Vetus 7

Veterinary Diagnostic Ultrasound System

Specification

Release: V1.0

Doppler: 01(01.00.00)

mindray
healthcare within reach

1 System Overview

1.1 Application

- Abdomen/General
- Reproduction
- Cardiology
- Small parts

1.2 Transducer types

- Curved array transducer
- Linear array transducer
- Phased array transducer
- Intra-cavity transducer

1.3 Imaging modes

- B-Mode
- THI and PSH™ (Phase Shift Harmonic Imaging)
- M-Mode/Color M-mode
- Free Xros M™ (Anatomical M-mode)
- Free Xros CM™ (Curved Anatomical M-mode)
- Color Doppler Imaging
- Power Doppler Imaging/Directional PDI
- Pulsed Wave Doppler
- Continuous Wave Doppler
- TDI
- Smart 3D™ (Freehand 3D)
- Natural Touch Elastography
- Stress Echo
- iScape™ View (Panoramic Imaging)

1.4 Standard features

- B-Mode
- THI and PSH™
- M-Mode
- Color M Mode
- Color Doppler Imaging
- Power Doppler Imaging and Directional PDI
- Pulsed Wave Doppler
- High Pulsed Repetition Frequency
- iBeam™ (Spatial Compound Imaging)
- iClear™ (Speckle Suppression Imaging)
- iTouch™ (Auto Image Optimization)
- Echo Boost™
- Zoom/iZoom (Full Screen Zoom)
- FCI (Frequency Compound Imaging)
- B steer
- ExFOV (Extended Field of View)
- HR Flow™ (High Resolution Flow)
- Raw data processing
- 4 active transducer sockets
- 1TB HDD hard drive
- 5 USB ports, 1 more dedicated USB port for printer
- Touch gestures
- iStation
- iStorage
- MedSight™
- MedTouch™

1.5 Optional features

- Continuous Wave Doppler
- ECG
- ECG Cable
- DC IN cable
- Free Xros M™
- Free Xros CM™
- iScape™ View
- Smart 3D™
- AutoEF
- TDI (Include TVI, TVD, TVM, TEI)
- TDI QA (TDI Quantitative Analysis)
- TT QA (Tissue Tracking Quantitative Analysis)
- Stress Echo
- DICOM
- Clinical Measurement Package
- iWorks™ (Auto Workflow Protocol)
- iNeedle™ (Needle Visualization Enhancement)
- Natural Touch Elastography
- Built-in battery
- Gel warmer
- Built-in DVD Recorder
- Built-in wireless adapter

1.6 Language support

- Software: English, Chinese, German, Spanish, French, Italian, Portuguese, Russian, Czech, Polish, Turkish, Norwegian, Serbian, Finnish, Danish, Icelandic, Swedish, Hungarian
- Keyboard input: English, Chinese,

German, Spanish, French, Italian, Portuguese, Russian, Czech, Polish Icelandic, Norwegian, Swedish, Finnish, Turkish, Danish, Hungarian, Serbian

- Control panel overlay: Chinese, Italian, Portuguese, Spanish, German, Russian, French, Czech, Polish
- User manual: English, Chinese

2 Physical Specification

2.1 Dimension and weight

- 21.5 inch monitor+lifting support arm
  - Depth: 850±5mm
  - Width (main unit): 510±5mm
  - Width (monitor): 533±5mm
  - Height: 1190±5mm
- Weight<85kg (including built-in battery; excluding peripherals and accessories)

2.2 Monitor

- 21.5-inch high resolution color LCD monitor
- Resolution: 1920*1080
- Viewing angle: 178° left/right; 178° up/down
- Digital on-screen display of brightness and contrast controls
- Independent tilt up of 110 degrees from horizontal, and swivel left/right of -90 to 90 degrees (Lifting support arm)
- Frame rate (Hz): 60Hz

2.3 Multi-directional articulating monitor arm for better user-friendly experience

Lifting support arm

- Rotate angle: 90 degrees to the left/right along with the support arm
- Up/Down: 150mm

2.4 Audio speakers

- Stereo audio speakers
- Audio data range: 130Hz~15kHz

2.5 Wheels

- Diameter: 125mm
- Castors (4): total lock and break

2.6 Probe port and holder

- Probe ports: 4 active ports
- Detachable probe holder: 6 as standard

2.7 Electrical power

- Voltage: 220-240V~
- Frequency: 50/60Hz
- Power consumption: Max. 630VA

2.8 Operating Environment

- Ambient temperature: 0-40°C
- Relative humidity: 30%-85% (no condensation)
- Atmospheric pressure: 700hPa-1060hPa

2.9 Storage & Transportation Environment

- Ambient temperature: -20-55°C
- Relative humidity: 20%-95% (no condensation)
- Atmospheric pressure: 700hPa-1060hPa

3 User Interface

3.1 Control panel

- User-centric control panel with home-based layout favors easy access to keys
- Backlit keys ensure accurate work in the dark room
- 6 Programmable keys available for user-defined functions (<P>,<F3-F6>,<F12>)
- 8-segment TGC control
- Full-sized, backlit QWERTY keyboard for text input, function keys and system programming
- Adjustable key volume and trackball speed meet different needs
- Dedicated palm rest design to help reduce user repetitive stress injury
- Independent rotation and up/down of control panel facilitates optimal positioning
  - rotate: 45 degrees (from center)
  - down/up: 140mm (pull 50mm range)

3.2 Touch screen

- 13.3-inch capacitive touch screen
- Resolution: 1920*1080
- Touch screen panel angle adjustable for easy visualization: 30 degrees in

rotation
- Digital brightness and contrast adjustment through preset
- Viewing angle: 170 degrees left/right; 170 degrees up/down
- Support touch screen gestures
- Support thin latex gloves on touch screen.

3.3 Support touch gestures

- Image mapping on touch screen: swipe down from the top edge to project image from monitor to touch screen. Swipe up from the bottom edge to remove projected image and show regular parameter interface.
- Page up and down: swipe horizontally on regular imaging parameter interface to change different pages; or swipe horizontally on projected images/cine loops to review them one by one
- Menu display: swipe from left edge to right to show the 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 image on touch screen
- 8 user defined gestures using two fingers for more functions, such as freeze, save, print, activate specific imaging modes, measurements, and some other special functions.

3.4 System boot-up (1TB HDD standard)

- Boot-up from complete shut-down in about <60 sec
- Shut-down in about <30 sec

3.5 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

3.6 Body marks

- More than 32 bodymarks for versatile application
- User customizable

3.7 Exam mode presets

- 32 system exam modes (unlimited number for user-defined ones)

3.8 Screen information*

- Common info:
  - Mindray logo
  - Hospital name
  - Exam date
  - Exam time
  - Acoustic power
  - Mechanical index
  - Tissue thermal index
  - ID, Last name, First Name, Middle initial, Animal type
  - Probe model
  - ECG icon (when ECG connected)
  - TGC Curve
  - Focus position
  - Thumbnail
  - Imaging parameters
  - Help guidance

*Not all items are listed in this part, detail info please refer to user manual

4 Imaging Parameters

4.1 Overview

- Echo-enriched Beamforming
- Up to 41472 channels
- 12-beamforming

4.2 B-mode

- Display formats: Single (B), Dual (B+B), Quad (4B)
- iClear™
- iBeam™: (All probes except for phased array probes)
- iTouch™
- Dual Live
- Image quality

- B steer
- ExFOV
- Depth
- Frame rate
- Acoustic output power
- TGC
- LGC
- Dynamic range
- Gain
- Focus number
- Focus position
- FOV
- Line density
- Persistence
- Horizontal Scale
- L/R flip and U/D flip
- Rotation
- TSI
- Gray Map
- Tint map
- Auto Merge
- Middle Line

4.3 THI and PSH

- Patent PSH™ technology, obtains purified harmonic, better contrast resolution, higher SNR, exceptional high frequency harmonic
- iClear™ available
- Image quality

4.4 M-mode

- Display formats
- Color M-mode available
- Dynamic range
- Gain
- M sweep speeds
- M soften
- Tint map
- Gray Map
- Edge enhance
- Time mark

4.5 Free Xros M™ (option)

- Display formats
- Color Free Xros M available
- Up to 3 lines
- Display all lines
- Sweep speeds
- M Tint map
- Gray Map

4.6 Free Xros CM™ (option)

- Only available in TDI mode
- Display formats
- Sweep speeds
- Tint map
- Gray Map

4.7 Color Doppler Imaging

- Dual live
- HR Flow™
- Image quality
- Steer
- Max frame rate
- Gain
- ROI size/position
- Scale
- Baseline
- Wall filter
- PRF
- Packet size
- Flow state
- Smooth
- B/C align
- Priority
- Color map
- Invert
- Auto invert
- Persistence
- Velocity tag
- Line density

4.8 Power Doppler Imaging

- Dual live
- HR Flow™
- Support directional power Doppler
- Image quality
- Steer
- Dynamic range
- Gain
- ROI size/position
- Wall filter
- PRF
- Packet size
- Flow state

- Smooth
- B/C align
- Priority
- Color map
- Invert
- Persistence
- Line density

4.9 PW/CW-Mode

- Display formats
- Duplex/Triplex
- Image quality
- Sample volume size
- Sample gate depth
- PW Scale
- CW Scale
- Baseline
- PW Steer
- Volume
- PW PRF
- CW PRF
- Gain
- Dynamic range
- Sweep speed
- Wall filter
- Invert
- Auto invert
- Angle correction
- Quick angle
- Gray map
- Tint map
- Time/frequency resolution
- Auto calc
- Auto calc cycle
- Auto Calc Parameter
- Trace Sensitivity
- Trace Smooth
- Trace area
- HPRF
- Time mark

4.10 TVI/TEI (Tissue Velocity/Energy Imaging, included in TDI option)

- Available on phased array transducer
- Dual live
- Max frame rate
- PRF
- Gain
- Dynamic range
- ROI size/position
- Scale
- Image quality
- Baseline
- Wall filter
- Packet size
- Tissue state:
- Smooth
- B/C align
- Priority
- TVI
- TEI
- Persistence
- Velocity tag
- Line density

4.11 TVD (Tissue Velocity Doppler, included in TDI option)

- Available on phased array transducer only
- Display formats
- Duplex/Triplex
- Image quality
- Sample volume size
- Sample gate depth
- Scale
- Baseline
- Volume
- PRF
- Gain
- Dynamic range
- Sweep speed
- Wall filter
- Invert
- Angle correction
- Quick angle
- Gray map
- Tint map
- Time/frequency resolution

4.12 TVM (Tissue Velocity Motion, included in TDI option)

- Available on phased array transducer only
- Display formats

- Image quality
- Gain
- M sweep speeds:
- Color maps
- Baseline
- Priority
- Tissue state
- Smooth
- Packet size
- Persistence
- Velocity tag
- Wall Filter
- Invert

4.13 Smart 3D™ (option)

- Smart 3D
  - Acquisition Method
  - Reset VOI
  - iClear
  - VR Refine
  - Acquisition mode
  - VR
  - MPR
  - Display formats
  - VOI
  - Reset
  - Active quadrant
  - VR orientation
  - Inversion
  - Accept VOI
  - Flip
  - Sync
  - Render modes
  - View direction
  - Threshold
  - Opacity
  - Smooth
  - Gray map
  - Brightness
  - Contrast
  - Tint
  - Depth VR
  - MagiClean
  - Thickness
  - Surface enhance
- Auto rotation
  - Rotation control
  - Speed
  - Direction
  - Position
  - Step:
- Edit:
  - Area selection
  - Undo
  - Eraser
  - Eraser Diameter

4.14 iScape™ View (option)

- Acquisition method
- Supports speed indicator
- Actual size
- Fit size
- Ruler
- Tint map
- Rotation

4.15 Stress Echo (option)

- Available on cardiac sector transducers
- 14 factory protocols
- User-defined protocols
- ECG triggered acquisition, display, selection, comparison, evaluation and archiving of multiple cardiac loops during various stages of a stress echo examination
- ASE 16 (with score 4-7), ASE 17 (with score 4-7)
- Customized stages
- View
- Image acquisition
  - R-wave trigger
  - Acquire mode
  - Ability to acquire frames or clips in B-mode, M-mode, Color, PW and TDI
- Image selection
  - Attach the images with view annotation label (PSLA, PSAX, A4C, A2C, and customized views)
- Review
  - Automatically adjust to the number of images user defined
- Wall Motion Scoring

- ASE 16 (with score 4-7), or ASE 17 (with score 4-7)
- Graphical display of scoring (Normal, Hyperkinetic, Severely Hyperkinetic, Akinetic, Dyskinetic)

- LV volume measurement
  - Measurement of LV Volume in all phases of cardiac cycle
- Report
  - Reporting for both Wall Motion Scoring and LV volume measurement

4.16 iBeam™

- Spatial compound imaging

4.17 iClear™

- Speckle suppression imaging
- Available for B, 3D

4.18 iTouch™

- Auto image optimization
- B-mode
- Color
- Power
- PW

4.19 Echo Boost™

- Only applicable for phased probes in cardiac exams
- improve the homogeneity of cardiac images through the whole field of view
- Better contrast resolution of myocardium tissue layers
- Better noise control in cardiac chambers and muscles

4.20 B steer

- Only for linear transducers

4.21 ExFOV

- Extended field of view
- Available for all convex and linear transducers

4.22 Zoom

- Zoom
- iZoom

4.23 QSave

- Quick save image parameter setting after image adjustment done
- Support Save, Create, Restore

4.24 AutoEF (option)

- Output EDV/ ESV/ EF/ SV/ CO by Simpson method
- Activated with or without ECG
- Adjustment for the border of endocardium by single point or multi points
- Adjust Frame
- Layout
- Diastole FR
- Systole FR
- Volume curve: on/off

4.25 TDI QA (option)

- Dedicated quantification tool for TDI speed, strain, strain rate analysis
- Ellipse ROI, Standard ROI
- Up to 8 of ROI
- Delete all
- Delete current
- ROI tracking: tracking ROI along with cardiac movement
- Smooth
- X scale
- Std.Height
- Std.Width
- Std.Angle
  Export

4.26 TT QA (option)

- Tissue tracking quantitative analysis
- Mandatory ECG connection before TT QA cine acquisition
- Six views for analysis
- Reload
- Edit
- Start tracking
- Accept & compute
- Display effec
- Trace method
- Bull's eye
- Valve's open and close time index
- Data export
- Cycle
- Auto play
- Thickness
- Track point
- Parameter

- Smooth

4.27 iNeedle™ (option)

- Only applicable for linear probes
- Needle visualization enhancement
- Needle steer
- Needle Steer

4.28 Natural Touch Elastography (option)

- The L13-3s and L12-4s probes in smart parts exam mode supports the Elastography.
- Support strain ratio measurement
- Unique shell analysis function
- Stress compensation technology reduces deeper tissue artifacts, obtains more uniform stress throughout whole field
- Stress indicator.
- Display format
- Map
- Smooth
- Invert
- Opacity
- ROI size/position
- Strain Scale

5 Cine Review and Raw Data Processing

5.1 Cine review

- Available in all modes
- Frame by frame manual cineloop review or auto playback with variable speed
- Maximum cine memory up to 13245 frames or 119s (M-mode)
- Retrospective (Max. time 120s) and prospective (Max. time 480s) storage are available and length is pre-settable
- Frame compare: displays one cine in dual format and allows frame by frame compare side by side
- Image/cine compare
- Jump to first and jump to last

5.2 Raw data processing

- B-mode:
  - TGC
  - Gain
  - Dyn Ra.
  - Gray Map
  - Tint Map
  - iClear
  - L/R Flip
  - U/D Flip
  - Rotation
  - iTouch
  - LGC
  - Dual Live
  - Auto Merge
  - H Scale
  - Echo Boost
- M-mode:
  - Gain
  - Speed
  - Dyn Ra.
  - Gray Map
  - Tint Map
  - Edge Enhance
  - Time Mark
- Color:
  - Gain
  - Baseline
  - Smooth
  - Color Map
  - Priority
  - Dual Live
  - Invert
  - Velocity tag
- PW:
  - Gain
  - Baseline
  - Volume
  - Angle
  - Speed
  - Dyn Ra.
  - Gray Map
  - Tint Map
  - Invert
  - WF

- Quick Angle
- Auto Calculate
- T/F Res
- Auto Calc Cycle
- Auto Calc Parameter
- Trace Sensitivity
- Trace Smooth
- Trace Area
- Time Mark

6 Measurement/Analysis and Report*

6.1 General measurements

- B-Mode
  - Distance
  - Ellipse
  - Trace
  - Spline
  - Cross
  - Angle
  - Double Dist
  - Trace Len
  - Trace Len(Spline)
  - Parallel
  - IMT
  - B-Profile
  - B-Hist(Ellipse)
  - B-Hist(Trace)
  - B-Hist(Spline)
  - B-Hist(Rectangle)
  - Depth
  - Color Vel
  - Strain Hist
  - Color Vel Profile
  - ----------
  - Volume
  - Volume(Ellipse)
  - Volume(E+Dist.)
  - Ratio(D)
  - ----------
  - Volume
  - Volume
  - Volume(Ellipse)
  - Volume(E+Dist.)
  - Ratio(A)
  - Area1
  - Area2
  - Strain Ratio
  - A
  - B
  - Volume Flow
  - Vas Area
  - TAMEAN
  - TAMAX
  -
- M-Mode
  - HR
  - HR(R-R)
  - Slope
  - Distance
  - Time
  - Velocity
  -
- D-Mode
  - PS/ED
  - Vel
  - HR
  - HR(R-R)
  - Time
  - Acceleration
  - D Trace
  - ----------
  - Ratio(Vel)
  - Ratio(VTI)
  - ----------
  - Volume Flow
  - Vas Area
  - TAMEAN
  - TAMAX
- Automatic Doppler Spectrum Analysis
  - Heart cycle pre-settable (1, 2, 3, 4, 5)
  - Automatic real-time and retrospective tracing
  - User configurable display of items
  - Support PI, RI, TAMAX, TAMEAN, Volume Flow calculations

- Appropriate factory setting according to applications

6.2 Clinical option measurement package

- Abdomen

B-Mode

- Liver
- Renal L
- Renal H
- Renal W
- Cortex
- Adrenal L
- Adrenal H
- Adrenal W
- CBD
- Portal V Diam
- CHD
- GB L
- GB H
- GB wall th
- Panc duct
- Panc head
- Panc body
- Panc tail
- Spleen L
- Spleen H
- Spleen W
- Spleen Area
- Splenic A Diam
- Splenic V Diam
- Aorta Diam H
- Aorta Diam W
- Aorta Bif
- Aorta Aneurysm L
- Aorta Aneurysm W
- Aorta Aneurysm H
- Iliac Diam
- Pre-BL L
- Pre-BL H
- Pre-BL W
- Post-BL L
- Post-BL H
- Post-BL W
- Ureter
- Hepatic Lesion1 d1
- Hepatic Lesion1 d2
- Hepatic Lesion1 d3
- Hepatic Lesion2 d1
- Hepatic Lesion2 d2
- Hepatic Lesion2 d3
- Hepatic Lesion3 d1
- Hepatic Lesion3 d2
- Hepatic Lesion3 d3
- Hepatic Cyst1 d1
- Hepatic Cyst1 d2
- Hepatic Cyst1 d3
- Hepatic Cyst2 d1
- Hepatic Cyst2 d2
- Hepatic Cyst2 d3
- Hepatic Cyst3 d1
- Hepatic Cyst3 d2
- Hepatic Cyst3 d3
- Renal Cyst1 d1
- Renal Cyst1 d2
- Renal Cyst1 d3
- Renal Cyst2 d1
- Renal Cyst2 d2
- Renal Cyst2 d3
- Renal Cyst3 d1
- Renal Cyst3 d2
- Renal Cyst3 d3
- Renal Lesion1 d1
- Renal Lesion1 d2
- Renal Lesion1 d3
- Renal Lesion2 d1
- Renal Lesion2 d2
- Renal Lesion2 d3
- Renal Lesion3 d1
- Renal Lesion3 d2
- Renal Lesion3 d3
- Prostate L
- Prostate H
- Prostate W
- Seminal L
- Seminal H
- Seminal W
- ----------
- Aorta Sten D
- Aorta Sten A

- Renal Vol
- Prostate Vol
- Pre-BL Vol
- Post-BL Vol
- Mictur.Vol
- ----------
- Spleen
- Spleen L
- Spleen H
- Spleen W
- Spleen Area
- Aorta Aneurysm
- Aorta Aneurysm L
- Aorta Aneurysm W
- Aorta Aneurysm H
- Hepatic Lesion1
- Hepatic Lesion1 d1
- Hepatic Lesion1 d2
- Hepatic Lesion1 d3
- Hepatic Lesion2
- Hepatic Lesion2 d1
- Hepatic Lesion2 d2
- Hepatic Lesion2 d3
- Hepatic Lesion3
- Hepatic Lesion3 d1
- Hepatic Lesion3 d2
- Hepatic Lesion3 d3
- Hepatic Cyst1
- Hepatic Cyst1 d1
- Hepatic Cyst1 d2
- Hepatic Cyst1 d3
- Hepatic Cyst2
- Hepatic Cyst2 d1
- Hepatic Cyst2 d2
- Hepatic Cyst2 d3
- Hepatic Cyst3
- Hepatic Cyst3 d1
- Hepatic Cyst3 d2
- Hepatic Cyst3 d3
- Kidney
- Renal L
- Renal H
- Renal W
- Cortex
- Renal Cyst1
- Renal Cyst1 d1
- Renal Cyst1 d2
- Renal Cyst1 d3
- Renal Cyst2
- Renal Cyst2 d1
- Renal Cyst2 d2
- Renal Cyst2 d3
- Renal Cyst3
- Renal Cyst3 d1
- Renal Cyst3 d2
- Renal Cyst3 d3
- Renal Lesion1
- Renal Lesion1 d1
- Renal Lesion1 d2
- Renal Lesion1 d3
- Renal Lesion2
- Renal Lesion2 d1
- Renal Lesion2 d2
- Renal Lesion2 d3
- Renal Lesion3
- Renal Lesion3 d1
- Renal Lesion3 d2
- Renal Lesion3 d3
- Adrenal
- Adrenal L
- Adrenal H
- Adrenal W
- Bladder
- Pre-BL L
- Pre-BL H
- Pre-BL W
- Post-BL L
- Post-BL H
- Post-BL W
- Prostate
- Prostate L
- Prostate H
- Prostate W
- Seminal Vesicle
- Seminal L
- Seminal H
- Seminal W
-

M-Mode
-
D-Mode
- Ren A Org
- Arcuate A
- Segment A
- Interlobar A
- Renal A
- M Renal A
- Renal V
- Aorta
- Celiac Axis
- SMA
- IMA
- C Hepatic A
- Hepatic A
- Splenic A
- IVC
- IVC Reflux
- Portal V
- M Portal V
- Hepatic V
- Lt Hepatic V
- Rt Hepatic V
- M Hepatic V
- Splenic V
- SMV
- IMV
- ----------
- RAR
- SMA/Ao
- CA/Ao

- Reproduction

B-Mode
- Dog CRL
- Dog GS
- Dog HD
- Dog BD
- Feline BD
- Feline HD
- Equine GS-H
- Equine GS-V
- Bovine CRL
- Bovine TD
- Bovine HD
- Ovine CRL
- Ovine BPD
-

M-Mode
-

D-Mode

- Cardiology

B-Mode
- RVAWd(2D)
- RVAWs(2D)
- RVDd(2D)
- RVDs(2D)
- IVSd(2D)
- IVSs(2D)
- LVIDd(2D)
- LVIDs(2D)
- LVPWd(2D)
- LVPWs(2D)
- Diastole(2D)
- Systole(2D)
- LVLd apical
- LVLs apical
- LVAd apical
- LVAs apical
- LVAd sax MV
- LVAs sax MV
- LVAd sax Endo
- LVAd sax Epi
- LV Major
- LV Minor
- LV Area(d)
- LV Area(s)
- HR(2D)
- RA Major
- RA Minor
- RA Area
- RA Vol(A4C)
- RAP
- RV Area(d)
- RV Area(s)
- RV Major
- RV Minor
- LA Diam(2D)

- LA Major
- LA Minor
- LA Area
- LVOT Diam
- Ao Diam(2D)
- ACS(2D)
- AV Diam
- Ao Isthmus(2D)
- Ao Sinus Diam(2D)
- Ao st junct(2D)
- AVA
- Ao Arch Diam(2D)
- Ao Asc Diam(2D)
- Ao Desc Diam(2D)
- Duct Art Diam
- Post Ductal
- Pre Ductal
- MCS(2D)
- MV Diam
- MV EPSS(2D)
- MVA
- TV Diam
- TVA
- PV Diam
- RVOT Diam
- MPA Diam(2D)
- RPA Diam(2D)
- LPA Diam(2D)
- IVC Diam(Expir)
- IVC Diam(Insp)
- SVC Diam(Expir)
- SVC Diam(Insp)
- LCA Diam
- RCA Diam
- PEd(2D)
- PEs(2D)
- VSD Diam
- ASD Diam
- PDA Diam
- PFO Diam
- AutoEF
- ----------
- LA/Ao(2D)
- ----------

- LV(2D)
- Diastole(2D)
- Systole(2D)
- IVSd(2D)
- LVIDd(2D)
- LVPWd(2D)
- IVSs(2D)
- LVIDs(2D)
- LVPWs(2D)
- HR(2D)
- Simpson
- A2Cd
- A2Cs
- A4Cd
- A4Cs
- HR(2D)
- Mod.Simpson
- LVLd apical
- LVLs apical
- LVAd sax MV
- LVAs sax MV
- LVAd sax PM
- LVAs sax PM
- HR(2D)
- S-P Ellipse
- LVLd apical
- LVAd apical
- LVLs apical
- LVAs apical
- HR(2D)
- B-P Ellipse
- LVIDd(2D)
- LVAd sax MV
- LVIDs(2D)
- LVAs sax MV
- LVAd apical
- LVAs apical
- HR(2D)
- Bullet
- LVLd apical
- LVLs apical
- LVAd sax MV
- LVAs sax MV
- HR(2D)

- LV Mass(Cube-2D)
- IVSd(2D)
- LVIDd(2D)
- LVPWd(2D)
- LV Mass(A-L)
- LVLd apical
- LVAd sax Epi
- LVAd sax Endo
- LV Mass(T-E)
- LVAd sax Epi
- LVAd sax Endo
- a
- d
- LA Vol(Simp)
- LA Vol(A2C)
- LA Vol(A4C)
- LA Vol(A-L)
- LA apical
- LAA(A2C)
- LAA(A4C)
- MVA(VTI)
- LVOT Diam
- LVOT VTI
- MV VTI
- AVA(VTI)
- LVOT Diam
- LVOT VTI
- AV VTI
- CO(LVOT)
- LVOT Diam
- LVOT VTI
- AV HR
- CO(RVOT)
- RVOT Diam
- RVOT VTI
- PV HR
- CO(MV)
- MV Diam
- MV VTI
- MV HR
- CO(TV)
- TV Diam
- TV VTI
- TV HR
- PISA MR
- MR Rad
- MR Als Vel
- MR VTI
- PISA AR
- AR Rad
- AR Als Vel
- AR VTI
- PISA TR
- TR Rad
- TR Als Vel
- TR VTI
- PISA PR
- PR Rad
- PR Als Vel
- PR VTI
- Qp/Qs
- LVOT Diam
- LVOT VTI
- RVOT Diam
- RVOT VTI
-

M-Mode

- RVAWd(M)
- RVAWs(M)
- RVDd(M)
- RVDs(M)
- Ao Arch Diam(M)
- Ao Asc Diam(M)
- Ao Desc Diam(M)
- Ao Diam(M)
- Ao Isthmus(M)
- Ao Sinus Diam(M)
- Ao st junct(M)
- ACS(M)
- HR(M)
- IVSd(M)
- IVSs(M)
- LA Diam(M)
- LPA Diam(M)
- Diastole(M)
- Systole(M)
- LVET(M)
- LVIDd(M)

- LVIDs(M)
- LVOT Diam
- LVPEP(M)
- LVPWd(M)
- LVPWs(M)
- MCS(M)
- MPA Diam(M)
- MV A Amp
- MV E Amp
- MV D-E Slope
- MV D-E Amp
- MV E-F Slope
- MV EPSS(M)
- PEd(M)
- PEs(M)
- RPA Diam(M)
- RVET(M)
- RVOT Diam
- RVPEP(M)
- MAPSE
- TAPSE
- MV ALL
- ----------
- LA/Ao(M)
- ----------
- LV(M)
- Diastole(M)
- Systole(M)
- IVSd(M)
- LVIDd(M)
- LVPWd(M)
- IVSs(M)
- LVIDs(M)
- LVPWs(M)
- HR(M)
- LV Mass(Cube-M)
- IVSd(M)
- LVIDd(M)
- LVPWd(M)
- LV Tei Index(M)
- MV C-O dur(M)
- LVET(M)
-

D-Mode

- MV Aa(lateral)
- MV Aa(medial)
- AAo Vmax
- AV VTI
- AV HR
- AV Vmax
- AR DecT
- AR PHT
- AR Ved
- AR Vmax
- AR VTI
- MV ARa(lateral)
- MV ARa(medial)
- ASD Vmax
- AV AccT
- AV DecT
- Coarc Post-Duct
- Coarc Pre-Duct
- DAo Vmax
- MV DRa(lateral)
- MV DRa(medial)
- MV Ea(lateral)
- MV Ea(medial)
- IVC Vel(Expir)
- IVC Vel(Insp)
- IVCT
- LPA Vmax
- LVET(Doppler)
- LVOT AccT
- LVOT VTI
- LVOT Vmax
- LVPEP(Doppler)
- MPA Vmax
- dP/dt
- MR VTI
- MR Vmax
- MS Vmax
- MV A Dur
- MV A Vel
- MV A VTI
- MV AccT
- MV DecT
- MV E Dur
- MV E Vel

- MV E VTI
- IVRT
- MV VTI
- MV HR
- MV Vmax
- PVein A Dur
- PVein A Vel
- PVein D Vel
- PVein D VTI
- PVein DecT
- PVein S Vel
- PVein S VTI
- PDA Vel(d)
- PDA Vel(s)
- PR PHT
- PR VTI
- PR Ved
- PR Vmax
- PV AccT
- PV VTI
- PV HR
- PV Vmax
- RAP
- RPA Vmax
- RVET(Doppler)
- RVOT Vmax
- RVOT VTI
- RVPEP(Doppler)
- MV Sa(lateral)
- MV Sa(medial)
- SVC Vel(Expir)
- SVC Vel(Insp)
- TR VTI
- TR Vmax
- TV A Dur
- TV A Vel
- TV AccT
- TV DecT
- TV E Vel
- TV VTI
- TV HR
- TV Vmax
- VSD Vmax
- Hepatic V S Vel
- Hepatic V D Vel
- ----------
- MV E/A
- MVA(PHT)
- TV E/A
- TVA(PHT)
- ----------
- LV Tei Index(Doppler)
- MV C-O dur(Doppler)
- LVET(Doppler)
- RVSP
- TR Vmax
- RAP
- PAEDP
- PR Ved
- RAP
- MVA(VTI)
- LVOT Diam
- LVOT VTI
- MV VTI
- AVA(VTI)
- LVOT Diam
- LVOT VTI
- AV VTI
- CO(LVOT)
- LVOT Diam
- LVOT VTI
- AV HR
- CO(RVOT)
- RVOT Diam
- RVOT VTI
- PV HR
- CO(MV)
- MV Diam
- MV VTI
- MV HR
- CO(TV)
- TV Diam
- TV VTI
- TV HR
- RV Tei Index
- TV C-O dur
- RVET(Doppler)
- PISA MR

- MR Rad
- MR Als Vel
- MR VTI
- PISA AR
- AR Rad
- AR Als Vel
- AR VTI
- PISA TR
- TR Rad
- TR Als Vel
- TR VTI
- PISA PR
- PR Rad
- PR Als Vel
- PR VTI
- Qp/Qs
- LVOT Diam
- LVOT VTI
- RVOT Diam
- RVOT VTI

- Small Parts

B-Mode

- Thyroid L
- Thyroid H
- Thyroid W
- Isthmus H
- Thyroid Mass1 d1
- Thyroid Mass1 d2
- Thyroid Mass1 d3
- Thyroid Mass2 d1
- Thyroid Mass2 d2
- Thyroid Mass2 d3
- Thyroid Mass3 d1
- Thyroid Mass3 d2
- Thyroid Mass3 d3
- Thyroid Nodule1 d1
- Thyroid Nodule1 d2
- Thyroid Nodule1 d3
- Thyroid Nodule2 d1
- Thyroid Nodule2 d2
- Thyroid Nodule2 d3
- Thyroid Nodule3 d1
- Thyroid Nodule3 d2
- Thyroid Nodule3 d3
- Thyroid Cyst1 d1
- Thyroid Cyst1 d2
- Thyroid Cyst1 d3
- Thyroid Cyst2 d1
- Thyroid Cyst2 d2
- Thyroid Cyst2 d3
- Thyroid Cyst3 d1
- Thyroid Cyst3 d2
- Thyroid Cyst3 d3
- Testicular L
- Testicular H
- Testicular W
- Epididymis L
- Epididymis H
- Epididymis W
- Scrotal Wall
- Testicular Mass1 d1
- Testicular Mass1 d2
- Testicular Mass1 d3
- Testicular Mass2 d1
- Testicular Mass2 d2
- Testicular Mass2 d3
- Testicular Mass3 d1
- Testicular Mass3 d2
- Testicular Mass3 d3
- Breast Mass1 L
- Breast Mass1 H
- Breast Mass1 W
- Nip.-Mass1 Dist.
- Skin-Mass1 Dist.
- Breast Mass2 L
- Breast Mass2 H
- Breast Mass2 W
- Nip.-Mass2 Dist.
- Skin-Mass2 Dist.
- Breast Mass3 L
- Breast Mass3 H
- Breast Mass3 W
- Nip.-Mass3 Dist.
- Skin-Mass3 Dist.
- Breast Mass4 L
- Breast Mass4 H
- Breast Mass4 W
- Nip.-Mass4 Dist.

- Skin-Mass4 Dist.
- Breast Mass5 L
- Breast Mass5 H
- Breast Mass5 W
- Nip.-Mass5 Dist.
- Skin-Mass5 Dist.
- Breast Mass6 L
- Breast Mass6 H
- Breast Mass6 W
- Nip.-Mass6 Dist.
- Skin-Mass6 Dist.
- Breast Mass7 L
- Breast Mass7 H
- Breast Mass7 W
- Nip.-Mass7 Dist.
- Skin-Mass7 Dist.
- Breast Mass8 L
- Breast Mass8 H
- Breast Mass8 W
- Nip.-Mass8 Dist.
- Skin-Mass8 Dist.
- Breast Mass9 L
- Breast Mass9 H
- Breast Mass9 W
- Nip.-Mass9 Dist.
- Skin-Mass9 Dist.
- Breast Mass10 L
- Breast Mass10 H
- Breast Mass10 W
- Nip.-Mass10 Dist.
- Skin-Mass10 Dist.
- ----------
- Thyroid Vol
- Testicular Vol
- ----------
- Thyroid
- Thyroid L
- Thyroid H
- Thyroid W
- Thyroid Mass1
- Thyroid Mass1 d1
- Thyroid Mass1 d2
- Thyroid Mass1 d3
- Thyroid Mass2
- Thyroid Mass2 d1
- Thyroid Mass2 d2
- Thyroid Mass2 d3
- Thyroid Mass3
- Thyroid Mass3 d1
- Thyroid Mass3 d2
- Thyroid Mass3 d3
- Thyroid Nodule1
- Thyroid Nodule1 d1
- Thyroid Nodule1 d2
- Thyroid Nodule1 d3
- Thyroid Nodule2
- Thyroid Nodule2 d1
- Thyroid Nodule2 d2
- Thyroid Nodule2 d3
- Thyroid Nodule3
- Thyroid Nodule3 d1
- Thyroid Nodule3 d2
- Thyroid Nodule3 d3
- Thyroid Cyst1
- Thyroid Cyst1 d1
- Thyroid Cyst1 d2
- Thyroid Cyst1 d3
- Thyroid Cyst2
- Thyroid Cyst2 d1
- Thyroid Cyst2 d2
- Thyroid Cyst2 d3
- Thyroid Cyst3
- Thyroid Cyst3 d1
- Thyroid Cyst3 d2
- Thyroid Cyst3 d3
- Testis
- Testicular L
- Testicular H
- Testicular W
- Testicular Mass1
- Testicular Mass1 d1
- Testicular Mass1 d2
- Testicular Mass1 d3
- Testicular Mass2
- Testicular Mass2 d1
- Testicular Mass2 d2
- Testicular Mass2 d3
- Testicular Mass3

- Testicular Mass3 d1
- Testicular Mass3 d2
- Testicular Mass3 d3
- Epididymis
- Epididymis L
- Epididymis H
- Epididymis W
- Breast Mass1
- Breast Mass1 L
- Breast Mass1 H
- Breast Mass1 W
- Nip.-Mass1 Dist.
- Skin-Mass1 Dist.
- Breast Mass2
- Breast Mass2 L
- Breast Mass2 H
- Breast Mass2 W
- Nip.-Mass2 Dist.
- Skin-Mass2 Dist.
- Breast Mass3
- Breast Mass3 L
- Breast Mass3 H
- Breast Mass3 W
- Nip.-Mass3 Dist.
- Skin-Mass3 Dist.
- Breast Mass4
- Breast Mass4 L
- Breast Mass4 H
- Breast Mass4 W
- Nip.-Mass4 Dist.
- Skin-Mass4 Dist.
- Breast Mass5
- Breast Mass5 L
- Breast Mass5 H
- Breast Mass5 W
- Nip.-Mass5 Dist.
- Skin-Mass5 Dist.
- Breast Mass6
- Breast Mass6 L
- Breast Mass6 H
- Breast Mass6 W
- Nip.-Mass6 Dist.
- Skin-Mass6 Dist.
- Breast Mass7
- Breast Mass7 L
- Breast Mass7 H
- Breast Mass7 W
- Nip.-Mass7 Dist.
- Skin-Mass7 Dist.
- Breast Mass8
- Breast Mass8 L
- Breast Mass8 H
- Breast Mass8 W
- Nip.-Mass8 Dist.
- Skin-Mass8 Dist.
- Breast Mass9
- Breast Mass9 L
- Breast Mass9 H
- Breast Mass9 W
- Nip.-Mass9 Dist.
- Skin-Mass9 Dist.
- Breast Mass10
- Breast Mass10 L
- Breast Mass10 H
- Breast Mass10 W
- Nip.-Mass10 Dist.
- Skin-Mass10 Dist.
-

M-Mode

-

D-Mode

- STA
- ITA
- Testis A
- Testis V
- Epididymis A
- Epididymis V

6.3 Report

- Specific report template by application
- User-defined report template
- Editable value in report
- Images selectable
- Able to export as PDF/RTF file

* Not all measurements are listed in this part; For more detailed information, please refer to User Manual

7 Exam Storage and Management

7.1 Exam storage

- 1TB HDD hard drive. More than 835 GB internal hard drive for animal data storage
- Direct digital storage of single frame and cine 2D, color and Doppler.

7.2 Exam management

- iStation™ workstation dedicated for animal exam management
- Animal exam query/retrieve
- Support review of current and past exam
- New exam, Active exam, Continue exam functions, End exam are available
- Support measurements and calculations on archived exam and images
- Export images as (BMP/JPG/TIFF/DCM/AVI/MP4 format)
- Support backup/send to USB devices, DVD-RW media

7.3 iWorks™ (option)

- Auto workflow protocol
- Templates are user configurable
- Functions
- iWorks setup mode
- iWorks setup annotation
- iWorks setup bodymark
- iWorks setup measurement
- Template import and export are available

8 Connectivity

8.1 Ethernet Network Connection

- Cable connection
- Wireless connection: built-in wireless adaptor

8.2 DICOM 3.0

- DICOM basic (option)
  - Verify (SCU, SCP)
  - Task management
  - Print
  - Storage
  - Storage Commitment
  - Media Storage (including DICOM DIR)
- DICOM Worklist (option, HL7 supported)
- DICOM Query/Retrieve (option)
- DICOM Modality Performed Procedure Step - MPPS (option)

8.3 iStorage™ (included in UltraAssist)

- Direct network storage tool between ultrasound system and personal computer

8.4 MedSight™

- An interactive app that lets you transfer clinical images straight from Mindray Ultrasound system to a smart device, such as mobile phone or tablet PC.
- Needs to be installed on mobile terminal
- Transfer images or clips from system to mobile terminal through WiFi
- Support Android and IOS powered smart devices
- Android 4.0 or above; IOS 7.0 or above
- DICOM not necessary

8.5 MedTouch™

- Connect Ultrasound machine to smart devices based on Android and IOS system, such as tablet PC or mobile phone. Remote control of Ultrasound machine, and review of animal information on smart devices.
- Support Android and IOS powered smart devices
- Android 4.0 or above; IOS 7.0 or above
- DICOM not necessary

9 Transducers

9.1 Curved array

- C11-3s

- Application: Abdomen (Canine, Feline), Cardiology (Canine, Feline), Reproduction (Canine, Feline), Small Parts (Canine, Feline)
- Bandwidth: 2.6-12.8MHz
- Convex Radius: 15mm
- Footprint: 27.4mm x 8.4mm
- Biopsy Guide: NGB-018, multi angle, reusable

• 6C2s

- Application: Abdomen (Canine, Feline), Cardiology (Canine, Feline), Reproduction (Canine, Feline), Small Parts (Canine, Feline)
- Bandwidth: 2.6~12.8MHz
- Convex Radius: 15mm
- Footprint: 29mm × 10mm
- Biopsy Guide: NGB-005, multi angle, reusable

• C6-2s

- Application: Abdomen (Canine), Reproduction (Canine, Equine, Bovine, Ovine)
- Bandwidth: 1.3~5.7MHz
- Convex Radius: 60mm
- Biopsy Guide: NGB-022, multi angle, reusable

9.2 Linear array

• L13-3s

- Application: Abdomen (Canine , Feline), Small Parts (Canine, Feline)
- Bandwidth: 4.4~13.5MHz
- Field of View (max): 38mm
- Footprint: 44.2mm × 8.5mm
- Biopsy Guide: NGB-007, multi angle, reusable

• L12-4s

- Application: Abdomen (Canine , Feline), Small Parts (Canine, Feline)
- Bandwidth: 4.4-13.5MHz
- Field of View (max): 38mm
- Footprint: 44.2mm × 8.5mm
- Biopsy Guide: NGB-007, multi angle, reusable

• 7L4Bs

- Application: Abdomen (Canine , Feline), Small Parts (Canine, Feline)
- Bandwidth: 3.6-13.5MHz
- Field of View (max): 38mm
- Footprint: 45.7mm x 10.9mm
- Biopsy Guide: NGB-007, multi angle, reusable

• 6LE5Vs

- Application: Reproduction (Equine, Bovine, Ovine)
- Bandwidth: 3.6-13.5MHz
- Field of View (max): 47.6mm
- Footprint: 52mm x 11mm
- Biopsy Guide: not available

9.3 Phased array

• P8-2s

- Application: Cardiology (Canine, Feline), Abdomen (Canine, Feline)
- Bandwidth : 2.3-7.2MHz
- Field of View (max): 90°
- Footprint: 19.5mm x 11mm
- Biopsy Guide: not available

• P10-4s

- Application: Cardiology (Canine, Feline), Abdomen (Canine, Feline)
- Bandwidth : 3.0-11.4MHz
- Field of View (max): 90°
- Footprint: 15mm ×9.1mm
- Biopsy Guide: not available

• P4-2s

- Application: Cardiology (Canine, Equine, Bovine, Ovine)
- Bandwidth: 1.3-4.6MHz
- Field of View (max): 90°
- Footprint: 23.4mm × 15.2mm
- Biopsy Guide: NGB-011, multi angle, reusable

10 Peripheral Devices and Accessories (Option)

10.1 Black/white video printer

- MITSUBISHI P95DW-N, SONY UP-D898MD, SONY UP-X898MD, MITSUBISHI P93W-Z

10.2 Color digital printer

- SONY UP-D25MD

10.3 Graph/text printer

- HP OFFICEJET PRO 8100

10.4 Gel warmer

- Easily be disassembled off system for cleaning
- Temperature: 37°C, 40°C, off
- Light indicator for temperature protecting
- Light indicator:
  Green--- working normally;
  Flickering orange---working abnormally

10.5 Footswitch

- USB port: 971-SWNOM (2-pedal)
- USB port: 971-SWNOM (3-pedal)
- FS-81-SP-2 (1-pedal)
- Support User-definable functions (Freeze, Save, Print)

10.6 ECG

- 6-pin, AHA/IEC, for 3-lead wires
- ECG wave display: on/off
- Gain: 0-30, 1/step
- Sweep speed: 1-6, 1/step

10.7 Barcode reader

- Laser barcode scanner
- Model: SYMBOL LS2208, DS4308

10.8 Built-in Wireless adapter

- Encryption: WEP, WPA-PSK, WPA2-PSK
- Max transfer speed: 300Mbps
- Protocols: 802.11b: 11,5.5,2,1 Mbps; 802.11g: 54,48,36,24,18,12,9,6 Mbps; 802.11n: up to 300Mbps

10.9 Built-in Battery

- Replaceable and rechargeable lithium battery
- Restore from standby mode: less than 7s
- Full battery lasts more than 24h in standby mode
- Light indicator for standby mode
- Empty battery recharged to full in less than 4h
- Li-ion 14.8V 3000mAh LI24I001A 04A9009
- 14.8V * 3Ah < 100Wh

11 System Inputs and Outputs

11.1 Video/Audio input

- Microphone: 1 port

11.2 Video/Audio output

- S-Video out: 1 port, PAL/NTSC
- HDMI: 1 Port
- VGA out: 1 port
- Audio out: 2 port

11.3 Physio input

- Support ECG signal
- ECG: 1 port
- PCG: 1 port (reserved)

11.4 Other input/output

- USB: 5 USB ports, 1 more dedicated USB port for printer
- Ethernet: 1 port

12 Safety and Conformance

12.1 Quality standards

- ISO 9001

12.2 Design standards

- EN 60601-1 and IEC 60601-1
- EN 60601-1-2 and IEC 60601-1-2
- EN 60601-2-37 and IEC60601-2-37
- EN ISO 17664 and ISO 17664

12.3 CE declaration

The device is fully in conformance with the low voltage directive 2014/35/EU and the EMC directive 2014/30/EU

NOTICE:

Not all features or specifications described in this document may be available in all probes and/or modes.

Mindray reserves the right to make changes in specifications and features shown herein, or discontinue the product at any time without notice or obligation. Contact Mindray Representative for the most current information