mindray

Datasheet

DP-10Vet

2013.03

Digital Ultrasonic Diagnostic Imaging System

System Description

The DP-10Vet is intended for use in abdomen, thoracic, cardiac, tendon, small parts, eyeball and reproductive system for animals such as dog, cat, equine, bovine and ovine etc..

General Specification

Dimensions and Weight

- Depth: 161mm (6.34 inch)
- Width: 290mm (11.42 inch)
- Height: 354mm (13.94 inch)
- Net Weight: 5.1kg (single-probe socket, without battery or hard disk)

Electrical Power

Input power

- Voltage: 100-240V～
- Frequency: 50/60Hz
- Input current: 1.0- 0.5A

Battery

- Lithium-ion Battery Pack: 11.1V ⎓ , 4800mAh
- Charge time: < 3 hours (connected on AC power supply, with the system powered off)
- Endurance time: > 120 min

Boot time

- Boot time: ≤60s

Operating Environment

Ambient temperature: 0℃ ~ 40℃

Relative humidity: 30% ~ 85% (no condensation)

Atmospheric pressure: 700 hPa ~ 1060 hPa

Storage & Transportation Environment

Ambient temperature: -20℃ ~ 55℃

Relative humidity: 30% ~ 95% (no condensation)

Atmospheric pressure: 700 hPa ~ 1060 hPa

Probe

Probe Types

- Convex array
- Linear array

Scanning Methods

- Electronic convex with extend FOV
- Electronic linear with trapezoid

Probe Model

35C50EB	Convex
35C20EA	Convex
65EC10EB	Endocavity Micro-Convex
75L38EB	Linear
75L53EA	Linear
65C15EAV	Convex
50L60EAV	Linear
75L50EAV	Linear

Available Needle-guided Bracket for Probe:

35C50EB	NGB-001
75L38EB	NGB-002
35C20EA	NGB-003
65EC10EB	NGB-004
65C15EAV	NGB-005
75L53EA	NGB-007

System Configuration

Standard Configuration

- Display
  - 12.1-inch LCD, High-Resolution 1024 x 768
  - Contrast & Brightness adjustable
  - Screen Saver: Time presettable
  - Angle adjustable: 30°
- Control Panel
  - Alphanumeric Keys
  - Function Keys
  - Knobs
  - User-defined Keys: function presettable
  - 8 segment TGC

- Trackball: Color & Speed presettable
- Key Backlight Brightness & Volume presettable
- Integrated Speakers

- Indicators: Power/Battery/HDD status
- Handle
- Phase Shift harmonic imaging
- Trapezoid imaging
- ExFOV Imaging (Extended FOV for Convex Probe)
- iStation™
- 320G integrated hard disk
- I/O Interfaces
  - Transducer port: 2 (1 optional)
  - Power input port: 1 (Connect to the AC power supply)
  - USB port: 2
  - VGA OUT port: 1
  - Video OUT: 1
  - S-Video OUT: 1 (Separate video output)
  - Ethernet port: 1 (Connect to network)
  - Remote control port: 1
- Multi-language screen display and control panel overlay
- Application categories
  - Abdomen
  - Obstetrics (Dog/Cat/Equine/Bovine/Ovine)
  - Gynecology
  - Cardiology
  - Small Parts
  - Urology
  - Vascular
  - Orthopedics
  - Nerve

Accessories

- Operator's manual
  - Basic Volume.
  - Advanced Volume.
  - Operation Note.
- Gel
- Power cord
  - 3-Flat-Pin Power Cord
  - EU Power Cord
  - US Power Cord
  - UK Power Cord
- Probe holder
- Gel holder
- Dust-proof cover
- Grounded Cable
- Video Printer Remote Cable

System Language

- Software display and keyboard input available: Chinese/English/German/Spanish/French/Italian/ Portuguese/Russian/Czech/Polish
- Keyboard input available only: Icelandic/Norwegian/Swedish/Finnish/Turkish/Danish
- Control panel overlay available: Chinese/German/Spanish/French/Italian/Portuguese /Russian/Czech/Polish
- Operation manual available: Chinese/English/German/Spanish/French/Italian /Portuguese/Russian

Options

- DICOM Basic
  - Task management
  - DICOM storage
  - DICOM print
  - DICOM storage commitment
  - DICOM media storage (including DICOM DIR)
- DICOM Worklist (DICOM Basic be configured)
- Keys for option functions
- Battery Pack: Li-ion LI23I002A (configured in factory)
- Hard disk (configured in factory)
- External USB DVD-RW: SE-S224
- Footswitch:
  - 971-SWNOM (2-pedal or 3-pedal)
  - FS-81-SP (1-pedal)
- Mobile trolley: UMT-110
  - Weight: 21kg
  - Width: 445mm
  - Depth: 535mm
  - Height: selective (not available after installed): 810mm, 870mm, 2 levels
- Dual-probe socket
- Carrying bag
- Probes
- Needle-guided brackets
- Anti-reflection screen (not for FDA region)

Peripherals Supported

Graph / text printer		HP Color Laserjet CM1015 MFP HP LaserJet p1007 HP deskjet 1280 HP officejet 6000 HP OfficeJet J3600 HP LaserJet 1020 plus
Analog Color Video Printer		SONY UP-20 MITSUBISHI CP910E
Black and White Video Printer	Analog	SONY UP-897MD MITSUBISHI P93W-Z
	Digital	SONY UP-D897

Exam Mode

- ABD
- SMP
- OB
- Cardiac
- Vascular

Imaging Mode

- B-Mode
  - Tissue Harmonic Imaging
  - Phase Shift Harmonic Imaging
- Trapezoid Imaging for Linear Probe
- ExFOV Imaging (Extended FOV for Convex Probe)
- M -Mode
- Display Mode:
  - Dual live: B/M
  - Time line display:top/bottom (1:1, 2：1, 1:2, Full)
  - Single window
  - Dual-split: B/M, B/B
  - Quad-split: 4B

Imaging Features

- Multi-frequency probes for 2D imaging modes
- TSI (Tissue Specific Imaging)
- Spot Zoom and Pan Zoom

B Mode

- Display Depth
  - Minimum: 0.9 cm
  - Maximum: 37.8 cm
- Frame rate (Max.):
  - B mode: 400 fps
- Adjustable focus number: 4
- Adjustable focus positions (Max.): 16
- Magnification factor：
  - Pan Zoom: 100%-1000%, 10 steps
  - Spot Zoom: continuously adjustable
- System dynamic range: 30~220dB, 39steps
- Frequency: 2.0~12.0MHz (transducer dependant), 6 steps
- Gain: 0~100dB, 51steps
- TGC: 8
- Gray map: 1~8
- Colorize map: off, 1~16
- ExFOV: on/off (Trapezoid imaging for linear probe)
- FOV: on/off, continuously adjustable
- IP: 1~8
- Persistence: 0~7
- R/L, U/D Flip
- Rotation: 0°, 90°, 180°, 270°
- Line Density: L, M, H, UH
- A.power: 7%~100%, 32steps
- Smooth: 1~4
- TSI: General, Fat, Fluid, Muscle
- HScale: on/off
- Lithotrity: on/off
- Gray Rejection: 0~5
- γ: 0~3
- Curve: adjustable
- Gray Invert: on/off
- Auto Merge: on/off, linear probe, Dual display mode

M Mode

- Gain: 0~100
- Speed: 1~6
- Edge Enhance: 0~14
- M Soften: 0~14

Display Annotations

- Manufacturer logo
- Hospital name: up to 64 characters can be displayed
- Exam date: 3 types selectable, YY/MM/DD, MM/DD/YY, DD/MM/YY
- Exam time: 2 formats
- Acoustic output indices: MI, TIC, TIS, TIB
- Freeze icon

- Gender
- Age
- Animal: Dog/ Cat/ Equine/ Bovine/ Ovine /Other
- Animal ID: up to 64 characters can be displayed
- Other ID: up to 64 characters can be displayed
- Name: up to 64 characters can be displayed
- No.
- Host
- Probe model
- Current exam mode
- Accession#
- Operator: up to 64 characters can be displayed
- Menu
- Image
- Probe orientation mark
- Time line
- Coordinate axis, including depth, time
- TGC curve
- Focus
- Comment
- Body Mark
- Measure caliper
- Gray scale bar
- Thumbnail
- Help information
- Status icons
- Biopsy guideline
- Measure result window (up to 8 results can be displayed)
- Image parameters

Comments and Body Mark

Comment

Text comment

- Comment text for all exam modes
- Custom: add/delete/edit comment units in current menu.

Arrow

- Arrow size
- Arrow position
- Arrow orientation

Body Mark

Application package

- Body marks for all exam modes:
- Custom: import/delete body marks

Storage/ Connection

- 320G integrated hard disk
- External DVD-R/W (Optional)
- 2 USB ports
- Image archive on hard disk, DVD, iStorage (Advanced Network Storage) and temporary saving in cine memory
- Clipboard
- Thumbnail
- Single-frame image formats: BMP, JPG, DCM, FRM(supports off-line analysis)
- Multi-frame images formats: AVI, DCM, CIN, (supports off-line analysis)
- Storage area:
  - Image area: 640×480
  - Standard area: 800×600
  - Full-screen: 1024×768
- iVision: Demo player
- Cine review: Auto, Manual (auto review segment can be set), supports linked cine review for 2D, M images.
- Cine memory capacity (Max.)
  - Clip length presettable: 1-60s
  - B mode: 11959 frames
  - M mode: 110.0 s
- Max. frames in HDD
  - BMP: >130000
  - FRM: >98000
- iStorage (Advanced Network Storage)
- DICOM:
  - DICOM Basic
    - Task management
    - DICOM storage
    - DICOM print
    - DICOM storage commitment
    - DICOM media storage (including DICOM DIR)
  - DICOM Worklist

iStation™

Intelligent animal data management system

- Integrated search engine for animal data
- Detailed animal information view
- Intelligent data backup/ restore

- Animal data/ image sending
- Animal data deleting
- Exam managing: create new exam, activate exam and continue exam
- Recycle Bin
- Task manager

Measure/Calc/Study

Caliper

2D-mode

- Depth
- Distance
- Angle
- Area&Circ (Trace/ Ellipse/ Spline/ Cross)
- Volume
- Cross
- Parallel
- T Length
- Ration (D)
- Ratio (A)
- B-Hist
- B-Profile

M-mode

- HR
- Slope
- Distance
- Time
- Velocity

Application

Abdomen

- 2D-mode Measure
  - Liver
  - Renal L (Renal Length)
  - Renal H (Renal Height)
  - Renal W (Renal Width)
  - Cortex (Renal Cortical Thickness)
  - Adrenal L (Adrenal Length)
  - Adrenal H (Adrenal Height)
  - Adrenal W (Adrenal Width)
  - CBD (Common bile duct)
  - Portal V Diam (Portal Vein Diameter)
  - CHD (Common hepatic duct)
  - GB L (Gallbladder Length)
  - GB H (Gallbladder Height)
  - GB wall th (Gallbladder wall thickness)
  - Panc duct (Pancreatic duct)
  - Panc head (Pancreatic head)
  - Panc body (Pancreatic body)
  - Panc tail (Pancreatic tail)
  - Spleen
  - Aorta Diam (Aorta Diameter)
  - Aorta Bif
  - Iliac Diam (Iliac Diameter)
  - Pre-BL L (Previous-Bladder Length)
  - Pre-BL H (Previous-Bladder Height)
  - Pre-BL W (Previous-Bladder Width)
  - Post-BL L (Posterior-Bladder Length)
  - Post-BL H (Posterior-Bladder Height)
  - Post-BL W (Posterior-Bladder Width)
  - Ureter
- 2D-mode Calculation
  - Renal Vol (Renal Volume)
  - Pre-BL Vol (Previous-Bladder Volume)
  - Post-BL Vol (Posterior-Bladder Volume)
  - Mictur.Vol (Micturated Volume)
- 2D-mode study
  - Kidney
  - Adrenal
  - Bladder

Obstetrics

- 2D-mode Measure
  - Dog CRL (Dog Crown Rump Length)
  - Dog GS (Dog Gestational Sac Diameter)
  - Dog HD (Dog Head Diameter)
  - Dog BD (Dog Body Cavity Diameter)
  - Cat BD (Cat Body Cavity Diameter)
  - Cat HD (Cat Head Diameter)
  - Equine GS-H (Equine Gestational Sac Diameter Horizontal)
  - Equine GS-V (Equine Gestational Sac Diameter Vertical)
  - Bovine CRL (Bovine Crown Rump Length)
  - Bovine TD (Bovine Trunk Diameter)
  - Bovine HD (Bovine Head Diameter)
  - Ovine CRL (Ovine Crown Rump Length)
  - Ovine BPD (Ovine Biparietal Diameter)
- Fetal Weight Formulae: 11

Cardiology

- 2D-mode Measure
  - LA Diam (Left Atrium Diameter)
  - LA Major (Left Atrium major Diameter)
  - LA Minor (Left Atrium minor Diameter)
  - RA Major (Right Atrium major Diameter)
  - RA Minor (Right Atrium minor Diameter)
  - LV Major (Left Ventricular major Diameter)
  - LV Minor (Left Ventricular minor Diameter)
  - RV Major (Right Ventricular major Diameter)
  - RV Minor (Right Ventricular minor Diameter)
  - LA Area (Left Atrium area)
  - RA Area (Right Atrium area)
  - LV Area(d) (Left Ventricular area at end-diastole)
  - LV Area(s) (Left Ventricular area at end-systole)
  - RV Area(d) (Right Ventricular area at end-diastole)
  - RV Area(s) (Right Ventricular area at end-systole)
  - LVIDd (Left Ventricular Internal Diameter at end-diastole)
  - LVIDs (Left Ventricular Internal Diameter at end-systole)
  - RVDd (Right Ventricular Diameter at end-diastole)
  - RVDs (Right Ventricular Diameter at end-systole)
  - LVPWd (Left Ventricular Posterior wall thickness at end-diastole)
  - LVPWs (Left Ventricular Posterior wall thickness at end-systole)
  - RVAWd (Right Ventricular Anterior wall thickness at end-diastole)
  - RVAWs (Right Ventricular Anterior wall thickness at end-systole)
  - IVSd (Interventricular Septal thickness at end-diastole)
  - IVSs (Interventricular Septal thickness at end-systole)
  - Ao Diam (Aorta Diameter)
  - Ao Arch Diam (Aorta arch Diameter)
  - Ao Asc Diam (Ascending Aorta Diameter)
  - Ao Desc Diam (Descending Aorta Diameter)
  - Ao Isthmus (Aorta Isthmus Diameter)
  - Ao st junct (Aorta ST junct Diameter)
  - Ao Sinus Diam (Aorta Sinus Diameter)
  - Duct Art Diam (Ductus Arteriosus Diameter)
  - Pre Ductal (Previous ductal Diameter)
  - Post Ductal (Posterior ductal Diameter)
  - ACS (Aortic Valve Cusp Separation)
  - LVOT Diam (Left Ventricular Outflow Tract Diameter)
  - AV Diam (Aorta Valve Diameter)
  - AVA (Aortic Valve Area)
  - PV Diam (Pulmonary valve Diameter)
  - LPA Diam (Left pulmonary Artery Diameter)
  - RPA Diam (Right pulmonary Artery Diameter)
  - MPA Diam (Main pulmonary Artery Diameter)
  - RVOT Diam (Right Ventricular Outflow Tract Diameter)
  - MV Diam (Mitral Valve diameter)
  - MVA (Mitral Valve area)
  - MCS (Mitral Valve Cusp Separation)
  - EPSS (Distance between point E and Interventricular Septum when mitral valve is fully open)
  - TV Diam (Tricuspid valve Diameter)
  - TVA (Tricuspid Valve Area)
  - IVC Diam(Insp) (Inferior vena cava inspiration Diameter)
  - IVC Diam(Expir) (Inferior vena cava expiration Diameter)
  - SVC Diam(Insp) (Superior vena cava inspiration Diameter)
  - SVC Diam(Expir) (Superior vena cava expiration Diameter)
  - LCA (Left Coronary Artery)
  - RCA (Right Coronary Artery)
  - VSD Diam (Ventricular Septal defect Diameter)
  - ASD Diam (Atrial Septal defect Diameter)
  - PDA Diam (Patent ductus Arteriosus Diameter)
  - PFO Diam (Patent Oval Foramen Diameter)
  - PEd (Pericardial Effusion at diastole)
  - PEs (Pericardial Effusion at systole)
  - HR (Heart Rate)
  - Diastole
  - Systole
- 2D-mode Calculation
  - LA/Ao (Left Atrium Diameter/Aorta Diameter)
  - Ao/LA (Aorta Diameter/Left Atrium Diameter)
- M-mode Measure
  - LA Diam (Left Atrium Diameter)
  - LVIDd (Left Ventricular Internal Diameter at end-diastole)

- LVIDs (Left Ventricular Internal Diameter at end-systole)
- RVDd (Right Ventricular Diameter at end-diastole)
- RVDs (Right Ventricular Diameter at end-systole)
- LVPWd (Left Ventricular Posterior wall thickness at end-diastole)
- LVPWs (Left Ventricular Posterior wall thickness at end-systole)
- RVAWd (Right Ventricular Anterior wall thickness at end-diastole)
- RVAWs (Right Ventricular Anterior wall thickness at end-systole)
- IVSd (Interventricular Septal thickness at end-diastole)
- IVSs (Interventricular Septal thickness at end-systole)
- Ao Diam (Aorta Diameter)
- Ao Arch Diam (Aorta arch Diameter)
- Ao Asc Diam (Ascending Aorta Diameter)
- Ao Desc Diam (Descending Aorta Diameter)
- Ao Isthmus (Aorta Isthmus Diameter)
- Ao st junct (Aorta ST junct Diameter)
- Ao Sinus Diam (Aorta Sinus Diameter)
- LVOT Diam (Left Ventricular outflow tract Diameter)
- ACS (Aortic valve Cusp Separation)
- LPA Diam (Left pulmonary Artery Diameter)
- RPA Diam (Right pulmonary Artery Diameter)
- MPA Diam (Main pulmonary Artery Diameter)
- RVOT Diam (Right Ventricular outflow tract Diameter)
- MV E Amp (Amplitude of the Mitral Valve E wave)
- MV A Amp (Amplitude of the Mitral Valve A wave)
- MV E-F Slope (Mitral Valve E-F slope)
- MV D-E Slope (Mitral Valve D-E slope)
- MV DE (Amplitude of the Mitral Valve DE wave)
- MCS (Mitral Valve Cusp Separation)
- EPSS (Distance between point E and the interventricular septum)
- PEd (Pericardial effusion at diastole)
- PEs (Pericardial effusion at systole)
- LVPEP (Left Ventricular pre-ejection period)
- LVET (Left Ventricular ejection time)
- RVPEP (Right Ventricular pre-ejection period)
- RVET (Right Ventricular ejection time)
- HR (Heart Rate)
- Diastole
- Systole

- M-mode Calculation
  - LA/Ao (Left Atrium diameter/Aorta diameter)
  - Ao/LA (Aorta Diameter/Left Atrium Diameter)
- Cardiac Study Items

  2D-mode:
  - S-P Ellipse
  - B-P Ellipse
  - Bullet
  - Mod.Simpson
  - Simpson SP (A2C)
  - Simpson SP (A4C)
  - Simpson BP
  - Cube
  - Teichholz
  - Gibson
  - LA Vol(A-L)
  - LA Vol (Simp)
  - RA Vol (Simp)
  - LV Mass (Cube)
  - LV Mass (A-L)
  - LV Mass (T-E)

  M-mode:
  - LVIMP
  - Cube
  - Teichholz
  - Gibson
  - LV Mass (Cube)

Vascular

- 2D-mode Calculation
  - Stenosis D (Stenosis Diameter)
  - Stenosis A (Stenosis Area)

Gynecology

- 2D-mode Measure
  - UT L
  - UT H
  - UT W
  - Cervix L
  - Cervix H
  - Cervix W
  - Endo
  - Ovary L
  - Ovary H
  - Ovary W

- Follicle1-16 L
- Follicle1-16 W
- Follicle1-16 H

- 2D-mode Calculation
  - Ovary Vol
  - UT Vol
  - Uterus Body
  - UT-L/ CX-L
  - Follicle 1~16
- 2D-mode Study
  - Uterus (Length, height and width of uterus, endometrium thickness)
  - Uterine Cervix (Length, height and width of uterine cervix)
  - Ovary (Length, height and width of ovary)
  - Follicle 1-16 (Length and width of follicle 1-16)

Urology

- 2D-mode Measure
  - Renal L
  - Renal H
  - Renal W
  - Cortex
  - Adrenal L
  - Adrenal H
  - Adrenal W
  - Prostate L
  - Prostate H
  - Prostate W
  - Seminal L
  - Seminal H
  - Seminal W
  - Testis L
  - Testis H
  - Testis W
  - Ureter
  - Pre-BL L
  - Pre-BL H
  - Pre-BL W
  - Post-BL L
  - Post-BL H
  - Post-BL W
  - Prostate Mass1 d1~d3
  - Prostate Mass2 d1~d3
  - Prostate Mass3 d1~d3
  - Testis Mass1 d1~d3
  - Testis Mass2 d1~d3
  - Testis Mass3 d1~d3
- 2D-mode Calculation
  - Renal Vol
  - Prostate Vol
  - Testis Vol
  - Pre-BL Vol
  - Post-BL Vol
  - Mictur.Vol
- 2D-mode Study
  - Kidney
  - Adrenal
  - Prostate
  - Seminal Vesicle
  - Testis
  - Bladder
  - Prostate Mass1~3
  - Testis Mass1~3

Small Parts

- 2D-mode Measure
  - Thyroid L
  - Thyroid H
  - Thyroid W
  - Isthmus H
  - Testis L (Testicular Length)
  - Testis H (Testicular Height)
  - Testis W (Testicular Width)
  - Breast Mass1 d1-d3
  - Breast Mass2 d1-d3
  - Breast Mass3 d1-d3
  - Thyroid Mass1 d1-d3
  - Thyroid Mass2 d1-d3
  - Thyroid Mass3 d1-d3
- 2D-mode Calculation
  - Thyroid Vol
- 2D-mode Study
  - Thyroid
  - Testis
  - Breast Mass1-3
  - Thyroid Mass1-3

Orthopedics

- 2D-mode Measure
  - HIP
  - HIP-Graf
  - d/D

Diagnostic Report

- View/add images
- Data edit
- Print
- Import
- export (to PDF/RTF file)
- View history report
- Obstetric analysis
- Fetal growth curve

Safety & Conformance

Quality Standards

- ISO 9001:2008
- ISO 13485:2003

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 14971 and ISO 14971
- EN ISO10993-1 and ISO10993-1
- EN 62366 and IEC 62366
- EN 62304 and IEC 62304
- EN ISO 17664
- EN 1041
- EN 980
- IEC 60878

CE Declaration

DP-10Vet system is fully in conformance with the EC Low Voltage Directive (2006/95/EC) and EC Directive of Electromagnetic Compatibility (2004/108/EC).

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

No part of this manual may be copied or printed, in whole or in part, without written permission.
The contents of this manual are subject to change without prior notice and without our legal obligation.

Note: the contents in this datasheet are applied to Version 1.0 of system software for DP-10Vet Digital Ultrasonic Diagnostic Imaging System.

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