
  - Respiratory function
- Steerable Continuous Wave Doppler module
- Auxiliary Continuous Wave Doppler module

### DTI Doppler Tissue Imaging (for Cardiac)

DTI capability uses Siemens Healthineers proprietary multivariate motion discrimination technology for processing Doppler frequency shift information from moving tissue (e.g., myocardium, heart valves, etc.) and displays physiologic data on velocity, acceleration and scattering capabilities of moving tissues in several imaging and strip display capabilities. It provides additional clinical and investigational information on myocardial function during transthoracic studies.

- DTI Doppler tissue imaging option includes the following:
  - DTI Velocity (DTV) capability
  - DTI Energy (DTE) capability

### Physio Module (Option)

- Provides the ability to configure ECG capabilities for specialty applications that do not require Continuous Wave Doppler capabilities
- AUX ECG and Respiratory functions are supported in addition to conventional Physio Module

<sup>1</sup> This feature should be utilized according to the ASE Consensus Statement, "Use of Carotid Ultrasound to Identify Subclinical Vascular Disease and Evaluate Cardiovascular Disease Risk: A Consensus Statement from the American Association of Echocardiography; Carotid Intima-Media Thickness Task Force, Endorsed by the Society for Vascular Medicine."

### Stress Echo (Option)

- The stress echo package provides tools for ECG-triggered acquisition, display, selection comparison, evaluation and archiving of multiple cardiac loops during various stages of a stress echo examination
- Standard acquisition protocols for treadmill, bicycle and pharmacological stress including:
  - Multiple factory default stress echo protocols
  - Customizable stress echo protocols
  - Ability for customized studies through Protocol Configuration, with up to up to 20 stages, 30 views per 1 stage
  - Full screen or ROI (region of interest) acquisition
- Complete R-R capture with clip editing
- Easy workflow throughout the exam protocol
- Stage Timer and additional Manual Timer
- Prospective continuous capture or Retrospective labeled capture
- Reference image display during acquisition
- Immediate review of acquired loops
- Flexibility to skip views or stages
- Flexibility to re-acquire and overwrite already acquired images
- Indication of current view, acquired views and skipped views in the workflow diagram
- Wall Motion Scoring, 16/17 segment model with graphical display and report printing
- LV Volume Measurements with report printing

### eSie Measure Workflow Acceleration Package (Option)

The eSie Measure workflow acceleration package is the first innovative application that provides semi-automated measurements for routine echo exams, improving efficiency and consistency for end users. Based on a knowledge base of over a thousand expert-traced datasets, the eSie Measure package improves accuracy and reproducibility. Manual measurement accounts for a large portion of an echo exam time and requires repetitive key strokes which can lead to long term stress injury. With a push of a button, the eSie Measure package semi-automatically generates reliable measurement data for 2D, M-mode and spectral Doppler, increasing consistency, reproducibility and accuracy of each exam, while reducing key strokes.

## 2.2. eSieMeasure - automatiniai kardiologiniai matavimai, pagreitinantys tyrimo eigą ir standartizuojantys matavimų atlikimą

### eSie Left Heart Measurement Package (Option)

eSie Left Heart Measurement Package utilizes knowledge based technologies specifically designed to identify and measure contours on a typical transthoracic exam of left ventricle and atrium in an automated manner. The algorithms are trained on a large image database of apical 4CH and 2CH adult transthoracic 2D echo views annotated by clinical experts and provide a quick and easy measurement of EF, EDV and ESV for both LV and LA. The application is available both on and off the system and is trained on apical 4CH and 2CH transthoracic 2D echo views. eSie Left Heart enables improvement in efficiency and workflow in a routine clinical setting.

## Advanced Technologies and Features

### Dynamic Persistence

Dynamic Persistence is associated with B-mode and Color. It prevents ghosting when probe or patient motion is detected, and enhances color sensitivity and reduces B-mode noise when no motion is detected.

### Auto Flash Color Artifact Suppression

Siemens Healthineers proprietary and ground-breaking technology detects and prevents motion artifacts associated with probe and patient movement, and enhances color imaging sensitivity when no motion detected.

### Dynamic TCE Technology

- Dynamic TCE technology is a proprietary, advanced post-processing method for speckle reduction
- Compatible with other advanced imaging modes including Advanced SieClear compounding, THI and eSieImage technology
- Supports all primary and secondary exam types
- Three levels available: Low, Medium and High
- Available on all imaging transducers
- Universal Image Processing

### Advanced SieClear Spatial Compounding

This feature combines two distinct technologies to create exceptional image quality: Advanced SieClear spatial compounding and SieClear compounding. This combination of technologies provides exceptional improvements in border definition.

- Up to 7 steering angles available on linear transducer, 7 available on curved array transducers
- Supports all primary and secondary exam types

### Advanced SieClear Spatial Compounding in Color and Power Doppler

This feature enables Advanced SieClear spatial compounding when either color or Power Doppler is active, bringing the Advanced SieClear spatial compounding image quality advantages to Doppler imaging.

### SieClear Multi-view Spatial Compounding

- Available on all linear transducers
- Supports all primary and secondary exam types
- SieClear compounding is compatible with all standard imaging modes such as 2D, Dynamic TCE, CDV, CDE, PW Doppler and M-mode, THI, SieScape imaging, eSiImage technology and Clarify VE technology

### Clarify Vascular Enhancement (VE) Technology

Clarify VE technology is a patented, real-time, adaptive technology that uniquely uses power Doppler flow information to reduce noise within macro- and microvascular structures, provide clearer vessel wall definition with improved tissue boundary detection, and enhance tissue contrast resolution without compromising spatial resolution.

- Factory presets optimized for each exam type
- 7 user-selectable levels
- Compatible with other advanced imaging options including THI, Dynamic TCE technology, SieClear, Advanced SieClear
- SieScape imaging, 3-Scape imaging and TEQ technology
- Available on all imaging transducers

### SieScape Panoramic Imaging (Option)

Large field of view images are acquired with real-time high-resolution grayscale imaging. These images present ultrasound information in anatomical context providing gross anatomical orientation for referring physicians, teaching and surgical consultation.

- Available on all linear and curved imaging transducers
- Displays up to 240 cm in length or 180°
- Pause and reverse during acquisition
- On-screen reference and speed indicators simplify scanning technique
- Zoom and Pan capabilities
- Unique cine display provides review capability of individual data frames composing the SieScape image
- 2D standard measurements and reports are available

### eSiImage Multiparametric Optimization

eSiImage multiparametric optimization enhances workflow by delivering a uniform image, removing unnecessary keystrokes and potentially reducing examination time. eSiImage innovatively optimizes key imaging parameters real time across different body structures.

- Adaptively maintains B-mode and Doppler image uniformity for varying tissue attenuation characteristics
- Optimizes both front end and back end gain independently therefore eliminating artifacts and image saturation
- Smoothly adjusts gain frame by frame to avoid large jumps and flashes in image quality
- Continuously identifies and suppresses noise and enhances tissue to compensate gain according to patients' unique anatomy and operator preference
- Enabled with TEQ technology
- Extends flexible gain compensation to the cine mode after image acquisition allowing adjustments in post processing for gain and TEQ technology
- Available on all imaging transducers

### **syngo eSie Calcs Native Tracing Software**

syngo eSie Calcs native tracing software performs automated trace measurements with area, maximum diameter and volume results. syngo eSie Calcs software segments any given lesion in 2D.

- Utilizes proprietary border detection technology for automatic segmenting of lesions and anatomical structures
- User accepts automated measurements, such as area, maximum diameter, etc.

### **DICOM 3.0 Connectivity**

Enables digital data transfer via a DICOM network for both printing and storage. The ACUSON Juniper system acts as a DICOM Storage Class User and DICOM Print Class User.

- Connectivity to PACS system for storage of all digital images and dynamic clips with patient demographic data
- In-progress store during the exam
- Image printing to DICOM color and grayscale printers
- DICOM storage commitment
- DICOM exchange media export to DVD-R/RW and CD-R/RW
- DICOM region calibration
- DICOM interchange media viewer software SHOWCASE
- Interchange media database that identifies the CD to which the patient study has been burned

### **DICOM Modality Worklist**

Enables query and direct download of the patient worklist schedule from the Hospital/Radiology Information System (HIS/RIS) to the ACUSON Juniper system, automatically populating the “New Patient” screen with patient demographic information.

### **DICOM MPPS – Modality Performed Procedure Step**

Enables automatic exchange of Modality Performed Procedure Step information with the Hospital/Radiology Information System (HIS/RIS).

### **DICOM Structured Reporting**

DICOM Structured Reporting (SR) provides standardized report architecture to allow for easy transfer of measurements to offline PCs, workstations and archiving systems. DICOM Structured Reporting will automatically populate measurements to their respective fields in an external software package. (To send the SR data over the network, the DICOM 3.0 connectivity option is required.) This option is available for the following applications:

- Vascular
- OB/GYN
- Cardiac

### **Integrated Gel Warmer**

- Temperature control precision:  $\pm 1^\circ$ 
  - Low: 31 °C
  - Medium: 34 °C
  - High: 37 °C
- Easy-to-use power on/off control switch
- LED color for status indicator
  - Standby mode: Off
  - Operating mode: Orange
- Safety protection for electrical overload
- Weight: ~ 370 g
- Size: 83 mm × 165 mm × 100 mm

### **Larger Gel Holder (Option)**

- 1 liter gel bottle holder

### **QuikStart (Option)**

QuikStart reduces time required for power-up and power-down events by allowing the system to enter a specialized standby mode.

- Standby mode power-down in 5 sec; complete boot-up in less than 5 sec
- Standby time: > 35 min
- Full recharge: < 180 min

**Barcode Reader (Option)**

- Allows fast and accurate patient information data input
- Easy attachment to USB port
- Supports 2D and 1D patient barcodes
- Can scan up to 3 individual barcodes: patient, physician and sonographer
- Inputs the following patient-identifying data:
  - Patient Name (First and Last)
  - Patient ID
  - Physician ID
  - Sonographer

**Dual USB Foot Switch (Option)**

- Programmable dual USB connected Foot Switch

**Wireless Data Transfer**

Utilizes internal Wi-Fi module to enable wireless connectivity between the ultrasound system and the facility's LAN to provide functionality equivalent to a wired network.

The Wireless Option supports connectivity with:

- DICOM services – Modality worklist, storage commitment and store
- Smart Remote Services – Remote update handling for storage distribution and TeamViewer for remote application support and remote trouble-shooting

Technical Specifications:

- Standards: IEEE 802.11n, 802.11g, 802.11b, 802.11a
- Security features: WEP, WPA, WPA2 personal, WPA and WPA2 Enterprise

**Protective Control Panel Cover (Option)**

- Customized Protective control panel cover for user interface and touch screen to support infection control
- Reusable

**Ultrasound System Security – Virus Protection**

Embedded virus protection solution that protects the system against advanced persistent threats, viruses, malware and other executing software by detecting and preventing any unwanted change to improve IT compliance and security.

**Documentation Devices****Optional On-Board Video Devices**

- Up to 2 documentation devices (B/W printer and color printer/DVR recorder) can be integrated into the system cart and controlled from the system control panel
- Supported devices:
  - Mitsubishi USB P95DW B/W Printer
  - Sony UP-D898 B/W Printer
  - Mitsubishi USB CP30DW Color Printer
  - Sony UP-D25MD Color Printer
  - TEAC DVD UR-50BD-SK Recorder (NTSC/PAL switchable, 115 V/230 V)

**Digital Storage and Imaging Archiving****Image Capture**

- DICOM or PC compatible file (AVI, JPG) formats for all images and clips
- Static image, dynamic clip, strip mode clip, 3D/4D dataset, and bookmark capture
- Selectable lossy (JPG) and lossless compression for static images or clips
- Acoustic clip storage live and from cine
- Anonymization during and after exams

**Storage Device**

- 500 GB Solid State Drive Image storage capacity greater than 100,000 images; color or black/white
- Automatic disk management (first in – first out) with capability to auto delete based on archived, archived and committed, archived and verified, sent, sent and committed, printed

### Read/Write DVD-R

- 25 GB; read Blu-ray, 50 GB or 100 GB Blu-ray (BD-R and BD-RE)
- 4.7 GB read/write DVD±R media
- 650 MB read/write CD-R media
- Storage capacity dependent upon writing session format and type and format of images, e.g., entire DVD written in one session with compressed color images stores approximately 2,000 images
- Allows storage of images, clips, volumes and transfer of presets across systems in DICOM or PC format (AVI and JPG)
- Supports system software and option upgrades
- Supports industry standard NTSC/PAL format, plus high-definition Blu-ray video/audio
- Performs real-time direct recording from the ultrasound system using Blu-ray (BD and BD-RE; Panasonic) or regular DVD (DVD-R, TDK) media
- Qualified for Panasonic and TDK and DVD media

### USB

- Two user-accessible USB 2.0 ports on left side of Touch Control screen
- Four user-accessible USB port on back of system
- Supports export of images and clips in DICOM, AVI and JPEG format, volumes, presets, and service log files

### Display Out

- Supports one HDMI out
- Supports one S-video out

### Exam Restart

Recall or restart an exam and allow for additional images to be appended to an already closed exam. A new series is created. There is a 24-hour time limitation on exam restart.

### Exam Review

Display of digitally stored images in user selectable screen formats (e.g., 1:1, 2:1, 4:1, 9:1, 16:1 etc.). Clip playback in 16:1 format. Exam review allows the selection of images for printing and deletion, review of the current exam in progress and archived exams retrieved from the patient browser on either the system storage device or optical drive, CD-DVD. Exam sorting/search can be done by name, ID, exam type and date/time. Compare function available for selected images.

## Smart Remote Services (SRS) Support

SRS connects your ultrasound system with Siemens Healthineers global team of technical and applications experts to provide faster response time and greater system availability. SRS is provided through a secure high-speed network.

The clinical reputation, operational excellence, and financial success of a healthcare provider rely on staff expertise and system performance. eSieLink Remote Assistance technology allows users to request real-time support sessions by granting system access to a Siemens Healthineers applications or technical expert. This allows an immediate remote assessment of clinical and/or technical questions.

The eSieLink Remote Assistance technology enables interactive services, including Remote Assist (RA), Remote Trainer (RT), and enhanced Smart Remote Services (SRS) to provide remote diagnostics and troubleshooting before onsite support is needed.

These remote assistance technologies allow users to take advantage of innovative system features and applications to improve exam workflow and patient throughput and to help maintain quality care standards. eSieLink Remote Assistance technology supports clinical staff with quick answers to questions and provides support by guiding them through menus and other system functions.

## System Dimensions

- System height: (upright FPD) 122.5–163.4 cm (upright FPD: Max. Arm + 11 cm up/down stroke)
- Width: 50.8 cm
- Depth: 65.4 cm; maximum depth: 84.5 cm
- Weight: 76 kg
- User-select control panel/monitor height adjustment
  - Control panel lowest position: 81 cm from handle
  - Control panel highest position: 92 cm from handle
  - Monitor lowest position: 141 cm measured to top of monitor with upright FPD
  - Monitor highest position: 174 cm measured from top of monitor with upright FPD

## Electrical/Environmental Specifications

- Voltage: 100–240 Vac (50/60 Hz)
- Power connections:
  - Universal input: 90–264 Vac
- Power consumption: Maximum 1.0 kVA (may vary with configuration)
- Atmospheric pressure range: 3000 m (700–1060 hPa)
- Ambient temperature range (without OEM's): +10 to +40 °C (50 to 104 °F)
- Humidity: 10–80%, non-condensing
- Maximum heat output: 2400 BTU/hr
- Fan noise: 28–33 dBA
- Input/Output: USB 2.0 x2 Port (USB-A), USB 3.0 x2 Port (USB-A), Ethernet (10 BaseT/100 BaseT/1000 BaseT)(RJ45), S-Video (4 Pin-Mini DIN), DVI (24 Pin DVI), HDMI (19 Pin HDMI)
- Video standard for DVI/HDMI
  - Resolution: 1920 × 1080 (fixed), Full HD

## Integrating the Healthcare Enterprise (IHE)

Having all relevant information at one's fingertips is a prerequisite for optimal and efficient patient care. Seamless integration of the hospital's IT and Imaging Systems and their capabilities to exchange information without restriction are key success factors for facilitating daily work. This is why Siemens Healthineers has been instrumental in launching and advancing the IHE (Integrating the Healthcare Enterprise) Initiative. Our commitment and dedication enable us to provide clinicians with the ACUSON Juniper one of many innovative products embedded with the building blocks necessary in supporting clinicians' need for seamless health information exchange.

For more information on the ACUSON Juniper and the Siemens Healthineers commitment to the IHE initiative, please visit [siemens.com/IHE](http://siemens.com/IHE).

## Standards Compliance

The ACUSON Juniper is in compliance with the following standards, including all applicable amendments at the time of product release.

### Quality Standards

- FDA QSR 21 CFR Part 820
- ISO 9001
- ISO 13485

### Design Standards

- ANSI/AAMI ES 60601-1
- CAN/CSA-C22.2 No. 60601-1
- EN 60601-1 and IEC 60601-1
- EN 60601-1-2 and IEC 60601-1-2 (Class B)
- Note: The system is a Class A device when the barcode reader, DVR are in use
- EN 60601-2-18 and IEC 60601-2-18
- EN 60601-2-37 and IEC 60601-2-37
- EN 60601-1-6 and IEC 60601-1-6
- ISO 14971
- EN 62304 and IEC 62304
- EN 62366 and IEC 62366

### Acoustic Output Standards

- IEC 62359 (Test Methods for the Determination of TI and MI)
- AIUM/NEMA UD-2, Acoustic Output Measurement Standard for Diagnostic Ultrasound
- AIUM/NEMA UD-3, Standard for Real-time Display of Thermal and Mechanical Acoustic output Indices on Diagnostic Ultrasound Equipment

The products/features mentioned in this document may not be commercially available in all countries. Due to regulatory reasons their future availability cannot be guaranteed. Please contact your local Siemens Healthineers organization for further details.

ACUSON Juniper, Advanced SieClear, Clarify, DTI, Dynamic TCE, eSieImage, eSie Left Heart, eSie Measure, eSieScan, eSie Touch, *fourSight*, microCase, MultiHertz, SieScape, SieClear, SuppleFlex, and Virtual Touch are trademarks of Siemens Medical Solutions USA, Inc.

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At Siemens Healthineers, our purpose is to enable healthcare providers to increase value by empowering them on their journey towards expanding precision medicine, transforming care delivery, and improving patient experience, all enabled by digitalizing healthcare.

An estimated 5 million patients globally everyday benefit from our innovative technologies and services in the areas of diagnostic and therapeutic imaging, laboratory diagnostics and molecular medicine, as well as digital health and enterprise services.

We are a leading medical technology company with over 170 years of experience and 18,000 patents globally. With more than 48,000 dedicated colleagues in 75 countries, we will continue to innovate and shape the future of healthcare.

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