VINNO

VINNO E35



Data sheet

V1.11

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VINNO E35

Ultrasound System Specifications

Mobile, solid and affordable VINNO E35 provides excellent value across the full range of general imaging and women healthcare applications. It is also perfect for regional nerve block, musculoskeletal, rheumatology applications by:

- Exceptional image quality including high end 3D/4D capability
- Versatile features and functions
- Amazing superficial imaging for breast and other small parts.
- Up to 22MHz capability provides excellent visualization tools in regional nerve block, musculoskeletal, rheumatology clinical applications
- Easy to use workflow with touch panel and 18.5'' monitor



1. System Overview

1.1 Architecture

- The revolutionary RF platform, The First In The World, allows for more accurate information. This platform transfers all RF data for computing without any information loss. It has a much better advantage in detail imaging than current advanced platforms
- Thanks to the RF platform, it allows the development of many RF-based processing algorithms, which have ultra-premium contrast and resolution imaging
- This unique platform is capable of processing multiple data streams simultaneously
- Up to 25MHz next generation digital broadband and high resolution acoustic beamforming
- The new 12 bit, low noise, digital circuitry, with up to 280db dynamic range has improved 2D performance and increased Doppler sensitivity
- Next generation adaptive image processing for noise and artifact reduction that improves tissue presentation and edge definition
- Fully independent, triplex multiple mode operation for easy in Doppler procedures

- Multi-processors allow simultaneous mode changes and support for advanced system functionality
- Zone Imaging technology can obtain high resolution and good penetration in the whole image zone through the adaptive dynamic beam control from the near field to the far field
- VLuminous Flow provides the color Doppler flow innovatively in a 3D view with excellent sensitivity, which can help understand the structure of blood flow and small vessels intuitively
- Sync ROI enables the width of 2D scan area is synchronized with the CF ROI, which effectively improves the frame rate
- Diverse customized tools make E35 a truly elite unit, which enhances efficiency dramatically
- Zscore analysis, provide a new way for fetal heart evaluation
- Support to export 3D data for 3D printer
- Support multiple DICOM server configuration
- Background transfer, supports background export without interrupting the actual scan
- VReport, a customer-centric tool for report templates design, makes the whole report procedure more smooth and individual
- Customized user interface, allows user to change the position of buttons on the touch screen, also the size of 'probe&app' UI window is adjustable
- VWork, an intelligent feature, which enables users to configure workflows for every application scenario. This leads to easy and effective adherence to a department protocol and saves operation time to a great extent

1.2 Applications

- Abdomen
- Obstetric
- Gynecology
- Cardiology
- Urology
- Vascular
- TCD
- Small Parts
- Pediatrics
- Intra-operative

1.3 Imaging features

- 2D grayscale imaging
- Harmonic imaging both in tissue harmonic and pulse inversion harmonic technologies
- VFusion, directional-enhanced information compounding
- VSpeckle, specialized and adaptive imaging processing to remove speckle noise artifacts and enhance tissue edge for clarity and accuracy

- VTissue, the advanced adaptive image processing to compensate for sound and speed variation in different tissue
- VFlow, adaptive color flow filter to increase the sensitivity of blood flow
- Auto imaging optimization
- Easy Comparative Function to compare previous exam
- M-mode
- Color Doppler imaging
- Power Doppler imaging
- Pulse wave Doppler imaging
- Simultaneous 2D and M mode
- Duplex 2D/PW Doppler
- Triplex 2D/Color/PW Doppler
- High PRF pulsed wave Doppler
- Continuous wave Doppler
- Zoom
- FULL screen imaging to enlarge imaging size
- Dual real time imaging without compromising imaging size
- PView for panoramic imaging *(Optional)
- TView for trapezoidal imaging
- Needle Enhancement*(optional)
- SGC (Scanline gain compensation)
- HSG
- 2D/3D auto follicle*(optional)
- Tomographic display (MCUT)
- Free 3D * (optional)
- 3D/4D imaging
- HQ*(Optional)
- HQ Silhouette *(Optional)
- Inversion mode*(Optional)
- Magic Cut *(Optional)
- Smart 3D Volume Calculation *(Optional)
- Multiline-Free View *(Optional)
- Volume Contrast Imaging(VCI)
- Niche view*(Optional)
- Color M-mode
- Tissue Doppler (TD) mode
- Tissue Velocity Imaging (TVI) mode
- Tissue Velocity M (TVM) mode *(optional)
- Elastography imaging
- Stress echo* (optional)
- Strain Imaging* (optional)
- Auto NT(Nuchal translucency)* (optional)
- Auto IT, automatic measurement of Intracranial translucency* (optional)
- VLuminous flow, a feature which shows the blood flow in a 3-D view with excellent sensitivity
- Curved M mode, user can draw any curved sample line freely and get corresponding results* (optional)
- Sync B/C width, the width of B mode interest area is always be the same with the CF mode
- Multi-line Angular M-Mode, Up to 4 sample lines* (optional)
- Live IMT, display intima-media thickness in real time*(Optional)
- VAim(Vinno Artificial Intelligent Measurement) for OB、Follicle、Hip、pelvic* (optional)

- 3D Smart Face, an intelligent tool for fetal face optimization*(Optional)
- VNavIn, a tool that navigates inside the 3D volume data and projects an inside-out perspective image that displays the inner most structures like virtual endoscopy*(optional)

1.4 Standard features

- Up to 25Mhz high frequency in system platform. Up to 22MHz’s probes are supported
- RF platform and RF data processing
- Up to 1500 seconds standard cine storage
- 1T HDD
- Integrated DVDRW
- Integrated black/white thermal video printer slot
- Patient information database
- Image archive on hard drive
- Quick store to USB memory stick
- Quick store to hard drive
- Quick print to B/W and color thermal video printer
- Network storage and printing
- Full measurement and analysis package
- Real time auto wave Doppler track and calculations
- Vascular calculations
- Cardiac calculations
- OB calculations and tables
- Gynecological calculations
- Urological calculations
- Renal calculations
- Volume calculations
- Barcode reader for patient information input*(optional)
- Wireless networking for easy data sharing, storage and printing *(optional)
- Bluetooth for image data transfer(optional)
- Image data transfer directly by E-Mail with network access(optional)
- Up-to-date connectivity and data management solutions, wireless , LAN, Bluetooth, E-Mail, integrated database
- DICOM compatibility*
- Three active probe ports, plus one dummy probe port
- 5 USB ports
- 8 TGC slides
- Average 4 multiple adjustable frequency in every probe and mode
- Up to 512 line density
- 1 DVI-D interface
- 1 Audio in interface; 1 Audio out interface
- 1 Speaker interface
- 1 RJ45 interface

1.5 Language support

- Software: Chinese, English, German, Greek, Malay,Portuguese, Romanian,

Spanish, Swedish, Norwegian, Danish, Finnish, French, Polish, Russian, Uighur, Italian, Czech, Hungarian, Cambodia

- Keyboard input: Chinese, English, German, Greek, Malay,Portuguese, Romanian, Spanish, Swedish, Polish, Norwegian, Danish, Finnish, French, Russian, Italian, Czech, Cambodia, Polski
- Control panel overlay: English
- User manual: Chinese, English, German, Russian, Portuguese, Spanish, Italian, French

2. Ergonomics

- Unique human oriented design for comfort and convenience
- Fully articulating 18.5-inch high resolution flat panel display
- lifted operation panel 150 mm
- Easy access DVD media drive
- 3 +1 transducer ports
- 4 transducer holders (removable for easy cleaning)
- Integrated touchable alphabetic keyboard
- Simple, easy and effective cable management structure

2.1 Keyboard

- Highly sensitive 10 inch LED technology touch panel
- Resolution: 1280*800 pixels
- Intuitive, configurable and touchable interactive operation interface
- Ergonomic hard keys for general ultrasound operations
- 8 TGC slides, functionality at any depth
- Backlight keys
- Independent up/down adjustment
    - Down/up range: 150 mm

2.2 Image display screen

- 18.5 inch high resolution LED technology, pixel resolution: 1366x768
- Brightness, contrast and color temperature adjustment
- View angle: -178° ~ 178°
- Number of color: 16.7M
- Adjustable Gamma curve optimization for dedicated applications
- Multifunctional support arm design
- Independent tilt and swivel adjustment
    - Swivel range: ±180degrees
    - Tilt range: -20-90degrees
    - Up/down arm: 150±80mm

2.3 Wheels

- Diameter: 125mm
- Front castor (2 ea): Total lock
  Rear castor (2 ea): Total lock

2.4 Touch gestures

- Swipe down/up: display/remove projected image on touch screen
- Swipe horizontally: page up/down or review images/cine loops one by one
- Swipe from left edge to right: display hidden menu on projected image.
- Image parameter adjustment
- Measurement on projected image on touch screen
- Zoom in/out the projected Image on touch screen
- Rotate or erase on projected 3D/4D image on touch screen

2.5 System boot-up

- Boot-up from shut-down: ≤62 sec
- Shut-down: ≤12 sec

2.6 Comments

- Supports text input and arrow
- Support freehand marking on touch screen
- Adjustable text size and arrow size
- Supports home position
- Covers various application
- User customizable

2.7 Bodymark

- More than 215 bodymarks for versatile application
- User customizable

2.8 Peripherals

- B&W thermal video printer: Sony UP-D898MD(optional)
- Color thermal video printer: Sony UP-D25MD (optional)
- Memory stick (optional)

2.9 Dimensions and Weight

- Height: 1260mm
- Width: 605mm
- Depth: 875mm
- Net Weight: 60kg

2.10 Electrical Power

- Voltage: 100-240V AC
- Frequency: 50/60Hz
- Power: Max. 600VA for console Only

2.11 Operating Environment

- Ambient temperature: 10-40° C

- Relative humidity: 30-75%
- Atmospheric pressure: 700hPa-1060hPa

2.12 Storage & Transportation Environment

- Ambient temperature: -5-50° C
- Relative humidity: 10%-80% (no condensation)
- Atmospheric pressure: 700hPa-1060hPa

3. Transducers

3.1 Transducer Technology

- Xcen technology for wideband frequency
- Pure wave technology for high resolution imaging
- Unique and high technical Xcen probe connector to adapt all different type of VINNO product models

3.2 Transducer types

- Convex array
- Linear array
- Phase array
- 4D probe
- Endocavity probe
- Micro-convex array

3.3 Transducer selection

- Electronic switching of transducers
- User customizable imaging presets for each transducer and application
- Automatic dynamic receiving focus in all transducers
- Multiple adjustable transmit focal zone, up to 8 focal zone

G2-5C Broadband Curved Array

- Field of view: 66 degree
- Convex radius: 50mm
- Application: abdomen, OB/Gyn, urology, pediatric
- Frequency range: 2.0 -6.0MHz
- Physical Footprint: 68.5mm x 27mm
- Center frequency: 3.2 MHz
- Transducer elements:128
- Pulsed wave Doppler, color Doppler, power Doppler, harmonic
- Multi-imaging frequency setting in 2D, Harmonic, color Doppler and Wave Doppler modes
- Reusable biopsy guide available

F2-5C Broadband Curved Array

- Field of view: 59 degree
- Convex radius: 60mm

- Application: abdomen, OB/Gyn, urology, pediatric
- Frequency range: 2.0 -6.5MHz
- Center frequency: 3.2 MHz
- Physical footprint: 72mm x 27mm
- Transducer elements:128
- Pulsed wave Doppler, color Doppler, power Doppler, harmonic
- Multi-imaging frequency setting in 2D, Harmonic, color Doppler and Wave Doppler modes
- Reusable biopsy guide available

D3-6C broadband curved array volume probe

- Field of view: 75 degree
- Convex radius: 40mm
- Application: abdomen, OB/Gyn, urology
- Frequency range: 3.0 – 6.0MHz
- Physical Footprint: 82mm×53mm
- Center frequency: 4.0 MHz
- Transducer elements:128
- Pulsed wave Doppler, color Doppler, power Doppler, harmonic, 3D/4D grayscale and 3D color modes
- Multi-imaging frequency setting in 2D, Harmonic, color Doppler and Wave Doppler modes

D3-6CE broadband curved array volume probe

- Field of view: 68 degree
- Convex radius: 40mm
- Application: abdomen, ob/gyn, urology
- Center frequency: 4.5 MHz
- Transducer elements:128
- B-mode Frequency range: 3-5.5MHz
- Physical footprint: 74mm×51mm
- Pulsed wave Doppler, color Doppler, power Doppler, harmonic, 3D/4D grayscale and 3D color modes

G4-9M broadband micro convex array

- Field of view: 138 degree
- Convex radius: 12mm
- Application: pediatric, abdomen, cardiac
- Frequency range: 5.0 – 11.0MHz
- Physical Footprint: 34mm × 29mm
- Center frequency: 7.0MHz
- Transducer elements:128
- Pulsed wave Doppler, color Doppler, power Doppler, harmonic
- Multi-imaging frequency setting in 2D, Harmonic, color Doppler and Wave Doppler modes

X4-9E broadband micro convex endocavity array(crank and straight handle)

- Field of view: 180 degree
- Convex radius:8.8 mm
- Application: ob/gyn, urology
- Frequency range:5.0-11.0 MHz
- Physical Footprint: 19.15mm x 17.8mm
- Center frequency: 3.2MHz
- Transducer elements:192

- Pulsed wave Doppler, color Doppler, power Doppler, harmonic
- Multi-imaging frequency setting in 2D, Harmonic, color Doppler and Wave Doppler modes

D4-9E broadband micro convex 4D endocavity array

- Field of view: 146 degree
- Convex radius: 10mm
- Application: Ob/Gyn, urology
- Frequency range: 5.0 - 11.0MHz
- Physical Footprint: 24.7mm x 23.7mm
- Center frequency: 6.5MHz
- Transducer elements:148
- Pulsed wave Doppler, color Doppler, power Doppler, harmonic , 3D/4D grayscale, 3D color
- Multi-imaging frequency setting in 2D, 3D/4D, Harmonic, color Doppler and Wave Doppler modes

X4-12L broadband linear array

- Fine pitch, high resolution
- Applications: vascular, small parts
- Aperture size: 38.4mm
- Frequency range: 6.0 -16.0MHz
- Physical Footprint: 50.5mm×17mm
- Center frequency: 7.8MHz
- Transducer elements:192
- Pulsed wave Doppler, color Doppler, power Doppler, harmonic
- Multi-imaging frequency setting in 2D, Harmonic, color Doppler and Wave Doppler modes
- Reusable biopsy guide available

X6-16L broadband linear array

- Fine pitch, high resolution
- Applications: vascular, small parts
- Aperture size: 38.4mm
- Frequency range: 7.3 -18.0MHz
- Physical Footprint: 50.5mm×20mm
- Center frequency: 10.5MHz
- Transducer elements:192
- Pulsed wave Doppler, color Doppler, power Doppler, harmonic
- Multi-imaging frequency setting in 2D, Harmonic, color Doppler and Wave Doppler modes
- Reusable biopsy guide available

U5-15LE broadband linear array

- Fine pitch, high resolution
- Applications: small parts, specially for breast, vascular
- Aperture size: 51.2mm
- Frequency range: 6.0 -14.0Mhz
- Physical Footprint: 65.5mm×25.5mm
- Center frequency: 7.3MHz
- Transducer elements: 256
- Pulsed wave Doppler, color Doppler, power Doppler, harmonic
- Multi-imaging frequency setting in 2D, Harmonic, color Doppler and Wave Doppler modes

X3-10L Low-frequency linear array

- Applications: Musculoskeletal, Peripheral Vascular
- Aperture size: 44.16mm
- B mode Frequency: 4-10MHz
- Physical Footprint: 60.18mm × 25.2mm
- Center frequency: 5.5MHz
- Transducer elements:192
- Pulsed wave Doppler, color Doppler, power Doppler, harmonic
- Multi-imaging frequency setting in 2D, Harmonic, color Doppler and Wave Doppler modes

G1-4P phased array

- Applications: cardiac, abdomen
- Field of view 90 degree
- Aperture size: 17.92mm
- Frequency range: 2.0-5.0Mhz
- Physical Footprint: 34.5mm×28.5mm
- Center frequency: 2.5MHz
- Transducer elements: 64
- Pulsed wave Doppler, continuous wave Doppler, color Doppler, power Doppler, harmonic
- Multi-imaging frequency setting in 2D, Harmonic, color Doppler and Wave Doppler modes
- Reusable biopsy guide available

F4-9E broadband micro convex endocavity array

- Field of view: 156degree
- Convex radius: 10mm
- Application: Ob/Gyn, urology
- Frequency range: 5.0 - 11.0MHz
- Center frequency: 3.2MHz
- Physical footprint: 21.0mm (lens) x 19.0mm(lens)
- Transducer elements:128
- Pulsed wave Doppler, color Doppler, power Doppler, harmonic
- Multi-imaging frequency setting in 2D, Harmonic, color Doppler and Wave Doppler modes
- Reusable biopsy guide available

F4-12L broadband linear array

- Fine pitch, high resolution
- Applications: vascular, small parts
- Aperture size: 38.4mm
- Frequency range: 6.0 -16.0MHz
- Center frequency: 7.5MHz
- Physical footprint: 50mm×18.5mm
- Transducer elements:128
- Pulsed wave Doppler, color Doppler, power Doppler, harmonic
- Multi-imaging frequency setting in 2D, Harmonic, color Doppler and Wave Doppler modes
- Reusable biopsy guide available

G3-10PX phased array

Application: pediatric cardiology, abdomen

Aperture size: 15.36 mm

Field of view: 90 degree

- Frequency range: 3.0-10.0Mhz

- Physical Footprint: 33mmx 33mm
- Center frequency: 4.7MHz
- Transducer elements:96
- Pulsed wave Doppler, color Doppler, power Doppler, harmonic
- Multi-imaging frequency setting in 2D, Harmonic, color Doppler and Wave Doppler modes

X9-22L broadband linear array

- Fine pitch, high resolution
- Applications: msk,nerve,small parts
- Aperture size: 28.8mm
- Frequency range: 9.0-22.0MHz
- Physical Footprint: 49.5mm x 22mm
- Center frequency: 14.0MHz
- Transducer elements:192
- Pulsed wave Doppler, color Doppler, power Doppler, harmonic
- Multi-imaging frequency setting in 2D, Harmonic, color Doppler and Wave Doppler modes

S2-9C Broadband Curved Array

- Field of view: 60 degree
- Convex radius: 60mm
- Application: abdomen, ob/gyn, urology, pediatric
- Frequency range: 2.0-8.0 MHz
- Physical Footprint: 79mm×31mm
- Center frequency: 3.5MHz
- Transducer elements:128
- Pulsed wave Doppler, color Doppler, power Doppler, harmonic
- Multi-imaging frequency setting in 2D, Harmonic, color Doppler and Wave Doppler modes

X2-6C Broadband Curved Array

- Field of view: 62 degree
- Convex radius: 60mm
- Application: abdomen, ob/gyn, urology, pediatric
- Frequency range: 2.0-5.5MHz
- Physical Footprint: 78mm × 28mm
- Center frequency: 3.5MHz
- Transducer elements:192
- Pulsed wave Doppler, color Doppler, power Doppler, harmonic
- Multi-imaging frequency setting in 2D, Harmonic, color Doppler and Wave Doppler modes

G4-9E broadband micro convex endocavity array

- Field of view: 138 degree
- Convex radius: 11.5mm
- Application: Ob/Gyn, urology
- Frequency range: 5.0 – 11.0MHz
- Physical Footprint: 24.0mm x 18.8mm
- Center frequency: 6.9MHz
- Transducer elements:128
- Pulsed wave Doppler, color Doppler, power Doppler, harmonic
- Multi-imaging frequency setting in 2D, Harmonic, color Doppler and Wave Doppler modes

- Reusable biopsy guide available

D3-6CX broadband curved array volume probe

- Field of view: 75 degree
- Convex radius: 40mm
- Application: abdomen, OB/Gyn, urology
- Frequency range: 1.8 – 7.2MHz
- Center frequency: 3.85 MHz
- Physical footprint: 65mm×45.2mm
- Transducer elements:128
- Pulsed wave Doppler, color Doppler, power Doppler, harmonic , 3D/4D grayscale, 3D color
- Multi-imaging frequency setting in 2D, 3D/4D, Harmonic, color Doppler and Wave Doppler modes

I4-11T broadband linear array

- Fine pitch, high resolution
- Frequency range: 6.0-12.0Mhz
- Physical Footprint: 48mm×15mm
- Center frequency: 7.5MHz
- Transducer elements:128
- Pulsed wave Doppler, color Doppler, power Doppler, harmonic
- Multi-imaging frequency setting in 2D, Harmonic, color Doppler and Wave Doppler modes

4. Advanced Imaging controls

4.1 VFusion

- Available on all transducers and for 2D, 3D/4D (except phase array probe)
- Operate in conjunction with VSpeckle, harmonic imaging

4.2 VSpeckle

- Available on all transducers and for 2D, 3D/4D
- Virtually eliminate speckle noise artifact and dynamically enhances tissue margins
- Selectable multiple levels of speckle noise reduction and smoothing
- Operates in conjunction with VFusion and harmonic imaging

4.3 VTissue

- Advanced imaging processing to adapt to the speed of the ultrasound variation in different tissue
- Improved detail resolution and conspicuity of lesions
- Presentable sound and speed in different applications
- One touch operation to ease diagnosis
- Better detection in diffuse lesions of organs

4.4 3D/4D

4.4.1 Inversion mode(Optional)

- This render mode is used to

display anechoic structures such as vessels

- It invert the gray values of the rendered image, such as black image information become white and vice versa

4.4.2 Magic Cut(Optional)

- Ability to edit images, make possible to cut away structure obstructing the view in the ROI
- Several cutting methods available
- Have quality index to indicate if there is proper external force

4.4.3 Free View(Optional)

- Provide any plane view to visualize the internal tissue information
- Improve the contrast resolution to facilitate the detection of diffuse lesions in organs

4.4.4 Volume Contrast Imaging(VCI)

- Increases the tissues demarcation inside the adjustable slab
- Renderes images with improved contrast resolution

4.4.5 Niche view(Optional)

- Display 3 orthogonal planes centered on ROI
- Use Depth to translate the selected plane
- Each imaging plane or Niche image can be selected using image reference

4.4.6 3D Smart Face(Optional)

An intelligent tool for fetal face optimization. This tool detects the fluid/tissue interface and smartly removes noise in front of the baby inside the ROI, to obtain an optimal baby face.

- Use Auto key on the keyboard to remove the obstacle in front of the baby
- Only works on 3D Render
- Can not use this feature together with MagicCut

4.5 Next generation RF-based image processing

- Available on all imaging transducers in 2D grayscale modes
- Virtually eliminates speckle noise artifact and dynamically enhance tissue edge
- Operates with other real-time processing algorithms

4.6 Tissue Doppler (TD)

- Present wall motion spectrum by using Doppler principle
- Provide wall motion direction and

velocity information

4.7 Tissue Velocity Imaging (TVI)

- Color codes the velocities in tissue
- Present tissue color imaging by using Doppler principle
- This color image is overlaid onto the 2D image
- Captures low flow but high amplitude signals associated with wall motion

4.8 Stress Echo*(Optional)

- Stress echo is a non-invasice, dynamic evaluation of myocardial structure and its function under an external stress(exercise or pharmocology)
- 12 Ready to use templates (max 8 stages * 6 views) Editable
- User definable template
- Re-arrange & Select default template
- 8 View names available
- 9 Stage names are available (can add user defined stage name)
- One Touch Shuffle (Stage / View)
- Touch & Compare any view of stage
- Systole only review

4.9 Strain Imaging*(Optional)

- Auto-ROI (after selecting Mitral Valve Plane)
- Adjust Segment-wise (Longitudinal strain)
- Adjust Segment-wise and Rotate whole ROI (Radial & Circumf. Strain)
- ECG to select heart cycle
- View based Bulls Eye view
- Result type (Peak Strain or Peak Time)Parameter type (L Strain, R Strain& C Strain)

4.10 Tissue Velocity M mode(TVM) *(Optional)

- Color codes the velocities in tissue
- Present wall motion spectrum based on tissue moving
- This color image is overlaid onto the 2D image
- Captures low flow but high amplitude signals associated with wall motion

4.11 Multi-angle M mode *(Optional)

- Sample on moving tissue from multi-angle
- Present wall motion spectrum based on tissue moving

5. Imaging modes

5.1 2D Imaging

- Pre-defined ATGC (adaptive

temporal gain compensation) curves optimized for consistently excellent imaging

- Display format：Single, Dual, Quad
- B/M acoustic output: 0-100%
- Depth: able to adjust from 1 to 40cm
- Select between 1 to 8 transmit focal zones
- Reverse function: on/off
- 2D optimization: on/off
- Centerline: on/off
- L/R flip and U/D flip: on/off
- VFusion ： ≧ 7steps
- VSpeckle ： ≧ 13 steps
- Harmonic imaging both tissue harmonic and phase inversion
- Cineloop image review
- Selectable 2D line density
- Dual imaging with independent cineloop
- 256(8 bit) gray level
- Up to 8 focus zone adjustable
- Multiple color maps with chroma imaging
- FULL screen imaging to larger image size
- Multi frequency: ≧ 4 levels, probe dependent
- Gray filter: ≧ 7 steps
- Persistence: ≧ 8steps
- Selectable image angles, probe Dependent
- Gain: 0-100%
- Dynamic range: 30-280 db
- VSharpen(enhance edge contrast) ： ≧ 8steps
- Smooth(improve spatial resolution): ≧ 11steps
- EdgeEnhance (improve detail information and contrast): ≧ 6steps
- VNear to enhance SNR of near field, 4steps
- Gray Map：≧ 32types
- Tint Map：≧ 24types
- TGC：8 slides on control pannel
- SGC：8 ponds on touch pannel
- TI heat index: TIB, TIS, TIC
- Rotation: 0°,90°,180°,270°
- Zoom(up to 10×)

5.2 Harmonic Imaging

- Supports both tissue harmonic and phase inversion imaging (transducer and frequency dependence)
- Second harmonic processing to reduce artifacts and improve image clarity
- Maximize detail resolution and enhance contrast
- Available on all imaging transducers
- Extends high performance imaging capabilities to all patient body types

5.3 M mode

- Selectable sweeping rates, ≧ 10steps
- Time marks: 0.025 – 0.5 second
- Selectable display format prospective or retrospective (V2/3, V1/3, V1/2, H1/2, H3/4, full screen)
- Chroma colorization with multiple color maps
- Cineloop review for retrospective analysis of M-mode data
- 256 gray levels
- Acoustic output：10%-100%
- Gray filter：≧ 7steps
- Dynamic range：108db-128db, 2db/step
- Vsharpen: ≧ 6steps
- Gray Map: ≧ 32types
- Tint Map: ≧ 24types
- Gain: 0-100%
- Color M mode：available
- MultiAngle：available

5.4 Color Doppler mode

- Available on all imaging transducers
- Automatically adapts transmit and receive bandwidth processing based on the color box position
- Cineloop review with full playback control
- Steering on linear array transducers
- Color flow M mode display for tissue motion and flow velocity(optional)
- Reverse function: on/off
- Selectable baseline, line density, flash reduction, persistence, maps, frequency, PRF, wall filter, packet size, color level, sensitivity, focus position, acoustic power, and smooth
- FULL screen imaging to larger image size
- L/R flip and U/D flip: on/off
- Frequency：≧ 4steps, depend on probes
- Baseline：0-100%
- Acoustic power：5% -100%
- Line density：≧ 6 steps
- Flash reduction：≧ 6 steps
- Persistence：≧ 20 steps
- Color Map：≧ 33types
- Smooth ：≧ 7steps
- Sensitivity：≧ 5 steps
- Transparency：≧ 6steps
- Color level：≧ 14 steps
- Packet size：≧ 7 steps
- Reverse function: on/off
- Color gain：0-100%
- Adjustable region of interest
- Region of interest
- Baseline invert
- Simultaneous mode during PW mode
- Zoom

5.5 Power Doppler mode

- High sensitive mode for small vessel visualization
- Available on all transducers
- Cineloop review
- Display format：Single, Dual, Quad
- Selectable baseline, line density, flash reduction, persistence, maps, frequency, PRF, wall filter, packet size, color level, sensitivity, focus position, acoustic power, and smooth
- Color maps：≧ 24 types
- Color levels：≧11 steps
- Sensitivity：≧ 5steps
- Smooth：≧ 7steps
- Persistence：≧ 20steps
- Individual controls for gain
- Adjustable region of interest

5.6 Pulsed Wave (PW) Doppler

- Ultra high resolution spectral FFT rate
- Angle correction with automatic velocity scale adjustment
- Normal, invert display around horizontal zero line
- Auto optimization: on/off
- Invert: on/off
- Selectable display format prospective or retrospective (V2/3, V1/3, V1/2, H1/2, H3/4, full screen)
- Selectable gray filter, dynamic range, frequency, PRF, wall filter, baseline, angel correct, sample volume
- Gray filter: ≧ 6steps
- Dynamic range: 108db-128db
- Baseline: 5%-95%
- Sample volume: 0.5mm-10mm
- Angle correct：-80° ~ 80°
- Sensitivity: ≧ 21steps
- Audio Volume: ≧ 21steps
- Spectrum Optimize: ≧ 28steps
- Gray map: ≧ 13types
- Tint map: ≧ 11types
- Selectable sweep speeds: 10 steps
- Maximum velocity range: 12m/s
- PW acoustic output: 5%-100%
- Trace direction: above, below, above and below
- Trace type: max, mean, max and mean
- Cardiac cycle: 1-5
- Selectable low frequency signal filtering with adjustable wall filter settings
- Selectable grayscale curve for optimal display
- Selectable chroma colorization maps
- Auto function to optimize spectral Doppler displ.
- Digitally enhanced stereo output
- 256 gray levels

- Post-processing in frozen mode includes map, baseline, invert and chroma
- Simultaneous or duplex mode of operation
- Simultaneous 2D, color Doppler, pulsed Doppler
- High PRF capability in all modes including duplex and triplex

5.7 Continuous Wave Doppler (CWD)

- Cardiac sector array transducer only
- User can measure distance and area
- Measurement can be made on individual frames during cineloop review

5.8 Elastography imaging

- Shows the spatial distribution of tissue elasticity properties in a region of interest to estimate the strain before and after tissue distortion caused by external force
- The strain estimation is scaled by color to have smooth distribution display
- Have quality index to indicate if there is proper external force
- Winsize: 0,1,2,3,4
- Overlap: 0,1,2,3,4
- Dynamic range: 0-10
- Sensitivity: 0,1
- Transparency: ≧ 13steps
- Smooth: ≧ 7steps
- Line density: ≧ 7steps
- Persistence: ≧ 20steps
- Map: EI0
- Display format：Single, Dual, Quad

5.10 3D/4D

- 3D/4D rotation
- Grayscale imaging controls
- Selectable rendering Approaches：HQ Surface, HQ Grad,HQ Silhouette, Surf Texture, Surf Smooth, Grad Light, Surf HDR, Trans Max, X-ray,Transp Min,Light
- Unique high quality rendering algorithm
- Review volume
- Volume Angle:15%-75%
- Quality:low,mid,good,high,best
- Threshold:256
- Transparency:0.1-2, 0.1/step
- Category:Face,Spine,Brain, Heart,Hi speed,Lip&plate,Limbs, Custom
- Display format: single,dual,MRP,Quad
- Image Reference:A,B,C,3D
- Flip: 0°,90°,180°,270°
- View：Front/Back，Back/Front; Left/Right，Right/Left; Up/Down，Down/Up

- Rotation Direction：X, Y, Z
- 3D Map：≧ 8types
- Tint maps: ≧ 24Types
- Gray maps: ≧ 32Types
- 2D VSpeckle：≧ 3types
- 3D VSpeckle：≧ 3types
- Render Type：Gray，Graylnv
- Inverse Avaliable

- **MCUT(Optional)**
- Slice Number：2×2，3×3，4×4，5×5
- Max Slice Number：25
- Gray Map：≧ 32 types
- Tint Map：≧ 24 types
- Cut plane：A,B,C
- Rotation Direction：X, Y, Z
- Volume Angle: 15°-75°
- Interval: 1mm-20mm, 0.5mm/step
- Quality：low,mid,good,high,best

- **Free view(optional)**
- Direction: X, Y, Z
- Route: curve, straight line
- Reference image: A,B,C
- Slice thickness: 0mm-20mm
- Active line: 1,2,3
- Mix: 10-90
- Threshold: 256steps
- Transparency: 0.1-2.0, 0.1/step

- **Magic cut(optional)**
- Erase mode: inside lasso, outside lasso,big circle, small circle
- Erase type: trace, rectangle, ellipse
- Rotation direction: X, Y, Z

- **VOCAL*(Optional)**
- Vocal layers: 8, 12,16,20,24,28,32
- Display format：single, Quad
- Image reference: A, B, C

- **Niche view*(Optional)**
- Model type: upper, lower
- Display format: single, quad
- Rotation direction: X, Y, Z
- Image reference: A, B, C, N

5.11 PView (Optional)

- Real time extended field of view composite imaging
- Ability to back up and realign the image during acquisition
- Full zoom, cineloop review and image rotation capabilities

5.12 TView

- Expand view of scanning
- Available on linear transducers

5.13 Auto

- Intelligent one button automatic optimization in 2D and

Doppler modes
- Automatically adjust PRF and baseline in Doppler

5.14 Tissue Doppler Imaging (TD)

- Present wall motion spectrum by using Doppler principle
- Provide wall motion direction and velocity information
- Available on all sector transducer for cardiac imaging
- Selectable frequency, PRF, Focus position, wall filter
- Gain
- Sweep speed: ≧ 10steps
- Baseline: 5%-95%
- Angle correct: ±80°
- Sample volume: 0.5mm-10mm, 0.5mm/step
- Spectrum optimize: ≧ 20steps
- Acoustic power: 5%-100%
- Dynamic range: 108db-128db
- Trace sensitive: ≧ 21steps
- Gray filter: ≧ 6steps
- Audio volume: ≧ 21steps
- Mode: max, mean, both
- Direction: above, below, both
- Heart cycle: 1-5
- Gray map: ≧ 13types
- Tint map: ≧ 11types

5.15 Tissue Velocity Imaging (TVI)

- Color codes the velocities in tissue
- Present tissue color imaging by using Doppler principle
- This color image is overlaid onto the 2D image
- Captures low flow but high amplitude signals associated with wall motion
- Available on all sector transducer for cardiac imaging
- Tissue velocity M mode display for wall motion(optional)
- Gain
- Velocity
- Color level: ≧ 11steps
- Transparency: ≧ 12steps
- Smooth: ≧ 7steps
- Line density: ≧ 3steps
- Persistence: ≧ 7steps
- Color map: ≧ 10types

5.16 Tissue Velocity M mode (TVM) *(Optional)

- Color codes the velocities in tissue
- Present wall motion spectrum based on tissue moving
- This color image is overlaid onto the 2D image
- Captures low flow but high amplitude signals associated with wall motion

- Selectable frequency, PRF, Focus position
- Baseline: 5%-95%
- Color level: ≧ 11steps
- Transparency: ≧ 13steps
- Packet size: 3,4,5,6
- Acoustic power: 5%-100%
- Display format：Single, Dual, Quad

6. Touch Panel Interface

6.1 2D mode

- New patient
- BodyPattern
- Archive
- Comments
- End exam
- Sys setting
- Probe&App
- Pview
- Tview
- Fullscreen
- L/R
- U/D
- Center line
- VTissue*
- VSpeckle
- VFusion
- Gray Filter
- Persistence
- Display Format
- Image reference
- Maps
- Frequency
- Focus position
- Focus
- Dynamic Range
- Line density
- VSharpen
- Biopsy
- Image angle
- Focus width
- Smooth
- Acoustic power
- Contrast imaging
- Elastosonography
- EdgeEnhance
- Vnear
- NeedleEnhance
- SGC

6.2 M Mode

- New patient
- BodyPattern
- Archive
- Comments
- End exam
- Sys setting
- Probe&App
- L/R format
- U/D format
- Maps
- Dynamic range
- Acoustic power
- Sweep speed
- Gray filter
- VSharpen

- ECG

6.3 CF mode

- New patient
- BodyPattern
- Archive
- Comments
- End exam
- Sys setting
- Probe&App
- Invert
- Full Screen
- L/R
- U/D
- Baseline
- Flash Reduction
- Line density
- Persistence
- Display format
- Sync display
- Transparency
- Image reference
- Maps
- Frequency
- PRF
- Wall filter
- Packet size
- Colorlevel
- Sensitivity
- Focus position
- Acoustic power
- Smooth

6.4 PW/CW mode

- New patient
- BodyPattern
- Archive
- Comments
- End exam
- Sys setting
- Probe&App
- Invert
- Triplex
- Display format
- Sweep speed
- Gray filter
- Dynamic range
- Trace sensitive
- Auto trace
- Mode/direction
- Maps
- Frequency
- PRF
- Wall filter
- Baseline
- Steer
- Sample volume
- Volume
- Spectrum optimize
- Acoustic power

6.5 3D mode

- Comments
- BodyPattern
- Back to 2D

- Start3D
- Render
- Display format
- Image reference
- View
- Gray map
- VSpeckle
- Quality
- Threshold
- Transparency
- Volume angle
- Auto rotate (after data acquisition)
- Movement step (after data acquisition)
- Slice position(after data acquisition)
- Speed(after data acquisition)
- HQ Grad Light(after data acquisition)
- Rotation angle (after data acquisition)
- Rotation direction (after data acquisition)
- 3DMcut(after data acquisition)
- Magic Cut (after data acquisition)
- Free View(after data acquisition)
- Smart Touch 3D/4D operation(after data acquisition)

6.6 4D mode

- Comments
- Body Pattern
- Back to 2D
- Start 4D
- Auto Cine
- Movement step
- Rotation direction
- Render
- Display format
- Image reference
- View
- Gray map
- VSpeckle
- Quality
- Threshold
- Transparency
- Volume angle
- Slice position(after data acquisition)
- 3DMcut(after data acquisition)
- Smart touch 3D/4D operation(after data acquisition)

7. System Feature

7.1 Display modes

- Simultaneous capability
    - 2D/PW/CW
    - 2D/CF or PDI
    - 2D/M
    - Dual, 2D/2D
    - Dual, 2D/2D+CF or PDI
    - Dual, duplex and triplax

- Duplex and Triplex mode
- Quad display in 3D/4D application
- 25 slice images display in 3D/4D application
- Time line display
- Independent dual 2D/PW or CW
- Timed based sweep update mode

7.2 Display annotation

- Institution/hospital name
- Date: 3 types selectable, Year-Month-Day, Day-Month-Year, Month-Day-Year
- Time: 2 types selectable, 24hours and 12 hours
- Operator identification
- Patient name, first, last
- Patient identification: 30 characters
- Gestational age from LMP/BBT/DOC/IVF/GA/Avg.US
- VINNO image symbol: Ginkgo leaf
- Power output index
  - MI: mechanical index
  - TIS: thermal index soft tissue
  - TIC: thermal index cranial (Bone)
  - TIB: thermal index bone
- Probe orientation marker: coincide with a probe orientation marking on the probe
- Gray/color bar
- Measurement result window
- Probe type
- Application name
- Image depth
- Imaging parameters by mode
  - 2D/M mode: acoustic power output, gain, frequency, frame rate, dynamic range
  - Color mode: color acoustic power output, color gain, color flow frequency, PRF, wall filter
  - PW/CW mode: Doppler acoustic power output, Doppler gain, Doppler frequency, PRF, wall filter, sample depth
- Scanline Gain Compensation(SGC) with 6 slides adjustment
- Focus zone marker
- Body pattern
- PW and CW scale markers: time/speed
- M scale markers: time/depth, time
- System measurement display
- System message display
- Biopsy guide line
- Heart rate

7.3 Simple User Operation Interface

- Simple user interface and easy workflow, allows one step on probe & application switch, and intuitive user parameter control

7.4 Cineloop

- Acquisition, storage in memory and display of up to 30000 frames, 1500 seconds long of 2D, color and PW/CW images for review
- Avaliable to decide StartFrame and EndFrame
- Frame by frame manual cine loop review or auto playback with variable speed:
400%, 200%, 100%, 60%, 50%,40%, 20%
- Frame compare: displays one cine in dual format and allows frame by frame compare side by side
- Acquisition, storage and replay of Doppler audio

7.5 Quick save feature

- The system provides quick save function through USB stick, internal/external HDD, DVD during or after exam
- Configurable saving file format, VRD (VINNO Raw Data), DICOM, PNG,BMP,JPG , MP4 and AVI

7.6 Physio (Optional)

- One 3-lead ECG input
- Gain, sweep rate and display position controls
- Automatic heart rate calculation and display
- Fault condition display

7.7 Archive

- Patient data input which include patient ID, name,birth date, sex, exam physician, quality check, exam operator
- Physical data such as weight, height
- Patient exam management
- Patient exam images storage and management
- Import VRD format data into the system from outside media, such as USB stick, external HDD, DVD
- Export patient data into outside medias

7.8 Report

- Automatically pull patient data into the report
- Automatically load

measurement worksheet into the report

- Pull related exams' images into the report
- Write comments in the report
- Print report through network or local printer

7.9 Connectivity

- Standard connectivity features
    - Local print to on-board or off-board video printers through USB port
    - Page report print
    - Image export to removable media (DVD, external HDD, USB stick)
- Ethernet Network Connection
    - Cable connection
    - Wireless connection: need wireless routing adaptor
- Network linkage
    - Image export to network storage servers*
    - DICOM export and retrieve *
- Mobile data transfer solution by
    - Blue tooth*(Optional)
    - email*(Optional)
    - Hot point connection
- VCloud * (Optional)
- Integrated DVDRW
    - Support standard DVD media
    - Data storage formats include VRD, DICOM, JPEG,BMP,PNG, AVI
    - JPEG,BMP,PNG,VRD and DICOM images stored in disc can be recalled on the VINNO system
    - PNG and AVI images can be played on normal computers
- On-board patient exam storage
- Direct digital storage of static image or cineloop images to internal hard disk drives
- Fully integrated user interface

7.10 Probes/application

- Selectable multiple applications
- Edit exist application preset
- Edit user defined preset
- Rename preset
- Return to factory preset
- Quick save user defined parameters in related application

7.11 Safety Conformance

- Regulatory Notice:

This device is tested to meet all applicable requirements in relevant. According to 93/42 EEC, it is class IIa medical device.

- Conformity to Standards:
    - IEC 60601-1 : 2012 Medical

electrical equipment - Part 1: General requirements for basic safety and essential performance

- IEC 60601-1-2:2007 Electromagnetic compatibility - Requirements and tests
- IEC 60601-1-6:2010 Usability
- IEC 60601-2-37:2007 Medical electrical equipment - Particular requirements for the safety of ultrasonic medical diagnostic and monitoring equipment
- IEC 61157:2007 Declaration of acoustic output parameters
- ISO 10993-1:2009 Biological evaluation of medical devices
- IEC 62304:2006 Medical device software – Software life cycle processes
- IEC 62366:2007 Medical devices - Application of usability engineering to medical devices
- Council Directive 93/42/EEC on Medical Device
- WEEE according to 2012/19/EU
- RoHS according to 2011/65/EU

8. Measurement and Analysis

8.1 Measurement in different modes

8.1.1 Generic Measurement in 2D mode

- Depth
- Distance
- Perimeter
    - Length and width method
    - Ellipse method
    - Polygon method
    - Spline method
    - Tracing method
- Area
    - Length and width method
    - Ellipse method
    - Polygon method
    - Spline method
    - Tracing method
- Volume
    - Single line method
    - Dual line method
    - Triple line method
    - Single ellipse method
        - Single ellipse and single line method
- Angle
- Stenosis
    - Diameter method
    - Square meter method
- A and B ratio
    - Diameter ratio

- Square meter ratio

8.1.2 Generic Measurement in CFM mode

- CFV
  - point
  - profile

8.1.3 Generic Measurement in M mode

- Depth
- Distance
- Time
- Speed
- Heart rate
- Stenosis
- A and B ratio
  - Diameter ratio
  - Time ratio
  - Speed ratioGeneric

8.1.4 Measurement in PW mode

- Speed (include PV (Peak Velocity))
- Time (include AT (Accelerate Time))
- Acceleration
- PS (Peak Speed in systole period)
- ED (The speed in the end of diastole period)
- MD (Minimum speed in diastole period)
- TAMAX (maximum speed in time average)
- TAMEAN (mean speed in time average)
- TAMIN (minmum speed in time average)
- PI (Pulsatility Index)
- RI (Resistance Index)
- PS and ED ratio
- ED and PS ratio
- A and B ratio (A/B ratio)
  - Speed ratio
  - Time ratio
  - Acceleration ratio
- FLOWVOL (Flow Volume)
- MaxPG (maximum pressure gradient)
- MeanPG (Mean pressure gradient)
- SV (Stroke Volume)
  - Each volume diameter cardiac
  - Time mean speed in each stroke volume
  - Cardiac output
- Heart rate
- SV(LVOT)/SV(RVOT)

8.2 Measurement in different applications

8.2.1 Abdominal Measurement

- General abdomen
- Difficult abdomen
- Kidney

- Renal vessel
- Abdominal trauma

8.2.2 Small Part Measurement

- Thyroid
- Breast
- Testis
- Musculoskeletal
- Upper and lower extremity joint
- Nerve block

8.2.3 Vessel Measurement

- Carotid artery
- Upper artery
- Upper vein
- Lower artery
- Lower vein
- Vessel puncture
- Transcranial Doppler

8.2.4 Gynecology Measurement

- Uterus and Plevis
- Follicle

8.2.5 Urology Measurement

- Bladder
- Prostate
- Renal
- Kidney and ureter
- Pelvic Floor dysfunction

8.2.6 Pediatric Measurement

- Neonatal Head
- Neonatal Abdomen
- Pediatric Abdomen
- Pediatric Hip

8.2.7 Obstetrics Measurement

- OB Early
- OB Mid
- OB Late
- Fetal Heart

8.2.8 Cardiac Measurement

- General
- LV
- MV
- Ao
- AV
- LA
- RV
- TV
- PV
- RA
- System

8.2.9 Auto NT (Nuchal Translucency) measurement(Optional) *

- Automatically detect Nuchal Translucency in interest box
- Automatically report thickness result of NT

8.2.10 Auto IMT (Intima-Media Thickness) measurement (Optional) *

- Automatically detect intima media thickness in interest box
- Automatically report the result of IMT
- Available in linear probe

8.2.11 Live IMT (Intima-Media Thickness) measurement (Optional) *

- Real-time automatically display IMT items with the different ROI positions
- The IMT items include: max, min, average, SD, points (how many points are used for the result), size of ROI .
- Available in carotid application

8.2.12 Auto IT (Intracranial translucency) measurement(Optional) *

- Support Auto IT(Intracranial translucency) measurement
- Draw the ROI and the system analyses and displays the result

8.2.13 Auto Follicle(2D/3D)(Optional) *

- Just click on the area of follicle in B mode, the area of this follicle will be reported automatically
- Report the area of different follicle in the volume data automatically

8.2.14 Smart 3D Volume Measurement(Optional) *

- Trace the margin of the irregular circle in different slices of volume data in irregular shape
- Automatically report the volume of the irregular object

8.2.15 VAim OB measurement (Optional) *

- VAim OB is an intelligent tool for fetal growth calculation, just one touch to activate the measurement items （BPD, OFD, HC, AC, FL, HL）and get the results, helps to make clinical decisions quickly and confidently, improving the speed and ease of exams
- The intelligent results will be add into the worksheet and report automatically

8.2.16 VAim Hip measurement (Optional) *

VAim Hip is an intelligent solution in the assessment of DDH(Developmental Dysplasia of Hip) with one simple touch.

- Based on ‘Ped HIP’ application

8.2.17 VAim Follicle（2D）measurement (Optional) *

An intelligent tool for follicle calculation, one touch to get the follicle status,
dedicated for women's reproductive health.

- Choose left or right follicle
- Automatically identity all the follicles with different colors and calculate follicle volume and diameter

VINNO Technology (Suzhou) Co., Ltd

VINNO is focusing on producing premium diagnostic ultrasound development to provide customer clinical value through Continuous Innovation, Excellent Performance and Accessible Solutions.

Thanks you for your interest in VINNO.

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