

# VINNO<sup>10</sup>



Data sheet  
V1.14



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## Ultrasound System Specifications

The premium performance of the full functional Portable VINNO 10 provides a fast and easy diagnosis by:

- New multistage pulse emission platforms (Vlucid) deliver improved image contrast and resolution
- All ranges of features, functions and probes
- Ease of use and ergonomic design

### 1. System Overview

#### 1.1 Architecture

- New multistage pulse emission platform (Vlucid) : single focused emission, forming multiple receiving lines, through phase correction, eliminate artifacts. Through the coherent combination of receiving lines at the same position of different transmissions, the contrast and signal-to-noise ratio of the image are improved obviously, while the time resolution of the image remains the same, and the penetration of the image is improved.

- Thanks to the Vlucid platform, it allows the development of many raw data-based processing algorithms, which have ultra-premium contrast and resolution imaging



- This unique platform is capable of processing multiple data streams simultaneously
- World-class Up to 25MHz imaging performance
- Directional-enhanced information compiling for more tissue detail and reduction of angle-generated artifacts
- 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
- 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
- Multi-processors allow simultaneous mode changes and support for advanced system functionality
- World-class design to be thinner and lighter
- 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 V8 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
- Less 50 sec boot up time for easy mobile ability

## 1.2 Applications

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



### 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
- 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
- Free 3D
- 3D/4D Imaging(optional)\*
- HQ(optional)\*
- HQ Silhouette (Optional)
- Tomographic display (MCUT) (optional)\*
- Inversion mode(optional)\*
- Magic cut(optional)\*
- Multiline-Freeview(optional)\*
- Niche view(optional)\*
- Light Lab, allowing user to customise the position and direction of multiple virtual light sources(optional)
- Color 3D(optional)
- Three leads ECG function(optional) \*
- Tissue Doppler (TD) mode
- Tissue Velocity Imaging (TVI) mode(optional) \*
- Tissue Velocity M mode (TVM)(optional)\*
- Multi-angle M mode (optional)\*
- Color M-mode(optional)\*
- 2D/3D auto follicle(optional)\*
- PDI function
- Auto needle enhancement(optional)\*
- VGuide(optional)\*
- Elastic Imaging(EI) (optional)\*
- VShear, a non-invasive method which can calculate tissue elastic modulus(optional)
- Contrast Imaging (optional)\*
- PWV, a real-time, multi-point, RF



tracking at single imaging site of the carotid artery intima media complex with high precision and generates arterial distension/tracking waveform. Calculates PWV to assess the arterial stiffness and risk stratification of arteriosclerosis(optional)

- AMAS, a two-imaging site protocol, time delay between ECG R to foot (inflection point) of the Common Carotid artery and Femoral artery PW Doppler is auto calculated. Key-in the distance between Carotid and Femoral artery, system calculates the cf PWV(optional)
- Stress echo(optional)\*
- Strain Imaging(optional)\*
- VAid Breast \* (optional)
- VAid Thyroid \* (optional)
- VAid Liver \* (optional)
- Auto NT(Nuchal 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
- 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 for OB、Follicle、Hip、pelvic(Optional)\*
- 3D Smart Face, an intelligent tool for fetal face optimization(Optional)\*
- Auto IT, automatic measurement of Intracranial translucency(Optional)\*

#### 1.4 Standard features

- Up to 25Mhz high frequency in system platform. Up to 23MHz' s probes are supported
- Up to 1500 seconds cine storage
- 512GB SSD quick boot up and storage
- Patient information database
- Image archive on hard drive
- Quick store to USB memory stick
- Quick store to hard drive
- Report package
- 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
- Wireless networking for easy data



sharing, storage and printing\*(optional)

- Up-to-date connectivity and data management solutions, wireless, LAN, integrated database\*(optional)
- Capability to send data to mobile by mail and blue tooth\*(optional)
- Total mobile medical solution for remote data transfer and diagnostic
- DICOM 3.0 compatibility\*(optional)
- 2USB ports
- 1 type-C port
- 6 TGC slides
- Average 4 multiple adjustable frequency in every probe and mode
- Up to 512 line density

## 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
- 15.6-inch high resolution flat panel display with up to 150 degree positioning adjustments
- Easy to carry by integrated handle
- Full integrated probe to reduce overall space
- Integrated touchable alphabetic keyboard
- Integrated capacity touch panel to easy and simplify workflow
- Cart support up to 200 mm up/down operation panel(optional)\*
- USB DVDRW (optional)\*

### 2.1 Keyboard

- Highly sensitive 8 inch capacity touch panel
- Intuitive, configurable and touchable interactive operation interface
- Ergonomic hard keys for general ultrasound operations
- 6 TGC slides, functionality at any depth
- Backlight keys
- Resolution: 1280\*800 pixels

### 2.2 Image display screen

- 15.6 inch high resolution IPS, LED technology, pixel resolution
- Big angle tilting capability
- Backlight adjustment



- Resolution: 1920\*1080 pixels

## 2.3 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

## 2.4 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

## 2.5 Bodymark

- More than 215 bodymarks for

versatile application

- User customizable

## 2.6 Peripherals

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

## 2.7 Dimensions and Weight

- Length: 387mm
- Width: 340mm
- Thickness: 53mm
- Weight: without accessories approx. 4.0kg

## 2.8 Electrical Power

- Voltage: 100-240V AC
- Frequency: 50/60Hz
- Power: Max.170VA

## 2.9 Operating Environment

- Ambient temperature:  
10-40° C
- Relative humidity: 30-75%
- Atmospheric pressure:  
700hPa-1060hPa



## 2.10 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 zoom

### S2-9C Broadband Curved Array

- Field of view: 66 degree
- Convex radius: 60mm
- Application: abdomen, ob/gyn, urology, pediatric
- B mode Frequency : 2.0-5.5MHz
- Har Frequency: Pen/Gen/Res
- Physical Footprint:  
79mm × 31mm
- Center frequency: 5.0 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

### X2-6C Broadband Curved Array

- Field of view: 65 degree
- Convex radius: 60mm
- Application: abdomen, ob/gyn, urology, pediatric
- B mode Frequency : 2.0-5.5MHz
- Har Frequency: Pen/Gen/Res
- Physical Footprint: 78mm × 28mm
- Center frequency: 4.0MHz
- Transducer elements:192



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

**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
- B mode Frequency range: 5.0-10.0 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

**X4-12L broadband linear array**

- Fine pitch, high resolution
- Applications: vascular, small parts
- Aperture size: 38.4mm
- B-mode Frequency range: 6.0 -12.0MHz
- Physical Footprint: 50.5mm × 17mm
- Center frequency: 7.8MHz
- Transducer element: 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
- B-mode Frequency range: 7.3 -14.0MHz
- Physical Footprint: 50.5mm × 20mm
- Center frequency: 10.5MHz
- Transducer element: 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
- B-mode Frequency range: 6.0 -12.0Mhz
- Physical Footprint: 65.5mm × 25.5mm
- Center frequency: 7.3MHz
- Transducer element: 256
- 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
- B-mode Frequency range: 2.0-3.5Mhz
- Physical Footprint: 34.5mm × 28.5mm
- Center frequency: 2.5MHz
- Transducer element: 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

### **S1-6P phased array**

- Single Crystal technology
- Applications: cardiac, abdomen
- Aperture size: 15.36mm
- Field of view: 90 degree
- Frequency range: 2.0-5.0Mhz
- Physical Footprint: 34.2mm x 28.7mm
- Center frequency: 3.2MHz
- Transducer elements:96
- Multi-imaging frequency setting in 2D, Harmonic, color Doppler and Wave

Doppler modes

- Reusable biopsy guide available

## **4. Advanced Imaging controls**

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### **4.1 VFusion**

- Available on all transducers and for 2D, 3D/4D
- 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**

- Special imaging processing to adapt to the speed of the ultrasound variation in different tissue
- Improved conspicuity of lesions, such as stone and tendon

### **4.4 Tissue Doppler (TD)**

- Present wall motion spectrum by



using Doppler principle

- Provide wall motion direction and velocity information

## 4.5 Tissue Velocity Imaging

### (TVI)(optional)\*

- 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

## 4.6 3D/4D

- 3D/4D rotation
- Grayscale imaging controls
- Selectable rendering approaches
- Unique high quality rendering algorithm
- Selectable gray maps
- Multi slide cutting
- Cinelooop 3D
- Review volume

### 4.6.1 HQ (optional)\*

- Amazing high image quality
- Extreme realistic rendering, images
- Similar operation as normal

rendering

### 4.6.2 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

### 4.6.3 3D Smart Face

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

### 4.6.4 Light Lab(Optional)

- Allowing user to customise the position and direction of the virtual light sources, which displays the internal structure details more clearly



and enhances the three-dimensional perception

- 3 types light available, there are Parallel light, Point light, Spotlight separately
- 8 presets available
- Fluid effect:  $\geq 11$ steps
- Brightness:  $\geq 21$ steps
- Move Light: Light1, Light2, Light3, Light All
- Light Color:  $\geq 50$ steps
- Distance:  $\geq 20$ steps
- Angle:  $\geq 0^\circ - 90^\circ$

## 4.7 Smart Operation

### 4.7.1 Free View

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

### 4.7.2 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

### 4.7.3 Magic Cut

- Ability to edit images, make

possible to cut away structure obstructing the view in the ROI

- Several cutting methods available

## 4.8 Smart 3D

### 4.8.1 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

### 4.8.2 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

## 4.9 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



#### 4.10 Multi-angle M mode(optional)

\*

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

#### 4.11 Stress Echo

- Stress echo is a non-invasive, dynamic evaluation of myocardial structure and its function under an external stress(exercise or pharmacology)
- 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

#### 4.12 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)

#### 4.13 Curved M mode

- Draw the route of the sample line freely and obtain the corresponding anatomical M-mode, This might be helpful to obtain myocardial wall motion.
- Color curved M mode is available.
- TVI & M mode is available.

### 5. Imaging modes

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#### 5.1 2D Imaging

- Pre-defined ATGC (adaptive temporal gain compensation) curves optimized for consistently excellent imaging
- B/M acoustic output: 10%-100%
- 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
- Display format: Single, Dual,





- Quad
- TGC: 6 slides on control pannel
  - SGC: 8 ponds on touch pannel(optional)
  - VFusion :  $\geq 7$ steps
  - VSpeckle:  $\geq 13$ 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: probe dependent
  - Gray filter:  $\geq 7$  steps
  - Persistence:  $\geq 8$ steps
  - Selectable image angles, probe dependent
  - Gain: 0-100%
  - Dynamic range: 30-320 db
  - VSharpen to enhance edge contrast:  $\geq 8$ steps
  - Smooth to improve spatial resolution:  $\geq 11$ steps
  - VNear to enhance SNR of near field, 4steps
  - Gray Map:  $\geq 32$ types
  - Tint Map:  $\geq 24$ types
  - TI heat index: TIB, TIS, TIC
  - Rotation:

- $0^\circ, 90^\circ, 180^\circ, 270^\circ$
- Zoom(up to  $10\times$ )

## 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,  $\geq 10$ steps
- Time marks: 0.025 – 0.5s
- Selectable display format prospective or retrospective ( V1/3, V1/2, V2/3, 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:  $\geq 7$ steps
- Dynamic range: 108db-128db, 2db/step
- Vsharpen:  $\geq 6$ steps



- Gray Map:  $\geq 32$ types
- Tint Map:  $\geq 24$ types
- 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
- Selectable in 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:  $\geq 4$ steps, depend on probes
- Baseline: 0-100%
- Acoustic power: 0-100%
- Line density:  $\geq 7$  steps
- Flash reduction:  $\geq 6$  steps
- Persistence:  $\geq 20$  steps
- Color Map:  $\geq 33$ types
- Smooth :  $\geq 7$ steps
- Sensitivity:  $\geq 6$  steps
- Transparency:  $\geq 6$ steps
- Color level:  $\geq 16$  steps
- Packet size:  $\geq 9$  steps

- Reverse function: on/off
- Color gain: 0-100%
- 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
- Individual controls for gain
- Selectable line density, flash reduction, persistence, maps, frequency, PRF, wall filter, packet size, color level, sensitivity, focus position, acoustic power, and smooth
- Color maps:  $\geq 24$  types
- Color levels:  $\geq 11$  steps
- Sensitivity:  $\geq 6$ steps
- Smooth:  $\geq 7$ steps
- Persistence:  $\geq 20$  steps
- 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

- Selectable gray filter, dynamic range, frequency, PRF, wall filter, baseline, angle correct, sample volume
- Selectable sweep speeds:  $\geq 10$  steps
- PW acoustic output: 5%-100%
- Gray filter:  $\geq 6$  steps
- Dynamic range: 108db-128db
- Baseline: 5%-95%
- Sample volume: 0.5mm-10mm
- Angle correct:  $-80^\circ \sim 80^\circ$
- Sensitivity:  $\geq 21$  steps
- Audio Volume: 0~20
- Spectrum Optimize:  $\geq 28$  steps
- Gray map:  $\geq 13$  types
- Tint map:  $\geq 11$  types
- Trace direction: above, below, both
- Trace type: max, mean, both
- Cardiac cycle: 1-5
- Selectable low frequency signal filtering with adjustable wall filter settings
- Selectable grayscale curve for optimal display
- Selectable chroma colorization maps
- Selectable display format prospective or retrospective (V1/3, V1/2, V2/3, H1/2, H3/4, full screen)
- Auto function to optimize spectral Doppler display
- 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
- Maximum velocity range: 19m/sec

## 5.8 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
- User can measure distance and area
- Measurement can be made on individual frames during cineloop review
- Available on linear transducers

## 5.9 Tview

- Expand view of scanning
- Available on linear transducers



## 5.10 Auto

- Intelligent one button automatic optimization in 2D and Doppler modes
- Automatically adjust PRF and baseline in Doppler

## 5.11 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:  $\geq 10$ steps
- Baseline: 5%-95%
- Angle correct:  $-80^\circ \sim 80^\circ$
- Sample volume: 0.5mm-10mm, 0.5mm/step
- Spectrum optimize:  $\geq 20$ steps
- Acoustic power: 5%-100%
- Dynamic range: 108db-128db
- Trace sensitive:  $\geq 21$ steps
- Gray filter:  $\geq 6$ steps
- Audio volume:  $\geq 21$ steps
- Mode: max, mean, both
- Direction: above, below, both
- Heart cycle: 1-5
- Gray map:  $\geq 13$  types
- Tint map:  $\geq 11$  types

## 5.12 Tissue Velocity Imaging (TVI)

(optional)\*

- 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:  $\geq 11$ steps
- Transparency:  $\geq 13$  steps
- Smooth:  $\geq 7$ steps
- Line density:  $\geq 3$ steps
- Persistence:  $\geq 7$ steps
- Color map:  $\geq 10$ types

## 5.13 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: 0%-100%
- Color level:  $\geq 11$  steps
- Transparency:  $\geq 13$  steps
- Packet size: 3,4,5,6
- Acoustic power: 5%-100%
- Display format: Single, Dual, Quad

## 5.14 Elastography imaging(EI)

(optional)\*

### 5.14.1 Elastic imaging(EI) (optional)

- 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
- Winspace: 0,1,2,3,4
- Overlap: 0,1,2,3,4
- Dynamic range: 0-10
- Sensitivity: 0,1
- Transparency:  $\geq 13$  steps
- Smooth:  $\geq 7$  steps
- Line density:  $\geq 7$  steps
- Persistence:  $\geq 20$  steps

- Map: EIO
- Display format: Single, Dual, Quad

### 5.14.2 VShear(ShearWave Elastography)(Optional)

- Available on linear transducers and convex probe
- A non-invasive method which can detect tissue hardness by calculating the shear wave propagation velocity and elastic modulus
- Persistence:  $\geq 7$  steps
- Smooth:  $\geq 7$  steps
- Transparency:  $\geq 6$  steps
- Scale:  $\geq 15$  steps
- Sync Display, simultaneously display 2D and shear wave elastography imaging in left and right respectively
- Vertical Display, simultaneously display 2D and shear wave elastography imaging in upper and down respectively
- Reliable Display, display the reliable area in shear wave elastography imaging
- Reliable Map, display the reliable area in 2D imaging
- Motion Stability, display motion stability in real time
- Measurement type(Kind): G, Cs, E
- Map: VShear0, VShear1
- Display format: Single, Dual, Quad



## 5.15 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
- Threshold: 256
- Transparency: 0.1-2, 0.1/step
- Category: Face, Spine, Brain, Heart, Hi speed, Lip&plate, Limbs, Custom
- Display format: single, double, triplex, 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: ≥ 8 types
- Tint maps: ≥ 24 Types
- Gray maps: ≥ 32 Types
- 2D VSpeckle: ≥ 3 types
- 3D VSpeckle: ≥ 3 types
- Render Type: Gray, GrayInv
- Inverse Available

- **MCUT**
- 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
- **Free view**
- Direction: left, right, up, down
- Route: curve, straight line
- Reference image: A, B, C
- Slice thickness: 0mm-20mm
- Active line: 1, 2, 3
- Mix: 10-90
- Threshold: 256 steps
- Transparency: 0.1-2.0, 0.1/step
- **Magic cut**
- Erase mode: inside lasso, outside lasso, big circle, small circle
- Erase type: trace, rectangle, ellipse
- Rotation direction: X, Y, Z
- **VOCAL**
- Vocal layers: 8, 12, 16, 20, 24, 28, 32
- Display format: single, Quad
- Image reference: A, B, C
- **Niche view**
- Model type: upper, lower



- Display format: single, quad
- Rotation direction: X, Y, Z
- Image reference: A, B, C, N

## 5.15 Contrast imaging(CBI)

### (Optional)

- Support contrast imaging in both 2D and 3D volume
- By contrast agent, imaging is enhanced within vessel which agent flow
- Have one button push to destroy the agent. Useful in the bubble wash-in characteristics of anatomy being scanned
- Sync Display, simultaneously display 2D and contrast bubble imaging in left and right respectively
- Vertical Display, simultaneously display 2D and contrast bubble imaging in uper and down respectively

## 6. Touch Panel Interface

### 6.1 2D mode

- New patient
- BodyPattern
- Archive
- Probe&APP
- Comments
- End exam
- Sys setting

- Report
- PView
- 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
- Elastosonography

### 6.2 M Mode

- New patient
- BodyPattern
- Archive
- Probe&APP
- Comments



- End exam
- Sys setting
- Report
- 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
- Probe&APP
- Comments
- End exam
- Sys setting
- Report
- Invert
- Full Screen
- L/R
- U/D
- Baseline
- Flash Reduction
- Line density
- Persistence
- Display format
- 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
- Probe&APP
- Comments
- End exam
- Sys setting
- Report
- Invert
- Triplex
- Display format
- Sweep speed
- Gray filter
- Dynamic range
- Trace sensitive
- Auto trace
- Mode/direction
- Maps
- Frequency
- PRF
- Wall filter
- Baseline
- Angle correct
- Sample volume



- Audio Volume
- Spectrum optimize
- Acoustic power

## 6.5 3D mode

- Comments
- BodyPattern
- Back to B
- Start3D
- ROI shape
- Render
- Display format
- Image reference
- View
- Gray map
- VSpeckle
- Quality
- Threshold
- Transparency
- Volume angle
- Movement step (after data acquisition)
- HQ Light(after data acquisition)
- Rotation angle (after data acquisition)
- Rotation direction (after data acquisition)

## 6.6 4D mode

- Comments
- Body Pattern
- Back to B
- Start 4D

- ROI shape
- Movement step
- Rotation direction
- Render
- Display format
- Image reference
- View
- Gray map
- VSpeckle
- Quality
- Threshold
- Transparency
- Volume angle

## 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 triplex
  - 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 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

- 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 Cineloop

- Acquisition, storage in memory and display of up to 1000 seconds long of 2D, color and PW/CW images for review

## 7.4 Compare

- Compare live imaging with stored imaging

Quick save feature

- The system provides quick save function through USB stick, internal/external HDD during or after exam

- Configurable saving file format, VRD



(VINNO Raw Data),  
DICOM, JPEG, BMP, PNG, MP4 and AVI

## 7.5 Physio

- One 3-lead ECG input\*(optional)
- Gain, sweep rate and display position controls
- Automatic heart rate calculation and display
- Fault condition display

## 7.6 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
- Export patient data into outside medias

## 7.7 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

## 7.8 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 (external HDD, USB stick)

- Network linkage
- Image export to network

### Storage servers

- DICOM export and retrieve \*(optional)
- Mobile data transfer solution by
  - Blue tooth\*(optional)
  - Email\*(optional)
  - Hot point connection
- VCloud \* (optional)
- DICOM workstation for remote diagnostic solution \*(optional)
- DICOM, JPEG, BMP, PNG, AVI
  - VRD and DICOM images stored in disc can be recalled on the VINNO system
    - JPEG, BMP, 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

## 7.9 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

## 7.10 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

Generic Measurement in CFM

mode

- CFV
  - point
  - profile

### 8.1.2 Generic Measurement in M

mode

- Depth
- Distance
- Time
- Slope
- Heart rate
- Stenosis
- A and B ratio
  - Diameter ratio
  - Time ratio
  - Velocity ratio

### 8.1.3 Generic 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
- Square meter 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 Pelvis
- 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

### 88.2.9 Auto NT (Nuchal Translucency

#### measurement)(Optional)\*

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

#### Auto IMT (Intima-Media Thickness) measurement

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

### 8.2.10 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

### 8.2.11 Auto IT (Intracranial translucency)

#### measurement(Optional) \*

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

### 8.2.12 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

### 8.2.13 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



### 8.2.14 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 added into the worksheet and report automatically

### 8.2.15 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

### 8.2.16 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 identify all the follicles with different colors and calculate follicle volume and diameter status, dedicated for women's reproductive health.
- Choose left or right follicle
- Automatically identify all the follicles with different colors and calculate follicle volume and diameter

### 8.2.17 VAid\_Breast (Optional)

VAid\_Breast is a tool for Breast lesion detection in real-time or on stored images (static & cine)

- For static image: Depicts boundaries of the Breast lesion and the size can be displayed
- For cine (real time scan or stored cine): The number and position of the Breast lesion can be indicated in real time.
- Available on all linear transducers for 2D

### 8.2.18 VAid\_Liver (Optional)

VAid\_Liver is a tool for Liver lesion detection in real-time or on stored images (static & cine)

- For static image: Depicts boundaries





of the Liver lesion and the size can be displayed

- For cine(real time scan or stored cine):The number and position of the Liver lesion can be indicated in real time.
- Available on all convex transducers for 2D

### 8.2.19 VAid\_Thyroid (Optional)

VAid\_Thyroid is a tool for Thyroid lesion detection in real-time or on stored images (static & cine)

- For static image: Depicts boundaries of the Thyroid lesion and the size can be displayed

- For cine(real time scan or stored cine):The number and position of the Thyroid lesion can be indicated in real time.

- Available on all linear transducers for 2D

### 8.2.19 Auto EF (Optional)

Auto EF is a tool for calculating the ejection fraction.

- Tracing the endocardium in apical four-chamber view and apical two-chamber view.
- The volume is calculated using Simpson's Method
- The biplane ejection fraction can be calculated.



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## 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.**

**You can contact us by phone and email (below) or contact our local representatives.**

📍 5F, A Building, NO.27 Xinfra Rd, Suzhou Industrial Park, 215123, China(215.6123)

☎ Tel: +86 512 62873806

☎ Fax: +86 512 62873801

✉ email address: [vinno@vinno.com](mailto:vinno@vinno.com)

🌐 website: [www.vinno.com](http://www.vinno.com)