

Vetus 5

Veterinary Diagnostic Ultrasound System

Datasheet

Release V01.00.00



1 System Overview

1.1 Application

- Abdomen
- Reproduction
- Cardiology
- Small parts

1.2 Transducer types

- Curved array transducer
- Linear array transducer
- Phased array 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
- iScape™ View (Panoramic Imaging)
- UWN (Ultra Wideband Non-linear Contrast 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
- iBeam™ (Spatial Compound Imaging)
- iClear™ (Speckle Suppression Imaging)
- iTouch™ (Auto Image Optimization)
- Zoom/iZoom (Full Screen Zoom)
- FCI (Frequency Compound Imaging)
- B steer
- ExFOV (Extended Field of View)

- Raw data processing
- 4 probe ports
- 1TB hard drive
- 7 USB ports
- iStorage
- MedSight
- Smart Installment Reminder

1.5 Optional features

- iScape™ View
- UWN Contrast Imaging™
- Natural Touch Elastography
- Continuous Wave Doppler
- ECG
- Free Xros M™
- Free Xros CM™
- TDI (Include TVI, TVD, TVM, TEI)
- TDI QA (TDI Quantitative Analysis)
- Smart 3D™
- DICOM
- Clinical Measurement Package
- Smart Bladder
- iNeedle
- Built-in battery
- Gel warmer
- Built-in wireless adapter
- DVD R/W driver
- Barcode reader
- Network accessory package

1.6 Language support

- Software: English, Chinese, German, Spanish, French, Italian, Portuguese, Russian, Czech, Polish, Turkish, Norwegian, Finnish, Danish, Icelandic, Swedish, Serbian
- Keyboard input: English, Chinese, German, Spanish, French, Italian, Portuguese, Russian, Czech, Polish, Icelandic, Norwegian, Swedish, Finnish, Turkish, Danish, Serbian
- Control panel overlay: German, French, Russian, Italian, Spanish, Portuguese, Czech, Polish
- User manual: English, Chinese

2 Physical Specification



2.1 Dimension and weight

- Fixed support arm: 810mm (Depth) x 543mm (Width) x 1131mm (Height)
- Weight:
<75 Kg (standard configuration without probes)

2.2 Monitor

- High resolution color LED monitor
Independent tilt up of 110 degrees from horizontal and swivel left/right of -90 to 90 degrees
- Frame rate (Hz): 60Hz
- Digital on-screen display of brightness and contrast controls
- Viewing angle: 89° left/right; 89° up/down
- Resolution: 1920x1080 (21.5 inch)

2.3 Wheels

- Diameter: 100 mm
- Castors (4): total lock and break

2.4 Probe port and holder

- Probe ports: 4 ports
- Detachable probe holder: 6

2.5 Electrical power

- Voltage: 100-240V~
- Frequency: 50/60 Hz
- Power consumption: Max. 600VA

2.6 Operating Environment

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

2.7 Storage & Transportation Environment

- Ambient temperature: -20-55 °C
- Relative humidity: 30%-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>, <F9>)
- 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±3 degrees (from center)
 - down/up: 145±15 mm (pull 55 mm range)

3.2 Touch screen

- 13.3-inch LED 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: 85 degrees left/right; 85 degrees up/down
- Support thin latex gloves on touch screen.

3.3 System boot-up

- Boot-up from complete shut-down in less than 60 sec
- Shut-down in less than 30 sec

3.4 Comments

- Supports text input and arrow
- Adjustable text size and arrow size
- Supports home position
- Covers various application
- User customizable

3.5 Body marks

- More than 30 bodymarks for versatile application
- User customizable

3.6 Exam mode presets

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

3.7 Screen information*

- Common info:
 - Mindray logo
 - Hospital name
 - Exam date
 - Exam time
 - Acoustic power
 - Mechanical index
 - ID, Name, Gender, Age
 - Probe model
 - ECG icon (when ECG connected),
 - Operator
 - 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 27648 channels
- 12-beamforming

4.2 B-mode

- Display formats: Single(B), Dual(B+B), Quad(4B)
- iClear™: Off; 4 steps
- iBeam™: Off/On
- iTouch™
- iTouch Brightness: -12~12
- FCI
- Frequency (dependent on probe)
- B steer: available on linear transducers, 3 levels
- ExFOV: available on convex and linear transducers
- Depth: 30 levels (0.9-38.8 cm; all dependent on transducers)
- Frame rate (max): 1400 f/s
- Acoustic output power: 32 levels
- TGC: 8 pods on control panel

- LGC: 8 segments on touch screen
- Dynamic range: 30-240, 5/step
- Gain: 0-100
- Focus number: 1-4 (dependent on transducer)
- Focus position: 16 levels
- FOV: continuously adjustable
- Line density: L, M, H, UH
- Persistence: 0~7, 1/step
- Horizontal Scale: on/off
- L/R flip and U/D flip: on/off
- Rotation: 0, 90, 180, 270
- TSI: general/muscle/fluid/fat
- Gray Map: 25 types
- Tint map: off; 25 types
- Auto merge: on/off
- Middle Line: on/off

4.3 THI and PSH™

- Patent PSH™ technology, obtains purer harmonic, better contrast resolution, higher SNR, exceptional high frequency harmonic
- iClear™ available
- Frequency: depends on probe

4.4 M-mode

- Display formats: V2:3, V3:2, H2:3, V3:1, FULL (V: vertical, H: horizontal)
- Color M-mode available
- Acoustic output power: 32 levels
- Dynamic range: 30-240, 5/step
- Gain: 0-100
- M sweep speeds: 6 levels;
- M soften: 0~14, 1/step
- Tint map: off; 25 types
- Gray Map: 25 types
- Edge enhance: 0~3, 1/step

4.5 Free Xros M™

- Display formats: same as M mode
- Color Free Xros M available
- Up to 3 lines
- Display all lines
- Sweep speeds: 6 levels
- M Tint map: off; 25 types
- Gray Map: 25 types

4.6 Free Xros CM™

- Only available in TDI mode
- Display formats: same as M mode
- Sweep speeds: 6 levels
- Tint map: off; 25 types
- Gray Map: 25 types
- Edit, undo, delete function for curved line

4.7 Color Doppler Imaging

- Dual live
- Frequency
- Steer: max. 20 degrees (linear transducer)
- Max frame rate: 1249 f/s
- Acoustic output power: 32 levels
- Gain: 0-100
- ROI size/position: adjustable
- Scale: 30 steps, 5 cm/s to 100 cm/s
- Baseline: -8-8, 1/step
- Wall filter: 0-7, 1/step
- PRF: 0.3 kHz to 15.5 kHz
- Packet size: 0-3, 1/step
- Smooth: 0-4, 1/step
- B/C align: on/off
- Priority: 0-100%, 10%/step
- Color map: 21 types
- Invert: on/off
- Persistence: 0-4, 1/step
- Velocity tag: on/off
- Line density: L, M, H, UH

4.8 Power Doppler Imaging

- Dual live
- Support directional power Doppler
- Acoustic output power: 32 levels
- Dynamic range: 10-70, 5/step
- Gain: 0-100
- ROI size/position: adjustable
- Scale: 30 steps
- Wall filter: 0-7, 1/step
- PRF: max. 15.5 kHz
- Packet size: 0-3, 1/step
- Smooth: 0-4, 1/step
- B/C align
- Priority: 0-100%, 10%/step

- Power map: 4 types
- Directional color map: 4 types
- Persistence: 0-4, 1/step
- Line density: L, M, H, UH

4.9 PW/CW-Mode

- Display formats: V2:3, V3:2, H2:3, V3:1, FULL (V: vertical, H: horizontal)
 - Duplex/Triplex (PW only)
 - Sample volume size: 0.5-20 mm (PW only)
 - Sample gate depth: adjustable
 - PW Scale: 30 steps, 4.7 cm/s to 924 cm/s
 - CW Scale: 30 steps, 3.1 cm/s to 6160 cm/s
 - Baseline: -4-4, 1/step
 - PW Steer: max. 20 degrees (linear transducer)
 - Volume: 0-100%, 2%/step
 - PW PRF: 0.7 kHz to 24 kHz
 - CW PRF: 0.4 kHz to 160 kHz
 - Gain: 0-100
 - Dynamic range: 24-72, 2/step
 - Sweep speed: 6 steps
 - Wall filter: 0-6, 1/step
 - Invert: on/off
 - Angle correction: -89-89 degrees, 1/step
 - Quick angle: -60, 0, 60 degrees
 - Gray map: 25 types
 - Tint map: Off; 25 types
 - Time/frequency resolution: 0-4, 1/step
 - Auto calc: on/off (PW only)
 - Auto calc cycle: 1-5 (PW only)
 - Trace area: above, below, all (PW only)
 - iTouch (PW only)
 - HPRF (PW only)
- #### 4.10 TVI/TEI (Tissue Velocity/Energy Imaging, included in TDI option)
- Available on phased array transducer
 - Dual live: side by side displays B and B+TVI
 - Max frame rate: 1697 f/s
 - PRF: 0.4 kHz to 9.9 kHz

- Acoustic output power: 32 levels
- Gain: 0-100
- Dynamic range: 10-70, 5/step (TEI only)
- ROI size/position: adjustable
- Scale: 30 steps, 5 cm/s to 100 cm/s (TVI only)
- Baseline: -8-8, 1/step (TVI only)
- Wall filter: 0-7, 1/step
- Packet size: 0-3, 1/step
- Smooth: 0-4, 1/step
- B/C align
- Priority: 0-100%, 10%/step
- TVI maps: 10 types
- TEI maps: 8 types
- Invert: on/off (TVI only)
- Persistence: 0-4, 1/step
- Velocity tag (TVI only): on/off
- Line density: L, M, H, UH

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

- Available on phased array transducer only
- Display formats: V2:3, V3:2, H2:3, V3:1, FULL (V: vertical, H: horizontal)
- Sample volume size: 0.5-20 mm
- Sample gate depth: adjustable
- Scale: 30 steps, 4.7 cm/s – 739.2 cm/s
- Baseline: -4-4, 1/step
- Volume: 0-100%, 2%/step
- PRF: 0.7 kHz to 24 kHz
- Gain: 0-100
- Dynamic range: 24-72, 2/step
- Sweep speed: 6 steps
- Wall filter: 0-6, 1/step
- Invert
- Angle correction: -89-89 degrees, 1/step
- Quick angle: -60, 0, 60 degrees
- Gray map: 25 types
- Tint map: Off; 25 types
- Time/frequency resolution: 0-4, 1/step

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

- Available on phased array transducer only

- Display formats: V2:3, V3:2, H2:3, V3:1, FULL (V: vertical, H: horizontal)
- Dynamic range: 30-240, 5/step
- Gain: 0-100
- M sweep speeds: 6 levels
- M soften: 0-14, 1/step
- Gray Map: 25 types
- Tint Map: off, 25 types
- Edge enhancement: 0-3, 1/step

4.13 TDI QA

- Dedicated quantification tool for TDI velocity analysis
- Up to 8 of ROI
- Delete all
- Delete current
- ROI tracking: tracking ROI along with cardiac movement
- Std.Height: 1.5-50 mm
- Std.Width: 1.5-50 mm
- Std.Angle: -89-90 degrees
- Export: export current data as CSV format file

4.14 Smart 3D™

- Smart 3D
 - Acquisition Method: Rocked, Linear
 - iClear
 - VR: on/off, select volume rendered image
 - MPR: on/off, select A, B and C plane
 - Display formats: MPR only /asymmetric
 - VOI: on/off
 - Reset: all, orientation, reset curve
 - Active quadrant: A, B, C, VR
 - VR orientation: 0, 90, 180, 270
 - Inversion: on/off
 - Accept VOI: on/off
 - Flip: flip VR
 - Sync: synchronize VR with selected plane
 - Render modes: Surface, Min, Max, X-ray
 - View direction: down/up, left/right, front/back

- Threshold: 0-100%, 1/step (only on VR)
- Opacity: 0-100%, 5%/step (only on VR)
- Smooth: 0-10, 1/step
- Brightness: 0-100%, 2%/step
- Contrast: 0-100%, 2%/step
- Tint: off; 25 types
- Auto rotation
 - Rotation control: play, single loop, loop
 - Direction: left/right, up/down
- Edit:
 - Area selection: inside polygon, outside polygon, inside contour, outside contour, inside rect, outside rect
 - Undo: undo, undo all

4.15 iScape™ View

- Acquisition method: B and Power
- Supports velocity indicator
- Actual size: on/off
- Fit size: on/off
- Ruler: on/off
- Tint map: off; 25 types
- Rotation: 0-355 degrees, 5/step

4.16 Elastography

- Available on 7L4B、L12-3E、L13-3
- Stress compensation technology reduces deeper tissue artifacts, obtains more uniform stress throughout whole field
- Stress indicator: supports frame by frame stress indication
- Display format: Dual live, Single E
- Elasto Map: 6 types
- Smooth: 0-5
- Invert: on/off
- Opacity: 6 steps

4.17 UWN Contrast Imaging™*

- Ultra Wideband Non-linear (UWN) contrast imaging technology, which provides exceptional contrast agent detecting capability, not only extracts second harmonic, but also non-linear

fundamental signals

- Available on C6-2
- Supports Low MI contrast imaging
- Timer1: on/off
- Timer2: on/off
- Pro capture: captures prospective image less than 480s
- Retro capture: captures retrospective image less than 120s
- Dual live: side by side displays tissue image and contrast image
- Destruct: instantly destroy contrast bubbles
- iClear: off; 4 steps
- Mix: mix contrast image with tissue image
- Mix map: 7 types, available when Mix mode is active
- Persistence: 8 steps
- Dynamic range: 30-240, 5/step
- Gray map: 25 types; inactive when Mix mode is in use
- Tint map: off; 25 types
- Supports U/D Flip and L/R Flip
- Rotation: 90 degrees/step
- HImgPos: transpose position of contrast and tissue image
- Line density: L/M/H/UH
- DestructAP: 32 levels
- Destruct time: 500-2000 ms

4.18 iBeam™

- Spatial compound imaging
- 7 angles maximum
- Available on all convex and linear transducers

4.19 iClear™

- Speckle suppression imaging
- Available for B, 3D

4.20 iTouch™

- Auto image optimization
- B-mode: gain, TGC
- Color: gain
- Power: gain
- PW: baseline, scale, PRF, WF

4.21 B steer

- Only for linear transducers

4.22 ExFov

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

4.23 Zoom

- Zoom: Spot zoom (write zoom) up to 10x, Pan zoom (read zoom) 0.8-10
- iZoom: convertible 3 steps; normal image, zoom standard area, zoom only image area

4.24 QSave

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

4.25 iNeedle

- Needle visualization enhancement
- Needle steer angle adjustable
- B/iNeedle: on/off

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 12394 frames or 181.1 s (M-mode)/169.6s (PW-mode)
- Retrospective and prospective storage are available and length is pre-settable (Max. time 480 s, Max. frames: 191976)
- Frame compare: displays one cine in dual format and allows frame by frame compare side by side
- Image/cine compare: max 4 for 2D/Color/Power/TDI files compare; max 2 for M/PW/TVD/TVM files compare (compare cines which are saved in same animal file)
- Jump to first and jump to last: one keystroke go to first or last frame in the

cine

5.2 Raw data processing

- B-mode:
 - TGC
 - Gain
 - Gray Map
 - Tint Map
 - iClear
 - L/R Flip
 - U/D Flip
 - Rotation
 - LGC
 - Auto Merge
 - H Scale
- M-mode:
 - Gray Map
 - Tint Map
- Color:
 - Baseline
 - Smooth
 - Color Map
 - Priority
 - Dual Live
 - Invert
 - Velocity tag
- PW:
 - Gain
 - Baseline
 - Volume
 - Angle
 - Dyn Ra.
 - Gray Map
 - Tint Map
 - Invert
 - Quick Angle
 - Auto Calculate
 - Auto Calc Cycle
 - Auto Calc Parameter
 - Trace Area

6 Measurement/Analysis and

Report*

6.1 Generic measurements

B-mode
 B-Mode
 Distance
 Ellipse
 Trace
 Spline
 Cross
 Angle
 Double Dist
 Trace Len
 Trace Len(Spline)
 Parallel
 B-Profile
 B-Hist(Ellipse)
 B-Hist(Trace)
 B-Hist(Spline)
 B-Hist(Rectangle)
 Depth
 Color Vel
 Color Vel Profile

 Volume
 Volume(Ellipse)
 Volume(E+Dist.)
 Ratio(D)
 Ratio(Ellipse)
 Ratio(Spline)
 Ratio(Cross)

 Volume
 Volume
 Volume(Ellipse)
 Volume(E+Dist.)
 Ratio(A)
 Ratio(Trace)
 Ratio(Ellipse)
 Ratio(Spline)
 Ratio(Cross)

Volume Flow
 Vas Area
 TAMEAN
 TAMAX

M-Mode
 HR

Slope
 Distance
 Time
 Velocity
 D-Mode
 PS/ED
 Vel
 HR
 Time
 Acceleration
 D Trace

 Volume Flow
 Vas Area
 TAMEAN
 TAMAX

6.2 Application measurement package

- Abdominal
 - 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
 - Aorta Diam
 - Aorta Bif
 - Iliac Diam
 - Pre-BL L
 - Pre-BL H

Pre-BL W	Splenic A
Post-BL L	IVC
Post-BL H	Portal V
Post-BL W	M Portal V
Ureter	Hepatic V
-----	Lt Hepatic V
Renal Vol	Rt Hepatic V
Pre-BL Vol	M Hepatic V
Post-BL Vol	Splenic V
Mictur.Vol	SMV
-----	• Reproduction
Kidney	B-Mode
Renal L	Dog CRL
Renal H	Dog GS
Renal W	Dog HD
Cortex	Dog BD
Bladder	Feline BD
Pre-BL L	Feline HD
Pre-BL H	Equine GS-H
Pre-BL W	Equine GS-V
Post-BL L	Bovine CRL
Post-BL H	Bovine TD
Post-BL W	Bovine HD
Adrenal	Ovine CRL
Adrenal L	Ovine BPD
Adrenal H	• Cardiology
Adrenal W	B-Mode
Smart Bladder	LA Diam(2D)
XS Bladder	LA Major
Sag Bladder	LA Minor
	RA Major
D-Mode	RA Minor
Ren A Org	LV Major
Arcuate A	LV Minor
Segment A	RV Major
Interlobar A	RV Minor
Renal A	LA Area
M Renal A	RA Area
Renal V	LV Area(d)
Aorta	LV Area(s)
Celiac Axis	RV Area(d)
SMA	RV Area(s)
C Hepatic A	LVIDd(2D)
Hepatic A	LVIDs(2D)

LVIDd(Teich-2D)
 LVIDs(Teich-2D)
 LVIDd(Cube-2D)
 LVIDs(Cube-2D)
 LVIDd(Gibson-2D)
 LVIDs(Gibson-2D)
 RVDd(2D)
 RVDs(2D)
 LVPWd(2D)
 LVPWs(2D)
 RVAWd(2D)
 RVAWs(2D)
 IVSd(2D)
 IVSs(2D)
 Ao Diam(2D)
 Ao Arch Diam(2D)
 Ao Asc Diam(2D)
 Ao Desc Diam(2D)
 Ao Isthmus(2D)
 Ao st junct(2D)
 Ao Sinus Diam(2D)
 Duct Art Diam
 Pre Ductal
 Post Ductal
 ACS(2D)
 LVOT Diam(2D)
 AV Diam
 AVA
 PV Diam
 LPA Diam(2D)
 RPA Diam(2D)
 MPA Diam(2D)
 RVOT Diam(2D)
 MV Diam
 MVA
 MCS(2D)
 MV EPSS(2D)
 TV Diam
 TVA
 IVC Diam(Insp)
 IVC Diam(Expir)
 SVC Diam(Insp)
 SVC Diam(Expir)
 LCA Diam

RCA Diam
 VSD Diam
 ASD Diam
 PDA Diam
 PFO Diam
 PEd(2D)
 PEs(2D)
 Diastole(Teich-2D)
 Systole(Teich-2D)
 Diastole(Cube-2D)
 Systole(Cube-2D)
 Diastole(Gibson-2D)
 Systole(Gibson-2D)
 HR(Teich 2D)
 HR(Cube 2D)
 HR(Gibson 2D)

 LA/Ao(2D)
 Ao/LA(2D)

 CO(RVOT)
 RVOT Diam(2D)
 RVOT VTI
 PV HR
 S-P Ellipse
 LVLd apical(SP Ellipse)
 LVAd apical(SP Ellipse)
 LVLS apical(SP Ellipse)
 LVAs apical(SP Ellipse)
 HR(SP Ellipse)
 B-P Ellipse
 LVIDd(BP Ellipse)
 LVIDs(BP Ellipse)
 LVAd sax MV(BP Ellipse)
 LVAs sax MV(BP Ellipse)
 LVAd apical(BP Ellipse)
 LVAs apical(BP Ellipse)
 HR(BP Ellipse)
 Bullet
 LVLd apical(Bullet)
 LVLS apical(Bullet)
 LVAd sax MV(Bullet)
 LVAs sax MV(Bullet)
 HR(Bullet)

Mod.Simpson	Systole(Gibson-2D)
LVLd apical(Simp)	IVSd(Gibson-2D)
LVLs apical(Simp)	LVIDd(Gibson-2D)
LVAd sax MV(Simp)	LVPWd(Gibson-2D)
LVAs sax MV(Simp)	IVSs(Gibson-2D)
LVAd sax PM(Simp)	LVIDs(Gibson-2D)
LVAs sax PM(Simp)	LVPWs(Gibson-2D)
HR(Mod Simp)	HR(Gibson 2D)
Simp SP(A2C)	LA Vol(A-L)
EDV(Simp SP-A2C)	LA Diam(LA Vol A-L)
ESV(Simp SP-A2C)	LAA(A2C)
HR(Simp SP A2C)	LAA(A4C)
Simp SP(A4C)	LA Vol(Simp)
EDV(Simp SP-A4C)	LA Vol(A2C)
ESV(Simp SP-A4C)	LA Vol(A4C)
HR(Simp SP A4C)	RA Vol(Simp)
Simpson BP	RA Vol(A4C)
EDV(Simp BP-A2C)	LV Mass(Cube-2D)
ESV(Simp BP-A2C)	IVSd(LV Mass Cube-2D)
EDV(Simp BP-A4C)	LVIDd(LV Mass Cube-2D)
ESV(Simp BP-A4C)	LVPWd(LV Mass Cube-2D)
HR(Simp BP)	LV Mass(T-E)
Cube(2D)	LVAd sax Epi(LV Mass T-E)
Diastole(Cube-2D)	LVAd sax Endo(LV Mass T-E)
Systole(Cube-2D)	a
IVSd(Cube-2D)	d
LVIDd(Cube-2D)	LV Mass(A-L)
LVPWd(Cube-2D)	LVAd sax Epi(LV Mass A-L)
IVSs(Cube-2D)	LVAd sax Endo(LV Mass A-L)
LVIDs(Cube-2D)	LVLd apical(LV Mass A-L)
LVPWs(Cube-2D)	MVA(VTI)
HR(Cube 2D)	LVOT Diam(MVA VTI)
Teichholz(2D)	LVOT VTI(MVA VTI)
Diastole(Teich-2D)	MV VTI(MVA VTI)
Systole(Teich-2D)	AVA(VTI)
IVSd(Teich-2D)	LVOT Diam(AVA VTI)
LVIDd(Teich-2D)	LVOT VTI(AVA VTI)
LVPWd(Teich-2D)	AV VTI(AVA VTI)
IVSs(Teich-2D)	Qp/Qs
LVIDs(Teich-2D)	AV Diam(Qp/Qs)
LVPWs(Teich-2D)	AV VTI(Qp/Qs)
HR(Teich 2D)	AV HR(Qp/Qs)
Gibson(2D)	PV Diam(Qp/Qs)
Diastole(Gibson-2D)	PV VTI(Qp/Qs)

PV HR(Qp/Qs)	ACS(M)
PISA MR	LPA Diam(M)
MR Rad	RPA Diam(M)
MR Als Vel	MPA Diam(M)
MR VTI(PISA MR)	RVOT Diam(M)
PISA AR	MV E Amp
AR Rad	MV A Amp
AR Als Vel	MV E-F Slope
AR VTI(PISA AR)	MV D-E Slope
PISA TR	MV DE
TR Rad	MCS(M)
TR Als Vel	MV EPSS(M)
TR VTI(PISA TR)	PEd(M)
PISA PR	PEs(M)
PR Rad	LVPEP(M)
PR Als Vel	LVET(M)
PR VTI(PISA PR)	RVPEP(M)
	RVET(M)
M-Mode	Diastole(Teich-M)
LA Diam(M)	Systole(Teich-M)
LVIDd(M)	Diastole(Cube-M)
LVIDs(M)	Systole(Cube-M)
LVIDd(Teich-M)	Diastole(Gibson-M)
LVIDs(Teich-M)	Systole(Gibson-M)
LVIDd(Cube-M)	HR(Teich M)
LVIDs(Cube-M)	HR(Cube M)
LVIDd(Gibson-M)	HR(Gibson M)
LVIDs(Gibson-M)	HR
RVDd(M)	TAPSE
RVDs(M)	-----
LVPWd(M)	LA/Ao(M)
LVPWs(M)	Ao/LA(M)
RVAWd(M)	-----
RVAWs(M)	LV Tei Index(M)
IVSd(M)	MV C-O dur(M)
IVSs(M)	LVET(LV Tei Index-M)
Ao Diam(M)	Cube(M)
Ao Arch Diam(M)	Diastole(Cube-M)
Ao Asc Diam(M)	Systole(Cube-M)
Ao Desc Diam(M)	IVSd(Cube-M)
Ao Isthmus(M)	LVIDd(Cube-M)
Ao st junct(M)	LVPWd(Cube-M)
Ao Sinus Diam(M)	IVSs(Cube-M)
LVOT Diam(M)	LVIDs(Cube-M)

LVPWs(Cube-M)	LVOT AccT
HR(Cube M)	AAo Vmax
Teichholz(M)	DAo Vmax
Diastole(Teich-M)	AV Vmax
Systole(Teich-M)	AV VTI
IVSd(Teich-M)	AV HR
LVIDd(Teich-M)	LVPEP(Doppler)
LVPWd(Teich-M)	LVET(Doppler)
IVSs(Teich-M)	AV AccT
LVIDs(Teich-M)	AV DecT
LVPWs(Teich-M)	RVET(Doppler)
HR(Teich M)	RVPEP(Doppler)
Gibson(M)	TV Vmax
Diastole(Gibson-M)	TV E Vel
Systole(Gibson-M)	TV A Vel
IVSd(Gibson-M)	TV VTI
LVIDd(Gibson-M)	TV HR
LVPWd(Gibson-M)	TV AccT
IVSs(Gibson-M)	TV DecT
LVIDs(Gibson-M)	TV A Dur
LVPWs(Gibson-M)	RVOT Vmax
HR(Gibson M)	RVOT VTI
LV Mass(Cube-M)	RVOT HR
IVSd(LV Mass Cube-M)	PV Vmax
LVIDd(LV Mass Cube-M)	PV VTI
LVPWd(LV Mass Cube-M)	PV HR
D-Mode	PV AccT
MV Vmax	MPA Vmax
MV E Vel	RPA Vmax
MV A Vel	LPA Vmax
MV E VTI	PVein S Vel
MV A VTI	PVein D Vel
MV VTI	PVein A Vel
MV HR	PVein A Dur
MV AccT	PVein S VTI
MV DecT	PVein D VTI
IVRT	PVein DecT
IVCT	IVC Vel(Insp)
MV E Dur	IVC Vel(Expir)
MV A Dur	SVC Vel(Insp)
LVOT Vmax	SVC Vel(Expir)
LVOT VTI	MR Vmax
LVOT HR	MR VTI
	MS Vmax

dP/dt
 AR Vmax
 AR VTI
 AR DecT
 AR PHT
 AR Ved
 TR Vmax
 TR Vmax(RVSP)
 TR VTI
 PR Vmax
 PR VTI
 PR PHT
 PR Ved
 RAP
 VSD Vmax
 ASD Vmax
 PDA Vel(d)
 PDA Vel(s)
 Coarc Pre-Duct
 Coarc Post-Duct
 Ea(medial)
 Aa(medial)
 ARa(medial)
 DRa(medial)
 Sa(medial)
 Ea(lateral)
 Aa(lateral)
 ARa(lateral)
 DRa(lateral)
 Sa(lateral)
 HR
 Hepatic V S Vel
 Hepatic V D Vel

 MV E/A
 MVA(PHT)
 TV E/A
 TVA(PHT)

 CO(RVOT)
 RVOT Diam(2D)
 RVOT VTI
 PV HR
 MVA(VTI)

LVOT Diam(MVA VTI)
 LVOT VTI(MVA VTI)
 MV VTI(MVA VTI)
 AVA(VTI)
 LVOT Diam(AVA VTI)
 LVOT VTI(AVA VTI)
 AV VTI(AVA VTI)
 LV Tei Index(Doppler)
 MV C-O dur(Doppler)
 LVET(LV Tei Index-Doppler)
 RVSP
 TR Vmax(RVSP)
 RAP
 PAEDP
 PR Ved(PAEDP)
 RAP
 RV Tei Index
 TV C-O dur
 RVET(RV Tei Index)
 Qp/Qs
 AV Diam(Qp/Qs)
 AV VTI(Qp/Qs)
 AV HR(Qp/Qs)
 PV Diam(Qp/Qs)
 PV VTI(Qp/Qs)
 PV HR(Qp/Qs)
 PISA MR
 MR Rad
 MR Als Vel
 MR VTI(PISA MR)
 PISA AR
 AR Rad
 AR Als Vel
 AR VTI(PISA AR)
 PISA TR
 TR Rad
 TR Als Vel
 TR VTI(PISA TR)
 PISA PR
 PR Rad
 PR Als Vel
 PR VTI(PISA PR)

- Small Parts
B-Mode

Thyroid L
Thyroid H
Thyroid W
Isthmus H
Testicular L
Testicular H
Testicular W
Breast Mass1 d1
Breast Mass1 d2
Breast Mass1 d3
Breast Mass2 d1
Breast Mass2 d2
Breast Mass2 d3
Breast Mass3 d1
Breast Mass3 d2
Breast Mass3 d3
Breast Mass4 d1
Breast Mass4 d2
Breast Mass4 d3
Breast Mass5 d1
Breast Mass5 d2
Breast Mass5 d3
Breast Mass6 d1
Breast Mass6 d2
Breast Mass6 d3
Breast Mass7 d1
Breast Mass7 d2
Breast Mass7 d3
Breast Mass8 d1
Breast Mass8 d2
Breast Mass8 d3
Breast Mass9 d1
Breast Mass9 d2
Breast Mass9 d3
Breast Mass10 d1
Breast Mass10 d2
Breast Mass10 d3
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
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
Epididymis L
Epididymis H
Epididymis W
Scrotal Wall

Thyroid Vol

Thyroid
 Thyroid L
 Thyroid H
 Thyroid W
Testis
 Testicular L
 Testicular H
 Testicular W
Breast Mass1
 Breast Mass1 d1
 Breast Mass1 d2
 Breast Mass1 d3
Breast Mass2
 Breast Mass2 d1
 Breast Mass2 d2
 Breast Mass2 d3
Breast Mass3
 Breast Mass3 d1
 Breast Mass3 d2
 Breast Mass3 d3
Breast Mass4
 Breast Mass4 d1
 Breast Mass4 d2
 Breast Mass4 d3
Breast Mass5
 Breast Mass5 d1

Breast Mass5 d2	Testicular Mass2 d2
Breast Mass5 d3	Testicular Mass2 d3
Breast Mass6	Testicular Mass3
Breast Mass6 d1	Testicular Mass3 d1
Breast Mass6 d2	Testicular Mass3 d2
Breast Mass6 d3	Testicular Mass3 d3
Breast Mass7	
Breast Mass7 d1	D-Mode
Breast Mass7 d2	STA
Breast Mass7 d3	ITA
Breast Mass8	• Auto calculation
Breast Mass8 d1	PS
Breast Mass8 d2	ED
Breast Mass8 d3	MD
Breast Mass9	PPG
Breast Mass9 d1	TAMAX
Breast Mass9 d2	Vol Flow(TAMAX)
Breast Mass9 d3	TAMEAN
Breast Mass10	Vol Flow(TAMEAN)
Breast Mass10 d1	DT
Breast Mass10 d2	MPG
Breast Mass10 d3	MMPG
Thyroid Mass1	VTI
Thyroid Mass1 d1	AT
Thyroid Mass1 d2	S/D
Thyroid Mass1 d3	D/S
Thyroid Mass2	PI
Thyroid Mass2 d1	RI
Thyroid Mass2 d2	PV
Thyroid Mass2 d3	HR
Thyroid Mass3	6.3 Smart bladder
Thyroid Mass3 d1	• Auto trace of bladder border in transverse and vertical section
Thyroid Mass3 d2	• Auto measurement of bladder volume
Thyroid Mass3 d3	6.4 Report
Epididymis	• Specific report template by application
Epididymis L	• User-defined report template
Epididymis H	• Editable value in report
Epididymis W	• Images selectable
Testicular Mass1	• Able to Export as PDF/RTF file
Testicular Mass1 d1	* Not all measurements are listed in this part;
Testicular Mass1 d2	For more detailed information, please refer to
Testicular Mass1 d3	User Manual
Testicular Mass2	
Testicular Mass2 d1	

7 Exam Storage and Management

7.1 Exam storage

- 1TB hard drive. Max 726 GB internal hard drive for animal data storage
- Capable to store up to approximate 82602 single frames
- 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

8 Connectivity

8.1 Ethernet Network Connection

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

8.2 DICOM 3.0

- DICOM basic
 - Verify (SCU, SCP)
 - Print
 - Store
 - Storage Commitment
 - Media Exchange
- DICOM Worklist
- DICOM Query/Retrieve
- DICOM Modality Performed Procedure Step - MPPS
- DICOM Cardiac structure report

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 both iOS (7.0 and above) and Android (4.0 and above) powered system.
- For iOS powered smart device: DICOM is mandatory; For Android powered smart device: DICOM is not necessary

9 Transducers

9.1 Curved array

- 6C2
 - Application: Abdomen (Canine, Feline), Cardiology (Canine, Feline), Reproduction (Canine, Feline), Small Parts (Canine, Feline)
 - Bandwidth: 2.6~13.2 MHz
 - Number of Elements: 128
 - FOV (max): 102°
 - Extended FOV: 122°
 - Convex Radius: 15 mm
 - Depth: 0.9-29.6 cm
 - Physical Footprint: 33.5 mm × 24.8 mm
 - Footprint: 29 mm × 10 mm
 - B-mode Frequencies: 2.6~6.5, 3.2~7.9, 4.2~11.2, 5.2~13.2 [5.0, 6.5, 7.5, 8.5] MHz
 - Harmonic Frequencies: 8.0, 9.0 MHz
 - Doppler Frequencies: 4.4, 5.0 MHz
 - Biopsy Guide: NGB-005, multi angle, reusable
- C6-2
 - Application: Abdomen (Canine), Reproduction (Canine, Equine, Bovine, Ovine)

- Bandwidth: 1.3-5.7 MHz
- Number of Elements: 128
- FOV (max): 60°
- Extended FOV: 80°
- Convex Radius: 60 mm
- Depth: 2.8~38.8 cm
- Physical Footprint: 76.5mm x 28mm
- Footprint: 68mm x 19.2mm
- B-mode Frequencies: 1.3~3.2, 1.9~4.6, 2.1~5.3, 2.3~5.7 [2.0, 3.5, 4.5, 5.0] MHz
- Harmonic Frequencies: 5.0, 6.0 MHz
- Doppler Frequencies: 2.5, 3.0 MHz
- Biopsy Guide: NGB-022, multi angle, reusable

9.2 Linear

- 7L4B
 - Application: Abdomen (Canine, Feline), Small Parts (Canine, Feline)
 - Bandwidth: 3.0~14.0 MHz
 - Number of Elements: 128
 - Field of View (max): 38 mm
 - Extended FOV: 20°
 - Steered Angle: +/-6° (B); +/-20°(C, PW)
 - Depth: 0.9 - 29.6 cm
 - Physical Footprint: 61 mm × 24.4 mm
 - Footprint: 45.7 mm × 10.9 mm
 - B-mode Frequencies: 3.0~9.2, 5.4~11.5, 6.2~13, 7.0~14.0 [5.5, 6.5, 7.5, 9.0] MHz
 - Harmonic Frequencies: 9.0, 10.0 MHz
 - Doppler Frequencies: 5.0, 5.7 MHz
 - Biopsy Guide: NGB-007, multi angle, reusable
- L14-6
 - Application: Abdomen (Canine, Feline), Small Parts (Canine, Feline)
 - Bandwidth: 4.8~16.0 MHz
 - Number of Elements: 128
 - Field of View (max): 25.3 mm
 - Extended FOV: 20°
 - Steered Angle: +/-6° (B); +/-20° (C, PW)
 - Depth: 0.9-29.6 cm

- Physical Footprint: 31.6mm×22.8mm
- Footprint: 30mm× 8mm
- B-mode Frequencies: 4.8~10.6, 6.0~12.6, 7.2~14.4, 8.0~16.0 [8.0, 10.0, 12.0, 14.0] MHz
- Harmonic Frequencies: 12.0, 14.0MHz
- Doppler Frequencies: 5.7, 6.6MHz
- Biopsy Guide: NGB-016, multi angle, reusable

- L13-3

- Application: Abdomen (Canine, Feline), Small Parts (Canine, Feline)
- Bandwidth: 3.0~14.0 MHz
- Number of Elements: 128
- Field of View (max): 38mm
- Extended FOV: 20°
- Steered Angle: +/-6° (B); +/-20° (C, PW)
- Depth: 0.9-29.6 cm
- Physical Footprint: 61 mm × 24.4 mm
- Footprint: 44.2mm x 8.5mm
- B-mode Frequencies: 3.0~9.2, 5.4~11.5, 6.2~13, 7.0~14.0 [5.5, 6.5, 7.5, 9.0] MHz
- Harmonic Frequencies: 9.0, 10.0 MHz
- Doppler Frequencies: 5.0, 6.2 MHz
- Biopsy Guide: NGB-007, multi angle, reusable

9.3 Phased array

- P4-2
 - Application: Cardiology (Canine, Equine, Bovine, Ovine)
 - Bandwidth: 1.0~5.2MHz
 - Number of Elements: 64
 - Field of View (max): 90°
 - Depth: 2.8-31.4 cm
 - Physical Footprint: 25.2 mm × 20.6 mm
 - Footprint: 23.4 mm × 15.2 mm
 - B-mode Frequencies: 1.0~2.6, 1.3~3.2, 1.6~3.8, 2.2~5.2 [2.0, 2.5, 3.0, 4.0] MHz
 - Harmonic Frequencies: 3.4, 3.8 MHz
 - Doppler Frequencies: 2.0, 2.3 MHz; TDI 2.0, 2.3 MHz

- CW Frequency: 2.0 MHz
- Biopsy Guide: NGB-011, multi angle, reusable
- P8-2
 - Application: Cardiology (Canine, Feline), Abdomen (Canine, Feline)
 - Bandwidth: 2.1~8.2 MHz
 - Number of Elements: 96
 - Field of View (max): 90°
 - Depth: 2.8-27.7 cm
 - Physical Footprint: 30.5mm x 23.2mm
 - Footprint: 19.5mm x 11mm
 - B-mode Frequencies: 2.1~5.4, 2.8~6.4, 3.3~7.2, 3.8~8.2 [3.6, 5.0, 6.0, 7.0] MHz
 - Harmonic Frequencies: 6.0, 7.0 MHz
 - Doppler Frequencies: 3.3, 4.0 MHz; TDI 3.3, 4.0 MHz
 - CW Frequency: 3.3 MHz
 - Biopsy Guide: not available
- P10-4E
 - Application: Cardiology (Canine, Feline), Abdomen (Canine, Feline)
 - Bandwidth: 3.0-11.8 MHz
 - Number of Elements: 128
 - Field of View (max): 90°
 - Depth: 2.8~27.7 cm
 - Physical Footprint: 15.1mm x 10.2mm
 - Footprint: 15mm x 9.1mm
 - B-mode Frequencies: 3.0~9.2, 3.6~10.2, 4.4~11.0, 5.0~11.8 [5.5, 6.5, 7.5, 8.5] MHz
 - Harmonic Frequencies: 7.0, 8.0 MHz
 - Doppler Frequencies: 5.0, 5.7 MHz; TDI 5.0, 5.7 MHz
 - CW Frequency: 5.0 MHz
 - Biopsy Guide: not available

10 Peripheral Devices and

Accessories

10.1 Digital Color Video Printer

- SONY UP-D25MD

10.2 Graph/text printer

- HP Deskjet Ink Advantage 2020hc,
- HP Officejet Pro 8100

10.3 Analog Black and White Video Printer

- MITSUBISHI P93W-Z,
- SONY UP-X898MD

10.4 External DVR

10.5 Microphone

10.6 Gel warmer

- Easily removed from system for cleaning
- Light indicator for temperature protecting
- Switch: off, 37°C, 40°C
- Dimension: 80mm (W) x 85 mm (D) x 150mm (H) (145mm in depth)
- Weight: approx. 500g

10.7 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)

10.8 ECG

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

10.9 Barcode reader

- Laser barcode scanner
- Model: SYMBOL LS2208

10.10 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 300 Mbps

10.11 Built-in Battery

- Replaceable and rechargeable lithium battery
- Restore from standby mode: minimum 10s
- Full battery lasts more than 24h in standby mode
- Light indicator for standby mode

- Empty battery recharged to full in less than 8h
- Continuous work time: about 1 hour in B mode
- Li-ion 14.8V 6600mAh LI23I002A
- 14.8V * 6.6Ah < 100Wh

11 System Inputs and Outputs

11.1 Video/Audio input

- Microphone: 1 port
- Audio signal: 2 ports

11.2 Video/Audio output

- S-Video out: 1 port, PAL/NTSC
- Video out: 2 ports
- VGA out: 1 port
- DVI out: 1 port
- Audio out: 2 ports

11.3 Physio input

- Support ECG signal
- ECG: 1 port

11.4 Other input/output

- USB: 7 USB ports, including 1 dedicated USB port for printer
- Ethernet: 1 port

- Remote control: 2 ports

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 IEC 60601-2-37

12.3 CE declaration

This system 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.