
displays a next active caliper.

Note: At least three calipers are needed to form a polygon.

10. Repeat Steps 8-9 to add more calipers to the polygon.

11. To complete the measurement, press "Enter". The system displays the thorax circumference in the Results Window.

Note:

Before completing the polygon measurement,

- To erase the line (little by little) back from its current point, press "Clear" key once;
- To clear the trace caliper and the current data measured, press "Clear" for at least 2 seconds.

To measure Thorax Circumference with the Spline method, make a spline trace measurement. The steps are as follows:

1. Press "Measure".

2. Select "THC".

3. Select the measurement method Spline as the default setting from the configuration menu, and an active tracing caliper displays.

4. To position the active caliper of the spline, move the trackball.

5. To fix the start point, press "Enter". The system fixes the first caliper and displays a second active caliper.

6. To position the second caliper, move the trackball.

7. To fix the second point, press "Enter". The system fixes the second caliper and displays a third active caliper.

8. To position the third caliper, move the trackball.

9. To fix the third point, press "Enter". The system fixes the third caliper and displays a next active caliper.

Note: At least three calipers are needed to form a spline.

10. Repeat Steps 8-9 to add more caliper of the spline.

11. To complete the measurement, press "Enter". The system displays the thorax circumference in the results window.

Note:

Before completing the spline measurement,

- To erase the line (little by little) back from its current point, press "Clear" key once;
- To clear the trace caliper and the current data measured, press "Clear" for at least 2 seconds.

To measure Thorax Circumference with the Trace method, the steps are as follows:

1. Press "Measure".

2. Select "THC".

3. Select the measurement method Trace as the default setting from the configuration menu, and an active tracing caliper displays.

-
4. To position the trace caliper, move the trackball.
 5. To fix the trace start point, press "Enter". The system fixes the first caliper and the trace caliper changes to an active tracing caliper.
 6. To trace the measurement area, move the Trackball around the anatomy.
 7. To complete the measurement, press "Enter". The system displays the thorax circumference in the results window.

Note:

Before completing the spline measurement,

- To erase the line (little by little) back from its current point, press "Clear" key once;
- To clear the trace caliper and the current data measured, press "Clear" for at least 2 seconds.

Fetal Cardiac Thorax Diameter Ratio (CTDR)

To measure Fetal Cardiac Thorax Diameter Ratio, make two distance measurements. The steps are as follows:

1. Press "Measure".
2. Select "CTDR", and an active tracing caliper display.
3. Perform a standard distance measurement. The system displays the distance value in the results window.
4. Repeat Step 3 to make the second distance measurement.
5. After the second distance measurement is completed, the system displays the cardiac thorax diameter ratio in the results window.

Fetal Cardiac Thorax Area Ratio (CTAR)

To measure Fetal Cardiac Thorax Area Ratio, make two area measurements. The steps are as follows:

1. Press "Measure".
2. Select "CTAR", and an active tracing caliper displays.
3. Perform a standard area measurement with the default measurement method. The system displays the area value in the results window.
4. Repeat Step 3 to make the second area measurement.
5. After the second area measurement is completed, the system displays the cardiac thorax area ratio in the results window.

Spinal Length (SL)

To measure Spinal Length, the steps are as follows:

1. Press "Measure".
2. Select "SL", and an active tracing caliper displays.
3. Perform a standard distance measurement. The system displays the spinal length in the results window.

Femur Length (FL)

To measure Femur Length, the steps are as follows:

-
1. Press “Measure”.
 2. Select “FL”, and an active tracing caliper displays.
 3. Perform a standard distance measurement. The system displays the femur length in the results window.

Measure “FL” with “Auto” method:

1. Press “Measure”.
2. Select “FL” in “Config” page, touch “Auto”.
3. Save and exit.
4. Move the cursor to the image, press “Enter” key.
5. The system will get the result of “FL” automatically.

Ulnar Length (ULNA)

To measure Ulnar Length, the steps are as follows:

1. Press “Measure”.
2. Select “ULNA”, and an active tracing caliper displays.
3. Perform a standard distance measurement. The system displays the ulnar length in the results window.

Radius Length (RAD)

To measure Radius Length, the steps are as follows:

1. Press “Measure”.
2. Select “RAD”, and an active tracing caliper displays.
3. Perform a standard distance measurement. The system displays the radius length in the results window.

Tibial Length (TIB)

To measure Tibial Length, the steps are as follows:

1. Press “Measure”.
2. Select “TIB”, and an active tracing caliper displays.
3. Perform a standard distance measurement. The system displays the tibial length in the results window.

Fibular Length (FIB)

To measure Fibular Length, the steps are as follows:

1. Press “Measure”.
2. Select “FIB”, and an active tracing caliper displays.
3. Perform a standard distance measurement. The system displays the fibular length in the results window.

Foot Length (Ft)

To measure Foot Length, the steps are as follows:

1. Press “Measure”.
2. Select “Ft”, and an active tracing caliper displays.

3. Perform a standard distance measurement. The system displays the foot length in the results window.

Placenta Thickness (PT)

To measure Placenta Thickness, the steps are as follows:

1. Press "Measure".
2. Select "PT", and an active tracing caliper displays.
3. Perform a standard distance measurement. The system displays the placenta thickness in the results window.

Amniotic Fluid Index (AFI)

To calculate the Amniotic Fluid Index, make measurements of the four quadrants of the uterine cavity. The system adds these four measurements together to calculate the Amniotic Fluid Index. The steps are as follows:

1. Press "Measure".
2. Select "AFI". The first distance measurement, AFI-Q1, is already selected.
3. Make a standard distance measurement for the first quadrant:
 - a. To position the active caliper at the start point, move the trackball.
 - b. To fix the start point, press "Enter". The system fixes the first caliper and displays a second active caliper.
 - c. To position the second active caliper at the end point, move the trackball. A dotted line connects the measurement points.
 - d. To complete the measurement, press "Enter". The system displays the distance value in the results window.
4. When the measurement of the first quadrant is completed, unfreeze the image and move to the second quadrant.
5. After the image is obtained, then "Freeze" and "Measure" are pressed. The system prompts to continue with the AFI measurements. Make sure that the next quadrant has been selected.
6. Perform a standard distance measurement for the second, third and fourth Quadrants, repeat step 2.
7. When all four quadrants have been measured, the system calculates the AFI total and displays it in the results window.

Cervix L, Cervix W, Cervix H

To measure Cervix L/W/H there are 4 methods: Distance, Polygon, Spline, Trace.

Nasal Bone

To measure Nasal Bone, the steps are as follows:

1. Press "Measure".
2. Select "Nasal Bone", and an active tracing caliper displays.
3. Perform a standard distance measurement. The system displays the length of nasal bone in the results window.

Lat Ventricle

To measure Lat Ventricle, the steps are as follows:

1. Press "Measure".
2. Select "Lat Ventricle", and an active tracing caliper displays.
3. Perform a standard distance measurement. The system displays the length of lat ventricle in the results window.

Internal os

To measure Internal os, the steps are as follows:

1. Press "Measure".
2. Select "Internal os", and an active tracing caliper displays.
3. Perform a standard distance measurement. The system displays the length of internal os in the results window.

Cardiac Axis

To measure Cardiac Axis, the steps are as follows:

1. Press "Measure".
2. Select "Cardiac Axis", and an active tracing caliper displays.
3. Perform a standard distance measurement. The system displays the length of cardiac axis in the results window.

Vaim (OB)

"Vaim" means intelligent measurement. The feature only can be used under these items: OB, Pelvic, Uterus, Follicle and Ped Hip.

To execute the Vaim measurements, the steps are as follows:

1. Choose the OB application.
2. Touch "Vaim" press.
3. The results can be calculated automatically and shown in the screen.

OB Ratio:

- HC/AC
- FL/AC
- FL/BPD
- CI (BPD/OFD)
- FL/HC
- TCD/AC

To get the ratio result need to finish the two sub-items.

GA(LMP)

GA(LMP): Gestational age that is calculated based on the date of Last Menstrual Period.

GA(GA)

GA(GA):Gestational age(GA) is to show from the zona-binding count that day to birth. The normal maturity is 38 weeks (266 days) for the fetus. Because of zona-binding the time cannot be precisely calculated. It can only be estimated, and the average time could be reduced by 2 weeks according to the menstrual age calculation. When in the patient information, input the date of the last menstruation, and the system will automatically calculate the gestational age GA. Another method is to measure the results calculated according to some gestational age.

EDDbyLMP

EDDbyLMP: Estimated delivery date that is calculated from the time of Last Menstrual Period. When in the patient information, input the end time period of time, the system will automatically calculate the estimated delivery date by LMP (EDDbyLMP).

EDDbyGA

EDDbyGA: When the system obtains the gestational age(GA), the system will automatically calculate the delivery date gestational age estimates (EDDbyGA).

Multiple Fetus Measurement

The system allows to measure and report multiple fetus development. If more than one fetus is imaged during the examination, enter the number of fetuses in the patient information window, and there will be "ABCD" in measurement menu (take 4 fetuses for example):

- A, B, C, D is the specific fetus, and 4 is the fetal quantity.
- Switch among A/4, B/4, C/4 and D/4 to take the measurement on the specific fetus.

Estimated Fetal Weight (EFW)

Estimated Fetal Weight measurement is applied for OB Mid and OB Late application only.

If "Auto Select EFW Method" is enabled in system setting, after do one or more OB related measurements, like BPD, FL, HC, AC, the system will select one method to calculate EFW automatically.

If it is disabled, select one method, the do the related measurements, the system will calculate EFW.

EFW methods are depended on the selected EFW table in the system setting.

OB Curve Graph

OB Graphs allow to assess fetal growth compared to a normal growth curve. When a patient has completed two or more ultrasound examinations, the graphs can be used to look at fetal trending. For multi-gestational patients can

plot all fetuses and compare the growth on the graphs.

The system provides the following two basic types of graphs:

- **Fetal Growth Curve Graph** – show one measurement per graph. These graphs show the normal growth curve, positive and negative standard deviations or applicable percentiles, and ultrasound age of the fetus using the current measurement. For multi-gestational pregnancies can view all fetuses. If previous examination data is available, the graph can show fetal trending.
- **Fetal Growth Bar Graph** – shows the ultrasound age and the gestational age based on patient data. Plot all measurements on one graph.

To view OB graphs. The steps are as follows:

1. Press “Measure”.

2. Select “OB Graph” (only for OB application), select “Graph Type”.

3. The system provides 5 types of display format on Fetal Growth Curve Graph: Single, Dual, Quad, Multi-fetal Compare and Multi-fetal Parallel (these 2 types only work when there are 2 or more fetuses).

3.1 Single display format displays a fetal growth curve graph of any a maternity measuring parameter. Dual display format displays two fetal growth curve graphs of any two maternity measuring parameters parallel. Quad display format displays four fetal growth curve graphs of any four maternity measuring parameters together.

3.2 Multi-fetal Compare and Multi-fetal Parallel are for the fetal growth curve graph of multiple fetuses. Multi-fetal Compare displays the fetal growth curve graph of the comparison among all fetuses. Multi-fetal Parallel displays the fetal growth curve graphs of all fetuses parallel in the separate graph.

4. The system provides two types of display format on Fetal Growth Bar Graph: Single and Multi-fetal Parallel (only work when there are 2 or more fetuses).

4.1 Single display format displays a fetal growth bar graph.

4.2 Multi-fetal Parallel displays the fetal growth curve graphs of all fetuses parallel in the separate graph.

Fetal Growth Curve Graph

- The horizontal axis shows the fetal age in weeks. The system determines this age from the data on the patient information window.
- The vertical axis shows one of the following:
 - For measurements, mm or cm
 - For ratios, percent

-
- For fetal weight, grams
 - The Fetal Growth Curve Graph shows the information for the selected measurement as follows:
 - The normal growth curve
 - The standard deviations or relevant percentiles
 - The gestational age of the fetus, using patient data (vertical dotted line)
 - Using the current ultrasound measurement data, where the fetus is on the growth curve
 - The legend at the bottom of the graph shows the symbols and colors that indicate data for fetal trending (Past and Present), and multiple gestation (Fetus) in the Multi-fetal Compare Display format.
 - To select which measurement want to display on the Fetal Growth Curve Graph:
 - a. On the graph display, the system displays a list of measurements.
 - b. Select the desired measurement. The system displays the Fetal Growth Curve Graph for the selected measurement.

Fetal Growth Bar Graph

- The fetal growth bar graph shows current examination measurements and the normal growth range based on the gestational age. It shows all measurements on one graph.
 - The horizontal axis shows the gestational weeks.
 - The red vertical shows GA by LMP or EDD.
 - The white “X” shows the ultrasound average age using the current measurement.
 - The green rectangle shows the normal age range for the measurement.
- To add a new measurement to be displayed on the Fetal Growth Bar Graph, do one of the following:
 - a. On the graph display, the system displays a list of measurements.
 - b. Select the desired measurement. The system displays the new selected measurement on the Fetal Growth Bar Graph.

To Edit Patient Data on the Fetal Growth Graph

When working with graphs can change or enter the patient data as follows.

Note: Select the field to be changed or entered. The system allows to input the patient data.

- LMP: the time of last menstrual period of the patient.
- BBT: the time of basal body temperature of the patient.
- GA: this field is computed using the LMP/BBT/Avg.US date on the Patient information Window. Or show the data inputted.

-
- EDD: this field is computed using GA.

To change GA:

- a. Select the field.
- b. Type the correct weeks or days.

The system makes the following changes:

-GA (LMP/BBT) is now GA (GA) and shows the age entered.

-In the Patient Data section, the GA changes.

-In the Patient Data section, the EDD shows an updated date, using the GA entered.

- Fetus Position: type information about the fetus position.
- Placenta: type information about the placenta.

If there are more than one printer connected with this device, touch printer button to choose one printer. Touch “>” to configure printer’s setting. Touch button “Print” to print the OB graph.

10.8.2 M Mode measurements

In “M” mode of Obstetrics application, it includes measurement items as follows:

- Depth
- Distance
- LVEF
- HR
- A/B Ratio

10.8.3 PW mode measurements

In “PW” mode of Obstetrics application, it includes measurement folders as follows:

- General
- Aorta
- Desc.Aorta
- Umbilical
- Placenta
- Uterus
- Follicle
- MCA

General Measurement Folder:

- Velocity

-
- PS
 - ED
 - MD
 - TAMAX
 - PI
 - RI
 - HR

Other Measurement Folders:

- Velocity
- PS
- ED
- PI
- RI
- HR

Note:

Configure the measurement menu of all Measurement Folders by adding or removing the measurement items in the Measurement Folders. Refer to the “Measurement Menu Configuration” in the chapter “General Measurements” for how to make the configuration of the measurement menu.

10.9 Cardiac Measurements

Introduction

Based on the application of different subjects, age and weight, Cardiac measurement provides the different measurement options of each chamber and the corresponding valve in diastolic and systolic period:

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

Overview

Cardiac measurements provides the main measurement folders: General, LV, MV, Ao, AV, LA, RV, TV, PV, RA, and System, on the B/M、CF、PW/CW/TD mode of this device.

Measurement Configuration of Measuring Option Folders

To configure the measurement folder options:

1. Press “Measure”.
2. Select the configuration menu of the measurement folder options.
Note: Measurement folder option may not be same in the different mode.
3. Choose the measurement folder option which to have, or uncheck the measurement folder option which does not need but has been chosen.
4. After finishing the configuration, press “Back” to return to the previous menu, and the system shows the measurement folder list which has chosen.

In “B” mode of Cardiac examination, the General Measurement Folder includes measurements as follows:

- Depth
- Distance
- Circumference or Perimeter
- Area
- Volume
- Volume d
- Volume s

-
- %Stenosis
 - Diam
 - Area
 - A/B Ratio
 - Diam
 - Area

In “M” mode of Cardiac examination, the General Measurement Folder includes measurements as follows:

- Distance
- Time
- Slope or Velocity
- A/B Ratio
- HR

In the PW mode of Cardiac examination, the General Measurement Folder includes measurements as follows:

- Velocity
- Time
- Acceleration
- TAMAX
- TAMEAN
- A/B Ratio
 - Velocity
 - Time
 - Acceleration
- FLOW VOL
- Max PG
- Mean PG
- SV
 - SV Diam
 - VTI
- HR

Note: Refer to the chapter “General Measurements” for how to execute and configure the above measurements.

Cardiac Left Ventricular(LV) Measurement Folder

In “B” mode of Cardiac examination, the LV Measurement Folder includes measurements as follows:

Single distance measurement:

- LVIDd
- LVPWd
- LVIDs

- LVPWs
- LVd Major
- LVd Minor
- LVs Major
- LVs Minor
- LVOT Diam

To execute the single distance measurement, the steps are as follows:

1. Press “Measure”.
2. Select the distance measurement to be executed, and an active tracing caliper displays.
3. To position the active caliper at the start point, move the trackball.
4. To fix the start point, press “Enter”. The system fixes the first caliper and displays a second active caliper.
5. To position the second active caliper at the end point, move the trackball. A dotted line connects the measurement points, if preset accordingly.
6. To complete the measurement, press “Enter”. The system displays the distance value in the results window.

Multiple distance measurement:

- LV Study
 - IVSd
 - LVIDd
 - LVPWd
 - IVSs
 - LVIDs
 - LVPWs
- LV Study (Simple)
 - LVIDd
 - LVIDs
- %FS
 - LVd
 - LVs

To complete the LV Study or LV Study (Simple) measurement, perform six or two standard distance measurements continuously.

To configure the measurement setting of LV Study, the steps are as follows:

1. Press “Measure”.
2. Select “Config” then selects “LV Study” button, and a menu displays.
 - a. Select Cube or Teichholz as the calculation formula.
 - b. Choose the parameters that need to be calculated and displayed in the results window:
LVEDV, LVESV, SV, EF, CO, SI, CI, LVIDd Index, LVd Mass, LVd Mass Index, LVd

Mass(ASE), LVd Mass Index(ASE), LVIDs Index, LVs Mass, LVs Mass Index, LVs Mass(ASE), LVs Mass Index(ASE), %FS, %IVS, and %LVPW.

Note: The calculation of some parameters need to use HR and BSA, where HR can be gotten from ECG device, and BSA can be calculated through the patient's height and weight.

Area Measurement, and the measurement method option can be Polygon, Spline and Trace, where Trace method is the default setting.

- 2C LVAd
- 2C LVAs
- 4C LVAd
- 4C LVAs
- S LVAd
- S LVAs
- Endo LVAd
- Endo LVAs
- EpiLVAd
- Epi LVAs
- LVOT Area

To execute the area measurement by Trace method, the steps are as follows:

1. Press "Measure".
2. Select the area measurement to be executed.
3. Select the measurement method Trace as the default setting from the configuration menu, and an active tracing caliper displays.
4. To position the trace caliper, move the trackball.
5. To fix the trace start point, press "Enter". The system fixes the first caliper and the trace caliper changes to an active tracing caliper.
6. To trace the measurement area, move the Trackball around the anatomy.
7. To complete the measurement, press "Enter". The system displays the measured area value in the results window.

Note:

Before completing the spline measurement,

- To erase the line (little by little) back from its current point, press "Clear" key once;
- To clear the trace caliper and the current data measured, press "Clear" for at least 2 seconds.

Single Trace combined with Single Distance Measurement:

- Diastolic Period: A2C LVEDV, A4C LVEDV
- Systolic Period: A2C LVESV, A4C LVESV

When the single plane area-length method is applied, area of cross-section of the left ventricle (A), and length of the long axis of the left ventricle (L) are measured, and length of the short axis of the left ventricle (D) is calculated from

these data using the following formula on the assumption that the left ventricle is a spheroid:

- A2C A-L
 - LVAd
 - LVLd
 - LVAs
 - LVLs
- A4C A-L
 - LVAd
 - LVLd
 - LVAs
 - LVLs
- Bi-plane A2C&A4C A-L
 - A2C LVAd
 - LVLd
 - A2C LVAs
 - LVLs
 - A4C LVAd
 - A4C LVAs

To execute the multiple area and multiple distance measurements, the steps are as below:

1. Enter “Measure”, select the measurement item.
2. Press Enter key to start the measurement.
3. Fix the area with the relevant method.
4. Fix the distance.
5. Repeat step 3-4 for twice or three times to complete the measurement.

When the Single-plane/Enter Simpson Disc method is used, the long axes (L) of apical two-chamber or four-chamber views is divided equally into 20, and the inside diameters of the short axes (ai and bi) of 20 disks in directions perpendicular to the long axes are obtained. Left ventricular volume is calculated from the total sum of the cross-sectional areas of the 20 discs. The areas of the left ventricular cavity are obtained on the assumption that each disc is oval:

- A2C Simpson
 - LVEDV
 - LVESV
- A4C Simpson
 - LVEDV
 - LVESV
- Bi-plane Simpson
 - A2C LVEDV
 - A2C LVESV
 - A4C LVEDV

– A4C LVESV

To execute the multiple area and multiple distance measurements, the steps are as below:

1. Enter “Measure”, select the measurement item.
2. Press Enter key to start the measurement.
3. Fix the trace.
4. Fix the vertex.
5. Repeat step 3-4 for twice or more times to complete the measurement.

Auto EF

Configure “Auto” method for “LVEDV”, “LVESV” in “A2C Simpson”.

To execute this measurement item, the steps are as below:

1. Enter “Measure”, select the measurement item.
2. Press Enter key to fix 2 point, the system finishes the trace automatically.
3. Move the cursor to the green point, press Enter key and move the cursor at the same time to modify the trace line.
4. Press Enter key twice to fix the trace line.
5. Repeat step 2-4 for twice or more to complete the measurement.

The same steps can be executed for “A4C Simpson” and “Bi-plane Simpson”.

In “M” mode of Cardiac examination, the “LV” measurement folder includes measurements as follows:

Single Distance Measurement:

- LVIDd
- LVPWd
- LVIDs
- LVPWs

To execute the single distance measurement, the steps are as follows:

1. Press “Measure”.
2. Select the distance measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the active caliper at the most anterior point to be measured, move the trackball.
4. To fix the start point, press “Enter”. The system fixes the first caliper and displays a second active caliper.
5. To position the second caliper at the most posterior point to be measured, move the trackball.
6. To complete the measurement, press “Enter”. The system displays the vertical distance between the two points in the results window.

Multiple Distance Measurements:

- LV Study

-
- IVSd
 - LVIDd
 - LVPWd
 - IVSs
 - LVIDs
 - LVPWs
 - LV Study (Simple)
 - LVIDd
 - LVIDs
 - %FS
 - LVd
 - LVs

To complete the LV Study or LV Study (Simple) measurement, perform six or two standard distance measurements continuously.

To configure the measurement setting of LV Study, the steps are as follows:

1. Press "Measure".
2. Select "Config" then selects "LV Study" button, and a menu displays.
 - a. Select "Cube" or "Teichholz" as the calculation formula.
 - b. Choose the parameters that need to be calculated and displayed in the results window:

LVEDV, LVESV, SV, EF, CO, SI, CI, LVIDd Index, LVd Mass, LVd Mass Index, LVd Mass(ASE), LVd Mass Index(ASE), LVIDs Index, LVs Mass, LVs Mass Index, LVs Mass(ASE), LVs Mass Index(ASE), %FS, %IVS, and %LVPW.

Note: The calculation of some parameters need to use HR and BSA, where HR can be gotten from ECG device, and BSA can be calculated through the patient's height and weight.

Single Time Interval Measurement:

- LVPEP
- LVET
- MVcf
- HR(R-R)
- Q-to-PV open
- Q-to-TV open

To execute the time interval measurement, the steps are as follows:

1. Press "Measure".
2. Select the time measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the caliper at the start point, move the trackball.
4. To fix the first caliper, press "Enter". The system fixes the first caliper and displays a second active caliper.
5. To position the second caliper at the end point, move the trackball.

6. To complete the measurement, press “Enter”. The system displays the horizontal time interval between the two calipers in the results window.

In “PW” mode of Cardiac examination, the LV Measurement Folder includes the following measurements:

Single Velocity Measurement:

- LVOT Vmax
- Med Vel S
- Med Vel E'
- Med Vel A'
- Lat Vel S
- Lat Vel E'
- Lat Vel A'
- TV Vel E
- TV Vel A

To execute the velocity measurement, the steps are as follows:

1. Press “Measure”.
2. Select the velocity measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen..
3. To position the caliper at the desired measurement point, move the Trackball.
4. To complete the measurement, press “Enter”. The system displays the velocity measurement in the results window.

Double Velocity Measurement:

- LVOT Max PG
 - Vmax1
 - Vmax2
- E/Med E'
 - MV E
 - MV Med E'
- Med E'/E
 - MV Med E'
 - MV E
- E/Lat E'
 - MV E
 - MV Lat E'
- Lat E'/E
 - MV Lat E'
 - MV E

To execute the two velocity measurements, the steps are as follows:

1. Press “Measure”.
2. Select the double velocity measurement which to be execute, a vertical and

horizontal dotted line and an active tracing caliper will display on the image screen.

3. To position the caliper at the desired measurement point, move the Trackball.
4. To complete the first velocity measurement, press "Enter". The system displays the first velocity measurement in the Results Window, and a second active caliper with a vertical and horizontal dotted line displays.
5. To position the caliper at the desired measurement point, move the Trackball.
6. To complete the second velocity measurement, press "Enter". The system displays the second velocity measurement and Max PG in the results window.

Single Time Interval Measurement:

- LVET
- LVHR
- Q-to-PV open
- Q-to-TV open

To execute the time interval measurement, the steps are as follows:

1. Press "Measure".
2. Select the time measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen..
3. To position the caliper at the start point, move the trackball.
4. To fix the first caliper, press "Enter". The system fixes the first caliper and displays a second active caliper.
5. To position the second caliper at the end point, move the trackball.
6. To complete the measurement, press "Enter". The system displays the horizontal time interval between the two calipers in the results window.

Single Trace Measurement:

- LVOT Trace

To execute the trace measurement, the steps are as follows:

1. Press "Measure".
2. Select the trace measurement to be executed, an active trace caliper displays.
3. To fix the start point, press "Enter".
4. To trace the velocities of the desired portion of the spectrum, move the trackball.

Note: To re-edit the existing trace line, press "Clear" once and move the trackball again.

5. To complete the measurement, press "Enter". The system displays the measurement values in the results window.

To configure the trace measurement:

Configure the single trace measurement to define the parameter that needs to be calculated and displayed in the Results Window.

-
1. Press "Measure".
 2. Select "Config", then select "LVOT Trace", and a menu displays.
 3. Choose the measurement to be executed.

Single Trace combined with Single Distance Measurement:

- SV (Stroke Volume)
 - SV Diam
 - SV TAMEAN
- PISA MR
 - Radius
 - VTI

To measure SV, the steps are as follows:

1. Press "Measure".
2. Select "SV".
3. Select "SV Diam", and perform the single distance measurement.
4. Select "SV TAMEAN", and perform the single trace measurement.
5. The system displays measurement values in the results window.
6. If there is HR measurement result or get HR from ECG, the system will calculate CO and CI.

Cardiac Mitral Valve(MV) Measurement Folder

In "B" mode of Cardiac examination, the MV Measurement Folder includes measurements as follows:

Single Distance Measurement:

- MV Ann Diam
- EPSS
- MR Radius(only available in the CFI mode)

To execute the single distance measurement, the steps are as follows:

1. Press "Measure".
2. Select the distance measurement to be executed, and an active tracing caliper displays.
3. To position the active caliper at the start point, move the trackball.
4. To fix the start point, press "Enter". The system fixes the first caliper and displays a second active caliper.
5. To position the second active caliper at the end point, move the trackball. A dotted line connects the measurement points, if preset accordingly.
6. To complete the measurement, press "Enter". The system displays the distance value in the results window.

Area Measurement, and the measurement method option can be Polygon, Spline and Trace, where Trace method is the default setting.

-
- MVA by PHT

To execute the area measurement by “Trace” method, the steps are as follows:

1. Press “Measure”.
2. Select the area measurement to be executed.
3. Select the measurement method “Trace” as the default setting from the configuration menu, and an active tracing caliper displays.
4. To position the trace caliper, move the trackball.
5. To fix the trace start point, press “Enter”. The system fixes the first caliper and the trace caliper changes to an active tracing caliper.
6. To trace the measurement area, move the Trackball around the anatomy.
7. To complete the measurement, press “Enter”. The system displays the measured area value in the results window.

Note:

Before completing the spline measurement:

- To erase the line (little by little) back from its current point, press “Clear” once;
- To clear the trace caliper and the current data measured, press “Clear” for at least 2 seconds.

In “M” mode of Cardiac examination, the MV Measurement Folder includes measurements as follows:

Single Distance Measurement:

- EPSS

To execute the single distance measurement, the steps are as follows:

1. Press “Measure”.
2. Select the distance measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the active caliper at the most anterior point to be measured, move the trackball.
4. To fix the start point, press “Enter”. The system fixes the first caliper and displays a second active caliper.
5. To position the second caliper at the most posterior point to be measured, move the trackball.
6. To complete the measurement, press “Enter”. The system displays the vertical distance between the two points in the results window.

Single Slope Measurement:

- D-E Excursion
- D-E Slope
- E-F Slope

To execute the slope measurement, the steps are as follows:

-
1. Press "Measure".
 2. Select the slope measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
 3. To position the active caliper at the start point to be measured, move the trackball.
 4. To fix the start point, press "Enter". The system fixes the first caliper and displays a second active caliper.
 5. To position the second caliper at the end point to be measured, move the trackball.
 6. To complete the measurement, press "Enter". The system displays the slope, vertical distance and horizontal time interval between the two points in the results window.

- A/B Ratio(Slope)
- MV E/A Ratio
 - MV Vel A
 - MV Vel E

To measure A/B Ratio(Slope), the steps are as follows:

1. Press "Measure".
2. Select MV E/A Ratio, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the velocity A, move the trackball.
4. To fix the velocity A, press "Enter". The system fixes the first caliper and displays a second active caliper.
5. To position the velocity B, move the trackball.
6. To complete the measurement, press "Enter" to fix the velocity B. The system displays the velocity A, velocity B and velocity A/velocity B ratio in the results window.

In the "PW" mode of Cardiac examination, the MV Measurement Folder includes the following measurements:

Single Velocity Measurement:

- MR Vmax
- MV Vmax
- MV Vel E
- MV Vel A

To execute the velocity measurement, the steps are as follows:

1. Press "Measure".
2. Select the velocity measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the caliper at the desired measurement point, move the trackball.
4. To complete the measurement, press "Enter". The system displays the

velocity measurement in the results window.

Double Velocity Measurement:

- MR Max PG
 - Vmax1
 - Vmax2
- MV Max PG
 - Vmax1
 - Vmax2
- MV E/A Ratio
 - MV Vel A
- MV Vel E

To execute the two velocity measurements, the steps are as follows:

1. Press “Measure”.
2. Select the double velocity measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the caliper at the desired measurement point, move the trackball.
4. To complete the first velocity measurement, press “Enter”. The system displays the first velocity measurement in the results window, and a second active caliper with a vertical and horizontal dotted line displays.
5. To position the caliper at the desired measurement point, move the trackball.
6. To complete the second velocity measurement, press “Enter”. The system displays the second velocity measurement and Max PG or velocity ratio in the results window.

Single Time Interval Measurement:

- MV Acc Time
- MV Dec Time
- MVET
- MV A Dur
- MV TTP
- MV E Dur

To execute the time interval measurement, the steps are as follows:

1. Press “Measure”.
2. Select the time measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the caliper at the start point, move the trackball.
4. To fix the first caliper, press “Enter”. The system fixes the first caliper and displays a second active caliper.
5. To position the second caliper at the end point, move the trackball.
6. To complete the measurement, press “Enter”. The system displays the

horizontal time interval between the two calipers in the results window.

Single Slope Measurement:

- MR Acc
- MV Acc
- MV Dec
- MV PHT
- MPA by PHT

To execute the slope measurement, the steps are as follows:

1. Press "Measure".
2. Select the slope measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the active caliper at the start point to be measured, move the trackball.
4. To fix the start point, press "Enter". The system fixes the first caliper and displays a second active caliper.
5. To position the second caliper at the end point to be measured, move the trackball.
6. To complete the measurement, press "Enter". The system displays the slope, two velocities and horizontal time interval between the two points in the results window.

Single Trace Measurement:

- MR Trace
- MV Trace

To execute the trace measurement, the steps are as follows:

1. Press "Measure".
2. Select the trace measurement to be executed, an active trace caliper displays.
3. To fix the start point, press "Enter".
4. To trace the velocities of the desired portion of the spectrum, move the Trackball.

Note: To re-edit the existing trace line, press "Clear" once and move the trackball again.

5. To complete the measurement, press "Enter". The system displays the measurement values in the results window.

To configure the trace measurement:

Configure the single trace measurement to define the parameter that needs to be calculated and displayed in the Results Window.

1. Press "Measure".
2. Select "Config" then select "MR Trace or MV Trace" button, and a menu displays.

3. Choose the measurement to be executed.

Multiple Time Interval Measurement:

LV TEI MPI

- MV C-O dur
- LVET

To execute the time interval measurement, the steps are as follows:

1. Press "Measure".
2. Select "LV TEI MPI" to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the caliper at the start point, move the trackball.
4. To fix the first caliper, press "Enter". The system fixes the first caliper and displays a second active caliper.
5. To position the second caliper at the end point, move the trackball.
6. To complete the measurement, press "Enter". The system displays the horizontal time interval between the two calipers in the results window.

Cardiac Aortic Measurement Folder

In "B" mode of Cardiac examination, the "Ao" Measurement Folder includes measurements as follows:

Single Distance Measurement:

- Ao Diam
- Ao Arch Diam
- Ao AscDiam
- Ao DescDiam
- Ao Isthmus
- Ao ST Junct

To execute the single distance measurement, the steps are as follows:

1. Press "Measure".
2. Select the distance measurement to be executed, and an active tracing caliper displays on the image screen
3. To position the active caliper at the start point, move the trackball.
4. To fix the start point, press "Enter". The system fixes the first caliper and displays a second active caliper.
5. To position the second active caliper at the end point, move the Trackball. A dotted line connects the measurement points, if preset accordingly.
6. To complete the measurement, press "Enter". The system displays the distance value in the results window.

In "M" mode of Cardiac examination, the "Ao" Measurement Folder includes the following measurements:

Single Distance Measurement:

- Ao Diam

To execute the single distance measurement, the steps are as follows:

1. Press "Measure".
2. Select the distance measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the active caliper at the most anterior point to be measured, move the trackball.
4. To fix the start point, press "Enter". The system fixes the first caliper and displays a second active caliper.
5. To position the second caliper at the most posterior point to be measured, move the Trackball.
6. To complete the measurement, press "Enter". The system displays the vertical distance between the two points in the results window.

In "PW" mode of Cardiac examination, the "Ao" Measurement Folder includes measurements as follows:

Single Velocity Measurement:

- AR Vmax
- AREnd Vmax
- Coarc Pre-Dust
- Coarc Post-Dust

To execute the velocity measurement, the steps are as follows:

1. Press "Measure".
2. Select the velocity measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the caliper at the desired measurement point, move the trackball.
4. To complete the measurement, press "Enter". The system displays the velocity measurement in the results window.

Double Velocity Measurement:

- AR Max PG
 - Vmax1
 - Vmax2

To execute the two velocity measurements, the steps are as follows:

1. Press "Measure".
2. Select the double velocity measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the caliper at the desired measurement point, move the Trackball.
4. To complete the first velocity measurement, press "Enter". The system displays the first velocity measurement in the results window, and a second active caliper with a vertical and horizontal dotted line displays.

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5. To position the caliper at the desired measurement point, move the trackball.
 6. To complete the second velocity measurement, press "Enter". The system displays the second velocity measurement and Max PG in the results window.

Single Slope Measurement:

- AR PHT

To execute the slope measurement, the steps are as follows:

1. Press "Measure".
2. Select the slope measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the active caliper at the start point to be measured, move the trackball.
4. To fix the start point, press "Enter". The system fixes the first caliper and displays a second active caliper.
5. To position the second caliper at the end point to be measured, move the trackball.
6. To complete the measurement, press "Enter". The system displays the slope, two velocities and horizontal time interval between the two points in the results window.

Single Trace Measurement:

- AR Trace

To execute the trace measurement, the steps are as follows:

1. Press "Measure".
2. Select the trace measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To fix the start point, press "Enter".
4. To trace the velocities of the desired portion of the spectrum, move the trackball.

Note: To re-edit the existing trace line, press Clear once and move the trackball again.

5. To complete the measurement, press "Enter". The system displays the measurement values in the results window.

To configure the trace measurement:

Configure the single trace measurement to define the parameter that needs to be calculated and displayed in the Results Window.

1. Press "Measure".
2. Select "Config" then select "AR Trace" button, and a menu displays.
3. Choose the measurement to be executed.

Cardiac Aortic Valve(AV) Measurement Folder

In the B mode of Cardiac examination, the AV Measurement Folder includes the following measurements:

Single Distance Measurement:

- AV Diam
- AV Cusp
- AR Radius(only available in the CFI mode)

To execute the single distance measurement, the steps are as follows:

1. Press "Measure".
2. Select the distance measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the active caliper at the start point, move the trackball.
4. To fix the start point, press "Enter". The system fixes the first caliper and displays a second active caliper.
5. To position the second active caliper at the end point, move the Trackball. A dotted line connects the measurement points, if preset accordingly.
6. To complete the measurement, press "Enter". The system displays the distance value in the results window.

Area Measurement, and the measurement method option can be Polygon, Spline and Trace, where Trace method is the default setting.

- AVA
- AV-A
- Trans AVAd
- Trans AVAs

To execute the area measurement by Trace method, the steps are as follows:

1. Press "Measure".
2. Select the area measurement to be executed.
3. Select the measurement method Trace as the default setting from the configuration menu, and an active tracing caliper displays.
4. To position the trace caliper, move the trackball.
5. To fix the trace start point, press "Enter". The system fixes the first caliper and the trace caliper changes to an active tracing caliper.
6. To trace the measurement area, move the trackball around the anatomy.
7. To complete the measurement, press "Enter". The system displays the measured area value in the results window.

Note:

Before completing the spline measurement:

- To erase the line (little by little) back from its current point, press "Clear" once;
- To clear the trace caliper and the current data measured, press "Clear" for at least 2 seconds.

In the M mode of Cardiac examination, the AV Measurement Folder includes the following measurements:

Single Distance Measurement:

- AV Cusp

To execute the single distance measurement, the steps are as follows:

1. Press "Measure".
2. Select the distance measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the active caliper at the most anterior point to be measured, move the trackball.
4. To fix the start point, press "Enter". The system fixes the first caliper and displays a second active caliper.
5. To position the second caliper at the most posterior point to be measured, move the trackball.
6. To complete the measurement, press "Enter". The system displays the vertical distance between the two points in the results window.

In "PW" mode of Cardiac examination, the AV Measurement Folder includes measurements as follows:

Single Velocity Measurement:

- AV Vmax

To execute the velocity measurement, the steps are as follows:

1. Press "Measure".
2. Select the velocity measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the caliper at the desired measurement point, move the trackball.
4. To complete the measurement, press "Enter". The system displays the velocity measurement in the results window.

Double Velocity Measurement:

- AV Max PG
 - Vmax1
 - Vmax2

To execute the two velocity measurements, the steps are as follows:

1. Press "Measure".
2. Select the double velocity measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the caliper at the desired measurement point, move the trackball.
4. To complete the first velocity measurement, press "Enter". The system displays the first velocity measurement in the Results Window, and a second

active caliper with a vertical and horizontal dotted line displays.

5. To position the caliper at the desired measurement point, move the trackball.
6. To complete the second velocity measurement, press "Enter". The system displays the second velocity measurement and Max PG in the results window.

Single Time Interval Measurement:

- AV Acc Time
- AV Dec Time
- AVET
- AVHR

To execute the time interval measurement, the steps are as follows:

1. Press "Measure".
2. Select the time measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the caliper at the start point, move the Trackball.
4. To fix the first caliper, press "Enter". The system fixes the first caliper and displays a second active caliper.
5. To position the second caliper at the end point, move the trackball.
6. To complete the measurement, press "Enter". The system displays the horizontal time interval between the two calipers in the Results Window.

A/B Ratio (Time) Measurement:

- AV Ratio
- AV Acc Time
- AVET

To measure AV Ratio, the steps are as follows:

1. Press "Measure".
2. Select "AV Ratio", a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. Perform two standard time interval measurements on AV Acc Time and AVET.
4. The system displays AV Acc Time, AVET and AV Acc Time/AVET Ratio in the results window.

Single Slope Measurement:

- AV Acc
- AV Dec
- AVA by PHT

To execute the slope measurement, the steps are as follows:

1. Press "Measure".
2. Select the slope measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.

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3. To position the active caliper at the start point to be measured, move the trackball.
 4. To fix the start point, press “Enter”. The system fixes the first caliper and displays a second active caliper.
 5. To position the second caliper at the end point to be measured, move the trackball.
 6. To complete the measurement, press “Enter”. The system displays the slope, two velocities and horizontal time interval between the two points in the results window.

Single Trace Measurement:

- AV Trace

To execute the trace measurement, the steps are as follows:

1. Press “Measure”.
2. Select the trace measurement to be executed, an active trace caliper displays.
3. To fix the start point, press “Enter”.
4. To trace the velocities of the desired portion of the spectrum, move the trackball.

Note: To re-edit the existing trace line, press Clear once and move the trackball again.

5. To complete the measurement, press “Enter”. The system displays the measurement values in the results window.

To configure the trace measurement:

Configure the single trace measurement to define the parameter that needs to be calculated and displayed in the results window.

1. Press “Measure”.
2. Select “Config” then select “AV Trace” button, and a menu displays.
3. Choose the measurement to be executed.

Cardiac Left Atrium(LA) Measurement Folder

In the B mode of Cardiac examination, the LA Measurement Folder includes the following measurements:

Single Distance Measurement:

- LA Diam
- LAd Major
- LAd Minor
- LAs Major
- LAs Minor

To execute the single distance measurement, the steps are as follows:

1. Press “Measure”.
2. Select the distance measurement to be executed, and an active tracing caliper

displays.

3. To position the active caliper at the start point, move the trackball.
4. To fix the start point, press “Enter”. The system fixes the first caliper and displays a second active caliper.
5. To position the second active caliper at the end point, move the Trackball. A dotted line connects the measurement points, if preset accordingly.
6. To complete the measurement, press “Enter”. The system displays the distance value in the results window.

Area Measurement, and the measurement method option can be Polygon, Spline and Trace, where Trace method is the default setting.

- LAAd
- LAAs

To execute the area measurement by Trace method, the steps are as follows:

1. Press “Measure”.
2. Select the area measurement to be executed.
3. Select the measurement method Trace as the default setting from the configuration menu, and an active tracing caliper displays.
4. To position the trace caliper, move the trackball.
5. To fix the trace start point, press “Enter”. The system fixes the first caliper and the trace caliper changes to an active tracing caliper.
6. To trace the measurement area, move the trackball around the anatomy.
7. To complete the measurement, press “Enter”. The system displays the measured area value in the results window.

Note:

Before completing the spline measurement:

- To erase the line (little by little) back from its current point, press “Clear” once;
- To clear the trace caliper and the current data measured, press “Clear” for at least 2 seconds.

Single Trace combined with Single Distance Measurement:

- Diastolic Period: A2C LAEDV, A4C LAEDV
- Systolic Period: A2C LAESV, A4C LAESV

In the M mode of Cardiac examination, the LA Measurement Folder includes the following measurements:

Single Distance Measurement:

- LA Diam

To execute the single distance measurement, the steps are as follows:

1. Press “Measure”.
2. Select the distance measurement to be executed, a vertical and horizontal

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- dotted line and an active tracing caliper will display on the image screen.
3. To position the active caliper at the most anterior point to be measured, move the trackball.
 4. To fix the start point, press "Enter". The system fixes the first caliper and displays a second active caliper.
 5. To position the second caliper at the most posterior point to be measured, move the trackball.
 6. To complete the measurement, press "Enter". The system displays the vertical distance between the two points in the results window.

A/B Ratio(Diam) Measurement:

- LA/Ao
- LA Diam
- Ao Diam

To measure LA/Ao, the steps are as follows:

1. Press "Measure".
2. Select "LA/Ao", a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. Perform two standard distance measurements on LA Diam and Ao Diam.
4. The system displays LA Diam, Ao Diam and LA Diam/Ao Diam Ration in the results window.

Cardiac Right Ventricular(RV) Measurement Folder

In the B mode of Cardiac examination, the RV Measurement Folder includes the following measurements:

Single Distance Measurement:

- RVAWd
- RVIDd
- RVAWs
- RVIDs
- RVd Major
- RVd Minor
- RVs Major
- RVs Minor
- RVOT Diam
- LPA Diam
- RPA Diam
- MPA Diam

To execute the single distance measurement, the steps are as follows:

1. Press "Measure".
2. Select the distance measurement to be executed, and an active tracing caliper displays.
3. To position the active caliper at the start point, move the trackball.

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4. To fix the start point, press “Enter”. The system fixes the first caliper and displays a second active caliper.
 5. To position the second active caliper at the end point, move the trackball. A dotted line connects the measurement points, if preset accordingly.
 6. To complete the measurement, press “Enter”. The system displays the distance value in the results window.

Area Measurement, and the measurement method option can be Polygon, Spline and Trace, where Trace method is the default setting.

- RVAd
- RVAs
- LPAA
- RPAA

To execute the area measurement by Trace method, the steps are as follows:

1. Press “Measure”.
2. Select the area measurement to be executed.
3. Select the measurement method “Trace” as the default setting from the configuration menu, and an active tracing caliper displays.
4. To position the trace caliper, move the trackball.
5. To fix the trace start point, press “Enter”. The system fixes the first caliper and the trace caliper changes to an active tracing caliper.
6. To trace the measurement area, move the Trackball around the anatomy.
7. To complete the measurement, press “Enter”. The system displays the measured area value in the results window.

Note:

Before completing the spline measurement:

- To erase the line (little by little) back from its current point, press “Clear” once;
- To clear the trace caliper and the current data measured, press “Clear” for at least 2 seconds.

In the M mode of Cardiac examination, the RV Measurement Folder includes the following measurements:

Single Distance Measurement:

- RVAWd
- RVIDd
- RVAWs
- RVIDs

To execute the single distance measurement, the steps are as follows:

1. Press “Measure”.
2. Select the distance measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.

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3. To position the active caliper at the most anterior point to be measured, move the trackball.
 4. To fix the start point, press “Enter”. The system fixes the first caliper and displays a second active caliper.
 5. To position the second caliper at the most posterior point to be measured, move the trackball.
 6. To complete the measurement, press “Enter”. The system displays the vertical distance between the two points in the results window.

Double Distance Measurement:

- RV Study
- RVIDd
- RVIDs

To complete the RV Study measurement, perform the two standard distance measurements continuously.

Single Time Interval Measurement:

- RVPEP
- RVET

To execute the time interval measurement, the steps are as follows:

1. Press “Measure”.
2. Select the time measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the caliper at the start point, move the trackball.
4. To fix the first caliper, press “Enter”. The system fixes the first caliper and displays a second active caliper.
5. To position the second caliper at the end point, move the trackball.
6. To complete the measurement, press “Enter”. The system displays the horizontal time interval between the two calipers in the results window.

In the “PW” mode of Cardiac examination, the RV Measurement Folder includes the following measurements:

Single Velocity Measurement:

- RVOT Vmax

To execute the velocity measurement, the steps are as follows:

1. Press “Measure”.
2. Select the velocity measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the caliper at the desired measurement point, move the trackball.
4. To complete the measurement, press “Enter”. The system displays the velocity measurement in the results window.

Double Velocity Measurement:

- RVOT Max PG
 - Vmax1
 - Vmax2

To execute the two velocity measurements, the steps are as follows:

1. Press "Measure".
2. Select the double velocity measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the caliper at the desired measurement point, move the trackball.
4. To complete the first velocity measurement, press "Enter". The system displays the first velocity measurement in the results window, and a second active caliper with a vertical and horizontal dotted line displays.
5. To position the caliper at the desired measurement point, move the trackball.
6. To complete the second velocity measurement, press "Enter". The system displays the second velocity measurement and Max PG in the results window.

Single Time Interval Measurement:

- RVET

To execute the time interval measurement, the steps are as follows:

1. Press "Measure".
2. Select the time measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the caliper at the start point, move the Trackball.
4. To fix the first caliper, press "Enter". The system fixes the first caliper and displays a second active caliper.
5. To position the second caliper at the end point, move the trackball.
6. To complete the measurement, press "Enter". The system displays the horizontal time interval between the two calipers in the results window.

Single Trace Measurement:

- RVOT Trace

To execute the trace measurement, the steps are as follows:

1. Press "Measure".
2. Select the trace measurement to be executed, an active trace caliper displays.
3. To fix the start point, press "Enter".
4. To trace the velocities of the desired portion of the spectrum, move the trackball.

Note: To re-edit the existing trace line, press "Clear" once and move the trackball again.

5. To complete the measurement, press "Enter". The system displays the

measurement values in the results window.

To configure the trace measurement:

Configure the single trace measurement to define the parameter that needs to be calculated and displayed in the Results Window.

1. Press "Measure".
2. Select "Config" then select "RVOT Trace" button, and a menu displays.
3. Choose the measurement to be executed.

Single Trace combined with Single Distance Measurement:

- SV (Stroke Volume)
 - SV Diam
 - SV TAMEAN

To measure SV, the steps are as follows:

1. Press "Measure".
2. Select "SV".
3. Select "SV Diam", and perform the single distance measurement.
4. Select "SV TAMEAN", and perform the single trace measurement.
5. The system displays measurement values in the results window.
6. If there is HR measurement result or get HR from ECG, the system will calculate CO and CI.

Cardiac Tricuspid Valve(TV) Measurement Folder

In the B mode of Cardiac examination, the TV Measurement Folder includes the following measurements:

Single Distance Measurement:

TV Ann Diam

- TR Radius (only available in CFI mode)

To execute the single distance measurement, the steps are as follows:

1. Press "Measure".
2. Select the distance measurement to be executed, and an active tracing caliper displays.
3. To position the active caliper at the start point, move the trackball.
4. To fix the start point, press "Enter". The system fixes the first caliper and displays a second active caliper.
5. To position the second active caliper at the end point, move the Trackball. A dotted line connects the measurement points, if preset accordingly.
6. To complete the measurement, press "Enter". The system displays the distance value in the results window.

Area Measurement

The measurement method options are Polygon, Spline and Trace. Trace method

is the default setting.

- TVA

To execute the area measurement by Trace method, the steps are as follows:

1. Press "Measure".
2. Select the area measurement to be executed.
3. Select the measurement method Trace as the default setting from the configuration menu, and an active tracing caliper displays.
4. To position the trace caliper, move the trackball.
5. To fix the trace start point, press "Enter". The system fixes the first caliper and the trace caliper changes to an active tracing caliper.
6. To trace the measurement area, move the trackball around the anatomy.
7. To complete the measurement, press "Enter". The system displays the measured area value in the results window.

Note:

Before completing the spline measurement,

- To erase the line (little by little) back from its current point, press "Clear" once;
- To clear the trace caliper and the current data measured, press "Clear" for at least 2 seconds.

In the M mode of Cardiac examination, the TV Measurement Folder includes the following measurements:

Single Time Interval Measurement:

- Q-to-TV close

To execute the time interval measurement, the steps are as follows:

1. Press "Measure".
2. Select the time measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the caliper at the start point, move the trackball.
4. To fix the first caliper, press "Enter". The system fixes the first caliper and displays a second active caliper.
5. To position the second caliper at the end point, move the trackball.
6. To complete the measurement, press "Enter". The system displays the horizontal time interval between the two calipers in the results window.

In the PW mode of Cardiac examination, the TV Measurement Folder includes the following measurements:

Single Velocity Measurement:

- TR Vmax
- TV Vmax

To execute the velocity measurement, the steps are as follows:

-
1. Press "Measure".
 2. Select the velocity measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
 3. To position the caliper at the desired measurement point, move the trackball.
 4. To complete the measurement, press "Enter". The system displays the velocity measurement in the results window.

Double Velocity Measurement:

- TR Max PG
 - Vmax1
 - Vmax2
- TV Max PG
 - Vmax1
 - Vmax2
- TV E/A Ratio
 - MV Vel A
 - MV Vel E

To execute the two velocity measurements, the steps are as follows:

1. Press "Measure".
2. Select the double velocity measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the caliper at the desired measurement point, move the trackball.
4. To complete the first velocity measurement, press "Enter". The system displays the first velocity measurement in the results window, and a second active caliper with a vertical and horizontal dotted line displays.
5. To position the caliper at the desired measurement point, move the trackball.
6. To complete the second velocity measurement, press "Enter". The system displays the second velocity measurement and Max PG or TV E/A Ratio in the results window.

Single Time Interval Measurement:

- TCO
- TV TTP
- TV A Dur
- Q-to-TV close

To execute the time interval measurement, the steps are as follows:

1. Press "Measure".
2. Select the time measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the caliper at the start point, move the trackball.
4. To fix the first caliper, press "Enter". The system fixes the first caliper and

displays a second active caliper.

5. To position the second caliper at the end point, move the trackball.
6. To complete the measurement, press "Enter". The system displays the horizontal time interval between the two calipers in the results window.

Multiple Time Interval Measurement:

RV TEI Index

- TV C-O dur
- RVET

To execute the time interval measurement, the steps are as follows:

1. Press "Measure".
2. Select "RV TEI Index" to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the caliper at the start point, move the trackball.
4. To fix the first caliper, press "Enter". The system fixes the first caliper and displays a second active caliper.
5. To position the second caliper at the end point, move the trackball.
6. To complete the measurement, press "Enter". The system displays the horizontal time interval between the two calipers in the results window.

Single Slope Measurement:

- TR Acc
- TV PHT

To execute the slope measurement, the steps are as follows:

1. Press "Measure".
2. Select the slope measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the active caliper at the start point to be measured, move the trackball.
4. To fix the start point, press "Enter". The system fixes the first caliper and displays a second active caliper.
5. To position the second caliper at the end point to be measured, move the trackball.
6. To complete the measurement, press "Enter". The system displays the slope, two velocities and horizontal time interval between the two points in the results window.

Single Trace Measurement:

- TR Trace
- TV Trace

To execute the trace measurement, the steps are as follows:

1. Press "Measure".

-
2. Select the trace measurement to be executed, an active trace caliper displays.
 3. To fix the start point, press “Enter”.
 4. To trace the velocities of the desired portion of the spectrum, move the trackball.
- Note: To re-edit the existing trace line, press Clear once and move the trackball again.
5. To complete the measurement, press “Enter”. The system displays the measurement values in the results window.

To configure the trace measurement:

Configure the single trace measurement to define the parameter that needs to be calculated and displayed in the results window.

1. Press “Measure”.
2. Select “Config” then select “TR Trace” or “TV Trace” button, and a menu displays.
3. Choose the measurement to be executed.

Single Trace combined with Single Distance Measurement:

- SV (Stroke Volume)
 - SV Diam
 - SV TAMEAN

To measure SV, the steps are as follows:

1. Press “Measure”.
2. Select “SV”.
3. Select “SV Diam”, and perform the single distance measurement.
4. Select “SV TAMEAN”, and perform the single trace measurement.
5. The system displays measurement values in the results window.
6. If there is HR measurement result or get HR from ECG, the system will calculate CO and CI.

Cardiac Pulmonary Valve(PV) Measurement Folder

In the B mode of Cardiac examination, the PV Measurement Folder includes the following measurements:

Single Distance Measurement:

- Pulmonic Diam
- PV Ann Diam
- PR Radius (only available in the CF mode)

To execute the single distance measurement, the steps are as follows:

1. Press “Measure”.
2. Select the distance measurement to be executed, and an active tracing caliper displays.
3. To position the active caliper at the start point, move the trackball.

-
4. To fix the start point, press “Enter”. The system fixes the first caliper and displays a second active caliper.
 5. To position the second active caliper at the end point, move the trackball. A dotted line connects the measurement points, if preset accordingly.
 6. To complete the measurement, press “Enter”. The system displays the distance value in the results window.

Area Measurement

The measurement method options are Polygon, Spline and Trace, where Trace method is the default setting.

- PVA
- PV-A

To execute the area measurement by Trace method, the steps are as follows:

1. Press “Measure”.
2. Select the area measurement to be executed.
3. Select the measurement method Trace as the default setting from the configuration menu, and an active tracing caliper displays.
4. To position the trace caliper, move the trackball.
5. To fix the trace start point, press “Enter”. The system fixes the first caliper and the trace caliper changes to an active tracing caliper.
6. To trace the measurement area, move the trackball around the anatomy.
7. To complete the measurement, press “Enter”. The system displays the measured area value in the results window.

Note:

Before completing the spline measurement:

- To erase the line (little by little) back from its current point, press “Clear” once;
- To clear the trace caliper and the current data measured, press “Clear” for at least 2 seconds.

In the M mode of Cardiac examination, the PV Measurement Folder includes the following measurements:

Single Time Interval Measurement:

- Q-to-PV close

To execute the time interval measurement, the steps are as follows:

1. Press “Measure”.
2. Select the time measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the caliper at the start point, move the trackball.
4. To fix the first caliper, press “Enter”. The system fixes the first caliper and displays a second active caliper.
5. To position the second caliper at the end point, move the trackball.

6. To complete the measurement, press “Enter”. The system displays the horizontal time interval between the two calipers in the results window.

In the PW mode of Cardiac examination, the PV Measurement Folder includes the following measurements:

Single Velocity Measurement:

- PR Vmax
- PReEnd Vmax
- PV Vmax

To execute the velocity measurement, the steps are as follows:

1. Press “Measure”.
2. Select the velocity measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the caliper at the desired measurement point, move the trackball.
4. To complete the measurement, press “Enter”. The system displays the velocity measurement in the results window.

Double Velocity Measurement:

- PR Max PG
 - Vmax1
 - Vmax2
- PReEnd Max PG
 - Vmax1
 - Vmax2
- PV Max PG
 - Vmax1
 - Vmax2

To execute the two velocity measurements, the steps are as follows:

1. Press “Measure”.
2. Select the double velocity measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the caliper at the desired measurement point, move the trackball.
4. To complete the first velocity measurement, press “Enter”. The system displays the first velocity measurement in the results window, and a second active caliper with a vertical and horizontal dotted line displays.
5. To position the caliper at the desired measurement point, move the trackball.
6. To complete the second velocity measurement, press “Enter”. The system displays the second velocity measurement and Max PG in the results window.

Single Time Interval Measurement:

- PV Acc Time

-
- PV Dec Time
 - PVET
 - Q-to-PV close

To execute the time interval measurement, the steps are as follows:

1. Press "Measure".
2. Select the time measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the caliper at the start point, move the trackball.
4. To fix the first caliper, press "Enter". The system fixes the first caliper and displays a second active caliper.
5. To position the second caliper at the end point, move the trackball.
6. To complete the measurement, press "Enter". The system displays the horizontal time interval between the two calipers in the results window.

A/B Ratio (Time) Measurement:

- PV Ratio
- PV Acc Time
- PVET

To measure PV Ratio, the steps are as follows:

1. Press "Measure".
2. Select "PV Ratio", a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. Perform two standard time interval measurements on PV Acc Time and PVET.
4. The system displays PV Acc Time, PVET and PV Acc Time/PVET Ratio in the results window.

Single Slope Measurement:

- PR Acc
- PR PHT
- PV Acc

To execute the slope measurement, the steps are as follows:

1. Press "Measure".
2. Select the slope measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the active caliper at the start point to be measured, move the trackball.
4. To fix the start point, press "Enter". The system fixes the first caliper and displays a second active caliper.
5. To position the second caliper at the end point to be measured, move the trackball.
6. To complete the measurement, press "Enter". The system displays the slope,

two velocities and horizontal time interval between the two points in the results window.

Single Trace Measurement:

- PAEDP
- PR Trace
- PV Trace

To execute the trace measurement, the steps are as follows:

1. Press "Measure".
2. Select the trace measurement to be executed, an active trace caliper displays.
3. To fix the start point, press "Enter".
4. To trace the velocities of the desired portion of the spectrum, move the trackball.

Note: To re-edit the existing trace line, press Clear once and move the trackball again.

5. To complete the measurement, press "Enter". The system displays the measurement values in the results window.

To configure the trace measurement:

Configure the single trace measurement to define the parameter that needs to be calculated and displayed in the results window.

1. Press "Measure".
2. Select "Config" then select "PR Trace" or "PV Trace" button, and a menu displays.
3. Choose the measurement to be executed.

Cardiac Right Atrium(RA) Measurement Folder

In the B mode of Cardiac examination, the RA Measurement Folder includes the following measurements:

Single Distance Measurement:

- RAd Major
- RAd Minor
- RAs Major
- RAs Minor

To execute the single distance measurement, the steps are as follows:

1. Press "Measure".
2. Select the distance measurement to be executed, and an active tracing caliper displays.
3. To position the active caliper at the start point, move the trackball.
4. To fix the start point, press "Enter". The system fixes the first caliper and displays a second active caliper.
5. To position the second active caliper at the end point, move the trackball. A

dotted line connects the measurement points, if preset accordingly.

6. To complete the measurement, press “Enter”. The system displays the distance value in the results window.

Area Measurement, and the measurement method option can be Polygon, Spline and Trace, where Trace method is the default setting.

- RAAAd
- RAAs

To execute the area measurement by Trace method, the steps are as follows:

1. Press “Measure”.
2. Select the area measurement to be executed.
3. Select the measurement method Trace as the default setting from the configuration menu, and an active tracing caliper displays.
4. To position the trace caliper, move the trackball.
5. To fix the trace start point, press “Enter”. The system fixes the first caliper and the trace caliper changes to an active tracing caliper.
6. To trace the measurement area, move the trackball around the anatomy.
7. To complete the measurement, press “Enter”. The system displays the measured area value in the results window.

Note:

Before completing the spline measurement:

- To erase the line (little by little) back from its current point, press “Clear” once;
- To clear the trace caliper and the current data measured, press “Clear” for at least 2 seconds.

Cardiac System Measurement Folder

In the B mode of Cardiac examination, the System Measurement Folder includes the following measurements:

Single Distance Measurement:

- IVC Diam
- Systemic Vein Diam
- PDA Diam
- PFO Diam
- VSD Diam
- ASD Diam
- PEd

To execute the single distance measurement, the steps are as follows:

1. Press “Measure”.
2. Select the distance measurement to be executed, and an active tracing caliper displays.
3. To position the active caliper at the start point, move the trackball.

-
4. To fix the start point, press “Enter”. The system fixes the first caliper and displays a second active caliper.
 5. To position the second active caliper at the end point, move the trackball. A dotted line connects the measurement points, if preset accordingly.
 6. To complete the measurement, press “Enter”. The system displays the distance value in the results window.

Multiple Distance Measurement:

- %IVS
 - IVSd
 - IVSs
- RV/LV
 - RVIDd
 - LVIDd
 - RVIDs
 - LVIDs

To complete the %IVS and RV/LV measurement, perform the multiple standard distance measurements continuously.

In the M mode of Cardiac examination, the System Measurement Folder includes the following measurements:

Single Distance Measurement:

- PEd

To execute the single distance measurement, the steps are as follows:

1. Press “Measure”.
2. Select the distance measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the active caliper at the most anterior point to be measured, move the trackball.
4. To fix the start point, press “Enter”. The system fixes the first caliper and displays a second active caliper.
5. To position the second caliper at the most posterior point to be measured, move the trackball.
6. To complete the measurement, press “Enter”. The system displays the vertical distance between the two points in the results window.

Multiple Distance Measurement:

- %IVS
 - IVSd
- IVSs
- RV/LV
 - RVIDd

-
- LVIDd
 - RVIDs
 - LVIDs

To complete the %IVS and RV/LV measurement, perform the multiple standard distance measurements continuously.

In the PW mode of Cardiac examination, the System Measurement Folder includes the following measurements:

Single Velocity Measurement:

- PVeinVel A
- PVeinVel S
- PVeinVel D
- PVeinVd
- PVeinVs
- Systemic Vein Vd
- Systemic Vein Vs
- VSD Vmax
- ASD Vmax

To execute the velocity measurement, the steps are as follows:

1. Press "Measure".
2. Select the velocity measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the caliper at the desired measurement point, move the trackball.
4. To complete the measurement, press "Enter". The system displays the velocity measurement in the results window.

Double Velocity Measurement:

- VSD Max PG
 - Vmax1
 - Vmax2
- PVein S/D Ratio
 - PVeinVel S
 - PVeinVel D

To execute the two velocity measurements, the steps are as follows:

1. Press "Measure".
2. Select the double velocity measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the caliper at the desired measurement point, move the trackball.
4. To complete the first velocity measurement, press the Enter key. The system displays the first velocity measurement in the results window, and a second

active caliper with a vertical and horizontal dotted line displays.

5. To position the caliper at the desired measurement point, move the trackball.
6. To complete the second velocity measurement, press "Enter". The system displays the second velocity measurement and VSD Max PG or PVein S/D Ratio in the results window.

Single Time Interval Measurement:

- PVein A Dur
- IVCT
- IVRT

To execute the time interval measurement, the steps are as follows:

1. Press "Measure".
2. Select the time measurement to be executed, a vertical and horizontal dotted line and an active tracing caliper will display on the image screen.
3. To position the caliper at the start point, move the trackball.
4. To fix the first caliper, press "Enter". The system fixes the first caliper and displays a second active caliper.
5. To position the second caliper at the end point, move the trackball.
6. To complete the measurement, press "Enter". The system displays the horizontal time interval between the two calipers in the results window.

Single Trace Measurement:

- PA VTI
- Systemic Vein VTI

To execute the trace measurement, the steps are as follows:

1. Press "Measure".
2. Select the trace measurement to be executed, an active trace caliper displays.
3. To fix the start point, press "Enter".
4. To trace the velocities of the desired portion of the spectrum, move the trackball.

Note: To re-edit the existing trace line, press "Clear" once and move the trackball again.

5. To complete the measurement, press "Enter". The system displays the measurement values in the results window.

Double Trace Measurement:

- Qp/Qs

To complete the Qp/Qs measurement, perform the two standard single trace measurements.

11 Probes and Biopsy

11.1 Probe overview

This device supports following types of probes

- Curved array (Convex)
- Linear array
- Phase array
- 4D probe
- Endocavity
- Intra-operative

11.2 Probes

Probe	Type	Illustration	Clinical Applicable Parts
G2-5C	Convex		Obstetrics/Fetal, gynecology, urology, abdomen, Pediatric
F2-5CE	Convex		Obstetrics/Fetal, gynecology, urology, abdomen, Pediatric
D3-6C	Volume Convex		Obstetrics/Fetal, gynecology, urology, abdomen
G4-9E	Endocavity		Obstetrics/Fetal, gynecology, urology
D4-9E	Volume Convex		Obstetrics/Fetal, gynecology, urology
F4-9E	Endocavity		Obstetrics/Fetal, gynecology, urology
G4-9M	Micro Convex		Pediatric, cardiac
I4-11T	Linear		Vascular, nerve, small parts, musculoskeletal, pediatric, vas. Access
I7-18L	Linear		Vascular, nerve, small parts, musculoskeletal, pediatric, vas.

			Access
U5-15LE	Linear		Vascular, nerve, small parts, musculoskeletal, pediatric, vas. Access
F4-12L	Linear		Vascular, nerve, small parts, musculoskeletal, pediatric, vas. Access
X4-12L	Linear		Vascular, nerve, small parts, musculoskeletal, pediatric, vas. Access
X6-16L	Linear		Vascular, nerve, small parts, musculoskeletal, pediatric, vas. Access
X9-22L	Linear		Vascular, nerve, small parts, musculoskeletal, pediatric, vas. Access
X10-23L	Linear		Vascular, nerve, small parts, musculoskeletal, pediatric, vas. Access
S1-6PS	Phased		Adult cardiac, pediatric cardiac, coronary, abdomen, TCD
G1-4P	Phased		Adult cardiac, pediatric cardiac, coronary, abdomen, TCD
G3-10P	Phased		Adult cardiac, pediatric cardiac, coronary, abdomen, TCD
G3-10PX	Phased		Adult cardiac, pediatric cardiac, coronary, abdomen, TCD

Probe orientation:

Each probe has one mark in one side of the probe head. This mark indicates the start point of scanning.

Probe Labeling:

Each probe is labeled with the following information:

- Name of manufacture
- Model name
- Probe serial number
- Year of manufacture
- Regulatory marks

11.3 Probe connection and disconnection

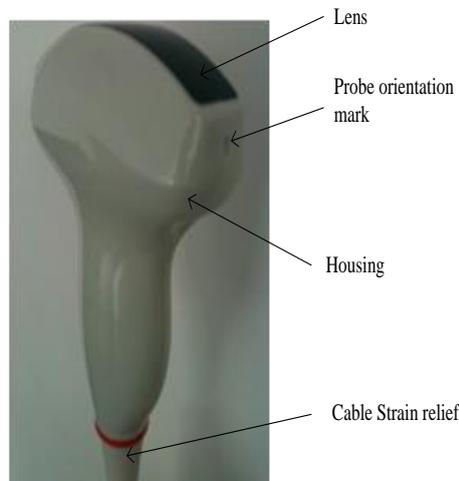
Only approved probes can be connected with this device. The probe can be connected or disconnected from the probe port at any time. When the probe is connected to this device, it is automatically detected.

After inserting the probe connector into this device, the operator needs to lock the probe by pressing the locker into the probe connector.

To disconnect the probe, the operator can push the locker and let the locker pop up for un-locking. Then pull the probe connector straight out of the probe port.

11.4 Biopsy

The data in the following list is the depth which is the distance between the surfaces with the cross point. The cross point is between the biopsy angle line and the center line for probes in this device. Cross point depth H can be referred the diagram as an example as shown below.



Unit: cm

Probes for Biopsies	Fixed Angle	Multiple Angles		
G2-5C		4.0	6.0	8.0
G4-9E(Steel, reusable)	Infinite			
X4-12L		2.0	4.0	6.0
X6-16L		1.5	2.5	3.5
G1-4P		4.0	5.5	8.0
S1-6P		4.0	5.5	8.0

12 System Setting

12.1 General

After “Sys Setting” in “B” mode main menu is selected, the system will enter the system settings menu. The default first entrance is “General”. In the display menu, the following items can be changed.

1) General

Hospital Information

- Edit hospital name, department and address.

Time & language

- Select time format by 12 hours or 24 hours, date format by Month-Day-Year, Year-Month-Day or Day-Month-Year.
- Select Date, Time Zone and Time. But the selected Time Zone is only effective after rebooting.
- Select which language will be used in the general. But the selected language is only effective after rebooting.

Patient/Exam

- Default New Patient UI: Local Data, Worklist.
- Patient ID prefix: Add prefix for patient ID.
- Patient Weight and Height Units: Metric Units, Imperial Units.
- Patient name format: First (Middle) Family, Family (Middle) First.
- Accession number Format: None, PatientID and IncrementNumber, ExamDate and IncrementNumber, Patient Name and IncrementNumber.
- Show patient birthday on image: Disabled, Enabled, Age (display age not birthday).

Store

- Auto Cine time span: 1-1500 seconds can be selected. The default value is 5 seconds, freeze the system during scanning, enable “Cine/Single” button, the latest 5 seconds will be replayed.
- Report printing ink saving: The stored image has no background after enabled this function.

Comments

- Comments fontsize: Set different fontsize for comments.
- Comments Retain After Unfreeze: Comments will not be cleared after

unfreeze the system if it is enabled.

- Auto open soft keyboard when edit a comment.
- Use “Common” comments as default: “Common” tab is selected when enter “Comments” if it is enabled.

Report Format Setting

- Report Format Options: Default、PDF、Doc、Csv.

2) Image Setting

Image Setting

- Automatically refresh tissue image when Doppler MDLine is moved: In PW/CW/TD mode, move MDLine, tissue image will be activated automatically for a while.
- 3D/4D Quick scan workflow: Switch to 4D after 3D data acquisition, start 4D scan automatically if this function is enabled. It also works when switch from 4D to 3D.
- Auto Duplex/Triplex: Duplex or triplex is enabled automatically when enter PW mode if this function is enabled.
- Flow/Doppler Max Steer Angle: 20°, 25°, 30°, change the max angle to steer linear image.
- Scan Image Rotation: Image can be rotated 90°/180°/270° if this item is enabled.
- 3D/4D use Depth Mapping: There is “Depth Mapping” in 3D/4D menu after enable this function. And the operator can enable/disable “Depth Mapping”.
- Zoom guide display: Display zoom guide on every reference image if this function is enabled.
- Enable Quick Steer function on B/HAR mode: Rotate “Rotation/Steer” key to steer linear image when this function is enabled.

CBI

- The Contrast Bubble type: default, typeA, typeB, typeC.

Biopsy

- Biopsy line type: Guide line, Parallel Region, Guideline And Tolerance Line.
- If select “Parallel Region”, user can select Biopsy Parallel Line Distance: 0.2, 0.3, 0.5, 0.8, 1, 1.5.
- Show Biopsy on first page: Enable it to display “Biopsy” button on the first page

More Settings

- Auto Optimization Mode:
 - Optimize Image: Only optimize image quality, parameters will not be adjusted.
 - Optimize parameters: Reset the value of TGC, Dynamic Range and Gain

-
- in B/HAR mode.
 - Optimize parameters and ROI: Reset the value of TGC, Dynamic Range and Gain in B/HAR mode or CF/PDI/TVI mode, and reset the size and position of ROI in CF/PDI/TVI mode.
 - Image Auto Level: The level is low, medium, high.
 - Auto Frequency: Change the frequency of modes automatically.
 - Auto Invert when steering on flow or Doppler.
 - Default state of SyncDisplay: If selecting “Enable”, when enter CF mode, it has two images on main screen, the left one is 2D image, the right one is 2D+CF image. If selecting “Disable”, when enter CF mode, it only has 2D+CF image.
 - Enable Pre Doppler Mode: “By pressing MDLine key”, “By pressing mode key”.
 - Select “By pressing MDLine key”: Pressing MDLine key, enter pre PW mode, “Sample Volume” can be adjusted. Press PW key, enter PW mode.
 - Select “By pressing mode key”: Pressing PW key, enter pre PW mode, “Sample Volume” can be adjusted. Pressing PW key again, enter PW mode. Pressing CW key, enter pre CW mode. Pressing CW key again, enter CW mode. Pressing TD key, enter pre TD mode, “Sample Volume” can be adjusted. Pressing TD key again, enter TD mode.
 - Full Screen: Enable it, set “Full Screen” as default.
 - Auto Sync ROI: When enable it, the system will automatically turn on Sync ROI mode.
 - Image Size Level: Large, Middle, Small.
 - Display auto trace line only within heart cycle: Display green auto trace line along the valid spectrum within cycles configured by “Heart Cycle”, if this item is enabled.

3) Input Setting

Input Setting

- Counterclockwise rotate to increase depth: Enable it, the depth will be increased when rotate “Depth” key counterclockwise.
- Caps Lock as default: Set “Caps” as default for Alphanumeric keyboard.
- Hide softkeyboard while using external keyboard: When plug in one external keyboard, the soft keyboard will not come out if it is enabled.
- Switch ‘Cursor’ and ‘Enter’ key: Enable it to switch the functions of ‘Cursor’ and ‘Enter’ key.
- Rotate factor of Gain knob: 1, 2, 5.
- Window open after freeze: Enter Measure when freeze the system, if select “Measure”. Enter Comments when freeze the system, if select “Comments”. Enter Body Pattern when freeze the system, if select “Body Pattern”. Just freeze the system if select “Do nothing”.
- Default Mouse Move Speed: 1-20

-
- Measure Mouse Move Speed: 1-20

4) Function Setting

ECG Setting

- Turn on ECG when start Stress Echo scan: ECG will be enabled automatically when enter Stress Echo after it is enabled.
- Auto enable ECG for Cardiac App: ECG will be enabled automatically when select cardiac application after it is enabled.
- ECG filter frequency: 50Hz, 60Hz.
- After “Show Manual” is selected, the operator manual will appear.

Stress Echo Setting

- Maximum Continuous Capture Time Span: 100-600.
- Score Model: Four Scores, Five Scores, Seven Scores.
- Segment Model: ASE16, ASE17.

Optional functions

- Play doppler audio for replayed doppler images: Play audio if it is enabled.
- Show tutorial control panel: Display “Tutorials” tab after enable it.
- PView Advanced Features: enable this item to activate zoom in/out and move functions in PView.
- Show TGC panel: enable this to show TGC on touch panel.
Hints: When show TGC panel is enabled, the TGC slider (on keyboard) will be not available.
- Segments & Applications configuration: General, MSK.
Hints: Set the probe applications, scan parameters, measurement and comment settings, ect.to apply to a specific segment. Select “General” to return to the factory default settings.

Power Saving

- Auto Freeze after a period of idle time (minutes): Never, 5, 10, 15, 30, 45, 60. 15 is the factory setting, if the system run 15 minutes with no operation, it will be frozen.
- Turn off the display while freezing automatically: Turn off the main screen and touch panel while the system freezing automatically. Press any key or touch the touch panel to activate the main screen and touch panel again.

5) UI Style

- UI Theme: there are two options, Ocean blue, Simple Dark. After reboot the system, the selected theme will be effective.
- Show Login Window: Enable it, the login window will appear when boot the system. Disable it, the system starts to scan at once when boot it.
- TGC bar Shown Temporally on Live Visual When TGC Adjust: Display one green line on the left of the image area to indicate TGC sliders’ position.

-
- Display Frequency range: Display every mode's frequency range if this item is enabled.
 - Show indicator on Application: After enabled "Simple UI", display indicator icon for applications if this item is enabled.
 - Image quick preview: Display preview window when the cursor is on the stored image on clipboard after enabled it.
 - Info window on Non-Main Monitor: Normal, Simple, Hide.
 - Show VAid Hint: The hints will appear during VAid Measure.
 - Customize user interface: Users can perform the following operations after enabled the feature:
 - Define a workflow, unit or steps, and then the machine will automatically run according to predefined steps.
 - Run/Ignore/Redo specific steps
 - Clone the factory sample and modify the unit/steps, or create new steps from stretch.

After changing settings, select "v" to save the information and exit from system setting menu. If selecting "Save", it will save current page information only without changing menu page. Select "X" to exit from the system setting menu without saving any information.

12.2 Monitor Tests

Select "Monitor Tests" on the top left side of the system setting menu to enter monitor testing menu. In this monitor tests menu, select the test pattern on the screen in order to test monitor quality, such as "Gradient-H", "Color Bands", "Response Time Ref", "Sub Pixel Font", "White", "Inversion All", "Response", "Sharpness D", "Black". Select "Exit Test" to exit monitor test, or 10 seconds later, it exits automatically.

12.3 Measurement

Enter "Sys Setting" menu, and select "Measure", then display setting items as follows:

1) Cursor

Cursor

- Cursor Type: "+" is the default factory setting for cursor type. Other cursor types can also be selected to replace the factory setting.
- Cursor and arrow cursor size: "16x16" is the factory setting. Other size can also be selected for cursor size.
- Cursor size when measure: "10x10" is factory setting. Other size can also be selected for shape cursor size.

More Settings

- Use Arrow Cursor for indication on image: Enable it and enable “Cursor”, there is an arrow on the image.
- Cursor color (M/D mode): Yellow, Lime. The color of the big cursor on PW/M image.
- Cursor line weight (M/D mode): Normal, Thin. The line weight of cursor can be changed by the setting.
- M mode distance caliper: HorizBeam, Cross.

2) Result Window Setting

Result Window Setting

- Show Result Window: During measurement, results are displayed in the results window with measurement number, and are updated simultaneously until complete. All results are displayed in the measurement results window. If necessary, this window can be hidden. Disable “Show RS.” button to hide the result window.
- Show Result Window Title: Enable this, the result’s title is displayed in front of the measurement results window. If necessary, this title also can be hidden.
- Result Window Position: The position of the measurement result window can be changed. To move the window, select the option from the list below:
 - Top Left
 - Bottom Left
 - Top Right
 - Bottom Right
- Font Size: To change the font size in the results window, select the size from the “Font Size” pull-down menu.
- Measure result position when not on main screen: Bottom right, Same as main screen.
- Measure result margin when not on main screen: 0, 1, 2, 3, 4.

More Settings

- Font color in normal state: Yellow, White, Lime. Yellow is the factory setting.
- Font color in focus state: Lime is the factory setting, other color can also be selected from the pull-down menu.
- Keep unfinished protocol item result after unfreeze: Retain, Clear. If select “Retain”, all measurement results of unfinished items are retained, if select “Clear”, all measurement results are cleared.
- Keep EFW dependent items’ results on result window after unfreeze: Clear, Retain. If select “Retain”, all results of EFW dependent items are retained, if select “Clear”, all results are cleared.
- Only clear the measurements on the active display segment unfreeze: The

measure results will not be cleared on the visual that is not active after unfreeze the system.

3) Display

Display

- Show Cursor line: During measurement, the system will display one dotted line to indicate measurement. After the position is selected when using touch panel measurement, the system will display measurement line "Enable" is selected for "Show cursor line". If "Disable" is selected, the system will erase the dotted line and only display the caliper with a number.
- Show depth guideline: Display a dotted line when do the measurement of "Depth". If the probe is linear and "TView" is disabled, the dotted is not needed.
- Show brief annotation: Enable it, display brief annotations when do the measurements.
- Annotation and Index font size for measurement line: To change the font size of the annotation, select the size from the "Annotation font size" pull-down menu.
- Show comment of measure items: Explain the measurement item in local language.
- Worksheet Statistic Method: Avg, Min, Max, Last.

Unit

- Unit for normal distance related measurement: cm, mm. Select different unit for normal distance measurement.
- Length measurement unit for high resolution probe: mm, cm, inch, ft. Select different unit for length measurement unit of high resolution probe.
- Length measurement unit for common linear probe: mm, cm, inch, ft. Select different unit for length measurement unit of common linear probe.
- Unit for area related measurement: m², cm², mm².
- Unit for velocity related measurement: m/s, cm/s, mm/s.
- Unit for time related measurement: s, ms.

More Settings

- Show result of protocol items in worksheet: If the current measurement is multi-step (like "Volume-L&W&H"), before finish the measurement, enter "Worksheet", this measurement item will be displayed. This function is disabled if select "off".
- Display measurement line when reviewing stored image: If this function is disabled, the system will erase the dotted line of all measurement when replay one image which contains measurements.
- Measure across multiple images: In dual or quad display format, the measure lines can across the image A and B or image C and D if this function is enabled. But the lines can not across the image A and C or image B and D.

-
- Show absolute value for velocity in doppler mode: No minus value of velocity if this function is enabled.
 - Synchronous Measurement For Sync Display: When enabled, cross-graph measurements can be made.
 - Auto select default measure item when enter measure: When enabled, click the measure key and the default measure item will be selected automatically.
Hints: When "Successive" feature is enabled, this setting will not take effect, and the last selected item will be auto selected when enter measure.
 - Measurement line color: Yellow, White, Lime. Yellow is the factory setting, other color can also be selected from the pull-down menu.
 - Auto adjust cursor size for tiny distance (px): If the distance is shorter than 10, 20, 30 or 50 pixels, the cursor size will become very small. This function is disabled if select "off".
 - Auto snap range for closed curve line(px): If the measurement method is "Trace", "Polygon" or "Spline", when the distance between the end point and the start point is shorter than 10, 20, 30 or 50 pixels, the measurement will finish automatically, and the last cursor back to the start point. This function is disabled if select "off".
 - Auto calculation mode: Not support, Support, Support(Only display latest calculation results).
 - Whether protocol measurements are repeated: Repeat Current, Not Repeat.

4) OB

OB Measure Global Config

- Show GA(LMP/BBT) on status bar: If there is GA(LMP/BBT) for the current patient, display it on the status bar.
- Show GA after Measure: During measurement, select whether or not to display the estimated fetal age automatically. If the fetal age is selected to be displayed in system set-up, the measurement results window will display estimated age after a measurement. If not, the estimated age will not be displayed in the results window.
- Show EDD after Measure: During measurement, select whether or not the estimated delivery time is displayed automatically after measurement. If estimated delivery time display is selected in the system setting, the estimated delivery time will appear in the results window after measurement. If not, estimated delivery time will not appear in the results window.
- Add 1 week to EDD Calac: If this item is selected, delivery time will be increased by 1 additional week.
- Show Percentile after Measure: Enable it, after finish the OB related measurement, show the percentile according to the OB table. LMP, BBT or

GA need to be input when create the current patient before do the measurement.

- Show EFW after Measure
- EFW Method: According to different areas select different methods.
- Unit for EFW: auto, g, kg, lb/oz. The unit of EFW is depended on the EFW method if “auto” is selected.
- GA Display Format: To change the display format for “GA” after enable “Show GA after measure”.

More Setting

- Auto Select EFW Method: Enable it, the system will select EFW method automatically when do EFW related measurements.
- Auto Generate Fetal Growth Curve Graph When Enter Report: Fetal growth curve graph will be generated automatically when enter report if this function is enabled.
- The processing method of FL and HL during VAim measurement: Always ask, Treat as FL and Treat as HL.

5) OB Tables

- User Defined OB Tables: User defined OB tables can be imported, deleted. Plug in one USB device, there is one file folder named “OBTables” in USB device, in the folder the file named “FG Table Template.csv” or “GA Table Template.csv” can be imported.
- OB Table Type: According to different area select different types.
- **OB Measure Item GA Table Config:** To configurate GA table for every measurement item.

Folder name and file name should be the same as the described above.

Table example:

Table Category	Measured Item	Author Name	Table Range	Measured Value Unit	GA Unit	SD Unit
GA	CRL	bbb	2	mm	day	day
Index	Measured Value	GA Min	GA Mean	GA Max	GA SD	
1	50		79		22	
2	55		82		22	
3	60		85		22	
4	65		89		22	
5	70		92		22	
⋮	⋮	⋮	⋮	⋮	⋮	⋮

12.4 Extended key

Printing and Save Keys in Control panel:

There are three keys on the right side of the control panel to start printing and saving functions. They are "Print", "Store to HDD" and "Store to USB" which are marked on the control panel. Here the HDD means the system's HDD which stores OS, application software, system setting and patient data. This section can configure those keys for following usage.

And "Foot Switch" can be configured too.



WARNING

The operator must make sure that USB memory stick is virus-free before connecting it with this device. Run a virus scan for USB memory stick in your computer before using.

The following functions can be configured into those three keys, 2 external foot switches.

If it is connected to double key foot switch, the foot switch on the left is configured with "External Foot Switch 1", and the foot switch on the right is configured with "External Foot Switch 2" by default.

If it is connected to single key foot switch, the foot switch is configured with "External Foot Switch 1" by default.

The functions can be configured are as follows:

- Print
 - Select "Details" to choose one printer if there is more than one printer connected.
 - Printer connected by USB (thermal printer or normal printer)
 - Printer connected by network: connect the network first, then add one network printer.
 - DICOM printer: connect the network first, then connect one DICOM printer.

Also "Display format" can be changed in "Details". Select the different display formats in pull-down menu.

If "Draw background" is enabled, draw black background when print images.

And "Paper size" and "Orientation" can be changed.
- Store
 - Select "Details" to select different destinations and file formats.
 - Destination:
 - HDD
 - USB
 - File Server (need to connect to one file server first)

-
- DICOM Storage Server (need to connect to one DICOM storage server first)
 - FTP Server (need to connect to one FTP server first)
 - vCloud server (need to connect to one vCloud server first)
 - File Format:
 - VRD
 - DICOM
 - AVI or Image
 - Time span: for storing live scan image
 - VRD: 1-1500 seconds
 - DICOM/AVI: 1-30 seconds
 - Freeze/Unfreeze
 - Save Screen Shot to USB: Press the corresponding key to save the snapshots of touch panel, main screen and the extended screen.
 - Perform Function
 - Measure
 - BodyPattern
 - Comment

Enter “Measure”, “Body Pattern” or “Comment” after press the related key.
 - Do nothing

Note:

1. If store file format is VRD or DICOM, there is an option “Store single frame image”, after it is enabled one single frame image is stored even when the system is in live scan mode.
2. If “Including patient information on snapshot” is enabled, preview the stored image in Report, there are patient ID and name on the image.
3. If store destination is USB, DICOM Storage Server, File Server or FTP Server, there is an option “Backup stored file in Local Machine”, after it is enabled, the image will be stored to the server and HDD.
4. If store destination is DICOM Storage Server or FTP Server, there is an option “Auto image data transfer after end exam”. If it is enabled, the image will be stored to the server after the exam is ended. If it is disabled, the image will be stored to the server immediately.

Factory default configuration as below:

- “Print” key: SONY UP-X898MD
- “Store to HDD” key: Save VRD to HDD.
- “Store to USB” key: Save image to USB.
- “External Foot Switch”: Do nothing.
- “External Foot Switch 1”: Do nothing.
- “External Foot Switch 2”: Do nothing.

Config Network Printer

Select “Search” to find network printers, display all available printers. If the printer is installed, it can be used directly. Otherwise, “Install” should be selected to install the printer’s driver. Also, installed printers can be uninstalled.

12.5 Network

Please ONLY use the hospital’s LAN.

Note:

-Connection of the ultrasound diagnostic apparatus to an IT-NETWORK that includes other equipment could result in previously unidentified RISKS to PATIENTS, OPERATORS or third parties;

-The RESPONSIBLE ORGANIZATION should identify, analyze, evaluate and control these RISKS;

-Subsequent changes to the IT-NETWORK could introduce new RISKS and require additional analysis; and

- changes to the IT-NETWORK include:

- changes in the IT-network configuration;
- connection of additional items to the IT-NETWORK
- disconnecting items from the IT-NETWORK;
- update of equipment connected to the IT-NETWORK; and
- upgrade of equipment connected to the IT-NETWORK.

12.5.1 General

This configuration category enables the operator to set the network for the system and connected remote archive.

If one network cable is plugged in, the operator can do the following settings to connect the network:

- If enable “Auto config IP address”, the system will connect to the network automatically.
- If disable “Auto config IP address”, the operator needs to input IPv4, Subnet mask and Default gateway.

If one wireless network adaptor is plugged in, the operator can do the following settings to connect the network:

- Reboot the system after plug in the adaptor,
- Select one network, input the password, then touch “Enter”;
- Or select “Other”, input the network name and password, then touch “Enter”.
- Touch “Refresh” to update wireless network list.
- Touch “Unsave” to disconnect the current connected network.

12.5.2 File Server

If the operator wants to connect one server:

- Input the server address in “Server Path”, and touch “Confirm”.
- If the server needs authentication, enable “User Authentication” then input username and password.

After all settings are ready, select the “Save” or “Save & Exit” key to save all setting in the system.

12.5.3 Email Setting

- Email Account: Input the email account here for sending emails.
- Email Password: Email account’s password.
- SMTP Server: Input SMTP server here.
- SMTP Port: Input SMTP port here.
- Secure Mode: There are 2 secure modes, “Normal” and “SSL”.
- Email Subject and Email Body: There is default template of email subject and email body, the operator can edit them.
- Addressee: Input one addressee here and select “Test” to test the email account setting.

12.5.4 FTP

- FTP server address: Input FTP server address.
- FTP server port: Input FTP server port.
- FTP sub folder: Input the store path on the server.
- FTP account: Input FTP account.
- FTP password: Input FTP password.
- Enable FTP storage: Enable it to connect FTP server.

During uploading, there is an icon showing the number of the uploading images. If the file upload to server failed, there will be an error icon on the right bottom corner of the main screen. Click the icon, popup the file list of fail uploaded. Select “Retry” to upload again, or select “Delete” to delete the file.

Images of all formats can be uploaded to FTP server, but only DICOM images can be downloaded and viewed.

12.5.5 vCloud Server

Touch “Enable” to activate this function.

The default server is “VINNO vCloud Server”, touch “Test” to try to connect to the server.

The following information is needed to input if touch “Add” to connect another server:

- Server name
- Server address
- Server port
- Account
- Password
- Please contact VINNO service to create a new server.

Remote Maintenance: After enable this function, user can get log, push patch, do remote control through FLYINGSONO.

12.6 DICOM

12.6.1 General

DICOM file format:

Lossless bitmap

Lossless compressed jpeg

Lossy compressed jpeg.

DICOM Compress mode

Full compatibility

Suitable for Vinno: Store one DICOM video, play it on PC with DICOM player, it is not a video but one frame image.

Suitable for third party: Store one DICOM video, play it on VINNO machine, it is not a video but one frame image.

DICOM default encoding: Different encoding methods.

Patient Name Format: Family Name^First Name, First Name^Family Name, Family Name^First Name^Middle Name, First Name^Family Name^Middle Name.

Local setting:

- Local AET: input service class user’s application entity title
- Local Address: input service class user’s address
- Local port: input service class user’s port

12.6.2 Storage

- SCP List: Support multiple DICOM storage servers without number limitation.
- Storage SCP AET: input service class provider’s application entity title
- Storage SCP address: input service class provider’s IP address
- Storage SCP port: input service class provider’s port
- Enable storage: enable it, save DICOM image to PACS server. Please select “Save DICOM to HDD and DICOM server” in “Extended key”.

Only DICOM image can be uploaded to DICOM Storage Server. During uploading,

there is an icon showing the number of the uploading images.
If the file upload to server failed, there will be an error icon on the right bottom corner of the main screen. Click the icon, popup the file list of fail uploaded. Select “Retry” to upload again, or select “Delete” to delete the file.

12.6.3 Worklist

- Worklist SCP AET: input service class provider’s application entity title
- Worklist SCP address: input service class provider’s IP address
- Worklist SCP port: input service class provider’s port
- Enable Worklist: enable it to get patient list from server.

Worklist Special Config:

- Specify Local AET: Only list the patient(s) whose AET is the same with the local AET set in General if it is enabled.
- Force Date Format: Only start date can be selected when filter the patients if it is enabled, the end data is the current data.
- Auto Load Worklist: Get the patient list from worklist server automatically if it is enabled.
- Convert patient name to Double-byte for querying.
- End query when end of sequence.
- Patient Name Format: Family name at the first, or first name at the first.

12.6.4 Print

- Print SCP AET: input service class provider’s application entity title
- Print SCP Address: input service class provider’s IP address
- Print SCP port: input service class provider’s port
- Enable print: Enable it to connect the DICOM printer.
- Enable print: Enable it connect to multiple DICOM printers. (But one key can only link to one printer).

12.7 Service Tool

This menu includes auto diagnostic functions for each electrical part and catches software log files in order for engineers to identify the root cause.

12.7.1 Demo mode

Enable this function, loop playback the images in the clipboard.

12.7.2 Electrical parts auto diagnostic tools

There are several following automatic diagnostic tools for different electrical parts

- Keyboard
 - Select “Diagnostic” to detect if there are some keys stuck.
 - Press the keys on the keyboard, the related button on the touch panel will be highlighted.
- Touch panel
- Monitor
- Probe Board
- Transport
 - Save the information of PCIE status to one log file, and it can be downloaded. Please refer “Software log file download”.
- Acceptor
- Mainboard
- DCDC board

Press and hold “Auto” key about 10 seconds, main monitor and touch panel can be re-configured.

Click “Touch Panel Diagnostic”:

- Test: Touch every point on the touch panel to check if all points work well.
- Calibration: Do calibration for the touch panel.
- Reset: Reset calibration data to default.

12.7.3 Display Backlight Config

The display backlight of Main Screen can be adjusted and reset.

12.7.4 S-Video Output

- Main Screen Output Mode: Basic, All, Image Only.
- Resolution: different resolutions can be selected for video output.
- Show Touch Screen Content: enable this function to display the content of touch screen on the extended monitor.
- Measure Font Size Scale: configurate the font size of measure result on the extended monitor.
- Video Scale Value: change the size of output video.
- Video Horizontal Offset: Move the output video leftward or rightward.
- Video Vertical Offset: Move the output video upward or downward.
- Video Location Reset: Reset the position and size of output video.
- Color Enhance: adjust brightness, contrast and gamma.

12.7.5 Software log file download

There is one “Report” button to send this issue to service engineer.

- Report Current Issue: input some words to describe the issue.
- Report: Copy the description words to the log
- Download log file: Download all log files to one connected USB device.

12.7.6 Export/Import UserDefine Configuration

- Export to USB: Export all user defined data to one USB device, include data of “Application&Parameters”, “Measurements”, “Comments” and “System Setting”. Select “Export” to start.
- Import from USB
 - Select “Import”, come out one dialog for the operator to select which item is needed to import.
 - If there is no user defined data, “Empty User Define config” will be displayed.
 - If there is user defined preset, please select probe and application which is needed to be imported.
 - If enable “Reset to factory default”, all user defined presets will be cleared before import user defined presets from USB disk.
- Delete User Defined Preset: After select “Delete”, the system need to restart. Then all user defined preset will be cleared.
- Delete All User Defined Configuration: After select “Delete”, the system needs to restart. Then all user defined configurations are cleared, all settings are reset as factory default.

12.7.7 System Upgrade

There is one “Check” button to check the system upgrade.

- Plug in USB memory stick
- Select “Check” button
- The system will check the available new version software from the USB memory stick. If the USB memory stick has valid upgrade, select “OK”, the system start upgrade.

12.8 Features

- Installed Features: List all features can be used at the current moment, including standard features and optional features that already got license.
- Available Features: List all features those are optional but no license.

12.9 User Management

This section defines the operator's ID, the operator's authority and login procedure setting.

Start the system with "Show Login window" enabled, the operator can select "User Management" in "System Settings".

Authority levels:

1. Administrator: can add, modify and delete a user.
2. No authority (selecting "Cancel" to login): cannot add, modify or delete a user.

The following steps show how to manage users.

Add New User:

- Input "User Name", "Password".
- Select "Admin" (administration) or "User" authority.
- Select "Enter" button to confirm adding action

The factory default Administrator account is as below:

Name: admin

Password: admin

Modify User:

- Select the edit button of one user.
- Edit its name and password, then select "Enter".

Remove operator:

- Select the user to be removed in user list.
- Press "X" button to delete this user.

12.10 About

This section displays "Software Version", "Hardware Version", "DongleId", "License", "CopyRight".

13 Accessories and Peripherals

13.1 Introduction

This chapter provides information on peripherals that can operate with this device as follows:

- Color thermal printer
- Black & White thermal printer
- USB DVDRW
- ECG
- Bluetooth dongle
- Wireless adapter
- External Foot switch
- Cart models CART-S or CART-F



CAUTION

Only use VINNO approved equipment as internal peripherals.

External peripheral equipment must be CE marked and in compliance with relevant standards (EN 60601-1 or EN 60950). Anyone who uses this device with external peripheral equipment that are powered from a separated wall receptacle is considered to be configuring a medical system, is therefore responsible to verify that the system complies with EN 60601-1.

All devices meeting IEC60950 must be kept outside the patient environment as defined in IEC60601-1, unless equipped with additional earth or extra isolating transformer. Commercial devices such as laser printers, VCRs and external monitors, usually exceed allowable leakage current limits and, when plugged into separate AC outlets, are in violation of patient safety standards. Suitable electrical isolation of such external AC outlets, or providing the device with extra protective earth, will be required in order to meet UL2601-1 and IEC60601-1 standards for electrical leakage.



CAUTION

When using the peripheral devices, observe all warnings and cautions given in the peripheral operator manuals please.

13.2 Printing



CAUTION

Do not connect printer power cable to other devices except the approved printer.

This device can support a color and a black & white thermal printer. The printer devices are controlled from “Print” key on the control panel. “Store to HDD” or “Store to USB” keys can be also configured as printing key. Alternatively, the “Print” key can be also configured as storage function. Refer to system set-up chapter.

When pressing “Print” key on the control panel, the image displayed on the screen is printed on B&W or Color Printer, which depends on the key assignment configuration.

13.3 Approved Peripherals

The following devices are approved as peripherals.

- B&W thermal video printer: Sony UP-D897
- B&W thermal video printer: Sony UP-X898MD
- Color thermal video printer: Sony UP-D25MD
- DVDRW: Pioneer DVR-XU01C
- Bluetooth: ORICO BTA-403
- Bluetooth: ORICO BTA-402
- Single-Key Foot Switch: KACON HRF-M5-U IP 68
- Dual-Key Foot Switch: KACON HRF-M52-U IP 68

The product external interface includes VCR audio output interface, USB (universal serial bus), analog video output interface S - VIDEO, digital video output interface DVI, and network interface RJ45.

Refer to the document accompanying those peripherals to be familiar with specification.

If the operator wants to install the driver of the third party printer, please contact VINNO.

14 Operator maintenance and technical data

14.1 System maintenance

As there are no components with short working lives, periodic maintenance inspection is not mandatory. However, some customer quality assurance programs may require the additional inspections at periods of frequency different from those listed in this manual.

The manufacture will make available on request circuit diagrams, component part lists, descriptions, calibration instructions, or other information that will assist service personnel to repair those parts of the equipment that are designated by the manufacture as repairable by service personnel.



CAUTION

The operator must ensure that safety inspections are performed at least every 12 months according to the requirements of the patient safety standard IEC 60601-1. Only trained person are allowed to perform the safety inspections mentioned above.

To ensure maintaining good operating conditions of this device, we recommend the customer internal maintenance plan includes the following procedures.

14.1.1 Inspecting this device



CAUTION

If any defect is observed, DO NOT operate this device and inform a qualified service person.

Inspect the following parts on a monthly basis:

- Connectors on cables, for any mechanical defects
- Entire length of electrical and power cables, for cuts or abrasions
- Equipment, for loose or missing hardware
- Control panel and touch panel defects
- Caster brakes

**WARNING**

To avoid electric shock hazard, DO NOT remove panels or covers from this device.

14.1.2 Virus protection

To minimize virus vulnerability this device is configured with a minimal set of open ports and all network services not active used. This significantly reduces the risk of a virus attack. VINNO Company is continuously assessing the need for additional actions to reduce vulnerability of equipment; this includes vulnerability scanning of our products and evaluation of new security patches for the third party technology used.

**CAUTION**

This device should only be used with an internal Local Area Network (LAN).

14.1.3 Cleaning this device

Frequent and diligent cleaning of this device will reduce the risk of spreading infection from person to person, and also help maintain a clean working environment.

When performing cleaning procedures, to prevent the risk of system damage, always observe following precautions:

- Use only recommended cleaning materials and solutions
- Do not spray any liquid directly onto this device's covers, monitor, touch panel and control panel
- Do not allow any liquid to drip or seep into this device.
- Prior to cleaning, turn OFF power of this device

System cabinet cleaning:

- On a weekly basis, moisten a soft, non-abrasive folded cloth or sponge with a mild, general purpose, non-abrasive soap and water solution. DO NOT use any solution containing abrasive powder or strong chemicals such as acid or alkaline. Squeeze excess liquid from the cloth/sponge, and then wipe down the top, front, back and both sides of this device.
- Rinse the cloth/sponge with clean running water and wipe this device surfaces again.
- Use a dry, soft, line-free cloth to dry this device surfaces.

-
- Wait for this device surfaces to dry completely before turn on the system.

Note: If disinfection is required, wipe with a soft, dust-free cloth and a small quantity of isopropyl alcohol.

Monitor cleaning:

On a weekly basis, gently wipe the monitor with a dry, soft, lint-free non-abrasive folded cloth. Wipe or dust the stain gently with a soft, dry cloth. If the stain remains, moisten a soft, lint-free cloth with water or a 50/50 mixture of isopropyl alcohol and water. Wring the cloth to remove as much liquid as possible then wipe the monitor again.

Control panel cleaning:

DO NOT spray any liquid directly onto the control panel!

- On a weekly basis, moisten a soft, non-abrasive folded cloth or sponge with a mild, general purpose, non-abrasive soap and water solution or general purpose disinfectant. DO NOT use any solution containing abrasive powder or strong chemicals such as acid or alkaline.
- Squeeze excess liquid from the cloth/sponge, and then wipe down the control panel.
- Rinse the cloth/sponge with clean running water and wipe this device surfaces again.
- Use a dry, soft, lint-free cloth to dry this device's surfaces.
- Wait for this device surfaces to dry completely before turning on the system.

DVDRW drive cleaning:

Clean the drive head and media with the vendor-supplied cleaning kit. DVD or CD must be stored away from dust and cigarette smoke. Do not use alcohol or benzene to clean the DVDRW drive.

Peripherals:

Clean the peripherals in accordance with the respective manufacturer's directions.

14.1.4 Battery

Battery

The lithium ion battery provides power when an AC power source is not available. Lithium ion batteries last longer than conventional batteries and do not require replacement as often. You can expect one hour of battery life with a single fully charged battery. Used batteries should not be placed with common household waste products. Contact local authorities for the location of a

chemical waste collection program nearest you.

NOTE: The battery is designed to work with this device only. Only use the batteries authorized by VINNO.

 **WARNING**

- The battery has a safety device. Do not disassemble or alter the battery.
- Charge the batteries only when the ambient temperature is between 0° and 50° and discharge the batteries between 0°C and 60°C.
- Do not short-circuit the battery by directly connecting the negative terminals with metal objects.
- Do not heat the battery or discard it in a fire.
- Do not expose the battery to temperature over 60°C. Keep it away from fire and other heat sources.
- Do not charge the battery near a heat source, such as a fire or heater.
- Do not leave the battery in direct sunlight.
- Do not pierce the battery with a sharp object, hit it, or step on it.
- Do not use a damaged battery.
- Do not solder a battery.
- Do not connect the battery to an electrical power outlet.

 **WARNING**

If this device is not being used on a monthly basis, the battery needs to be removed during the lengthy non-use period.

 **CAUTION**

To avoid the battery bursting, igniting, or fumes from the battery causing equipment damage, observe the following precautions:

- Do not immerse the battery in water or allow it to get wet.
- Do not put the battery into a microwave oven or pressurized container.
- If the battery leaks or emits an odor, remove it from all possible flammable sources.
- If the battery emits an odor or heat, is deformed or discolored, or in a way appears abnormal during use, recharging or storage, immediately remove it and stop using it. If you have any questions about the battery, consult VINNO or your local representative.
- Short term (less than one month) storage of battery pack:
- Store the battery in a temperature range between 0°C and 50°C.

 **CAUTION**

- Long term (3 months or more) storage of battery pack:
- Store the battery in a temperature range between -20°C and 45°C.
- Upon receipt of this device and before first time usage, it is highly

recommended that the operator performs one full discharge/charge cycle. If the battery has not been used for >2 months, the operator is recommended to perform one full discharge/charge cycle. It is also recommended to store the battery in a shady and cool area with FCC (full current capacity).

- One Full Discharge/Charge Cycle Process:

1. Full discharge of battery to let this device automatically shut down.
2. Charge this device to 100% FCC (full current capacity).
3. Discharge of this device for complete shut down (takes one hour for discharge).

- When storing packs for more than 6 months, charge the pack at least once during the 6 month timeframe to prevent leakage and deterioration in performance.

- Use only VINNO recognized batteries.

Battery Replacement and Disposition:

Battery replacement every three years is recommended.

Contact a local Service Representative for the replacement of the battery. Used batteries will be discarded appropriately by VINNO.

NOTE: Disposing of the battery should meet local law and regulatory requirements.

NOTE: Dispose of the system according to local law and regulatory requirements.

AC Adapter



CAUTION

Do not use an AC adapter without approval by VINNO.

Be sure that nothing rests on the AC adapter's power cable and that the cable is not located where it can be tripped over or stepped on.

Place the AC adapter in a ventilated area, such as a desk, when you use it to run this device. Do not cover the AC adapter with paper or other items that will reduce cooling; do not use the AC adapter inside a carrying case.

VINNO

LI-ION BATTERY PACK 锂离子电池
 MODEL 型号: V8BAT
 14.8V \approx 77Wh
 4ICR19/65-2

REF 1000280 Rev1
SN PV8XXXXXXXX
 XXXX-XX

⚠ CAUTION:
 Risk of fire, explosion, or burns. Keep the battery away from fire.
 Do not short circuit. Never attempt to disassemble the battery.
 Charge only with lithium-ion charger supplied with your device.
 Read user manual for additional safety instructions.

- 请勿将电池拆卸、投入水中或火中
- 请使用指定充电器充电
- 不遵守以上要求可能导致电池出现爆炸、起火或高温等异常现象
- 使用前请阅读用户手册

Getac 神讯电脑(昆山)有限公司 MADE IN CHINA
 MANUFACTURED FOR VINNO TECHNOLOGY (SUZHOU) CO.,LTD

Battery label

GlobTek® ,Inc.
 www.globtek.com
 MEDICALITE POWER SUPPLY(电源供应器)

P/N料号: TR9CZ6000GS001I(RVB)
 MODEL(型号): GTM43004P-12024-4.0-T3
 INPUT(输入): 100-240V,50-60Hz,2.0A
 OUTPUT(输出): 20V \approx 6.0A

Intertek
 IEC/EN60601-1

RECOGNIZED COMPONENT

 ETL
 Intertek
 4007497

Conforms to ANSI/AAMI Std. ES60601-1
 Cert. to CAN/CSA Std.C22.2 NO.60601-1
 Conforms to ANSI/UL Std. 60950-1
 Cert. to CAN/CSA Std.C22.2 NO.60950-1

CE

IEC/EN60335-1

N

30

CCC

PGT

T4.0A 250VAC

i

CQC PSE
 GlobTek, Inc.

PIN1,2:+V
 PIN3,4:-V
 Shield:Shield

VCI

EFFICIENCY LEVEL

RoHS 2 IP40

WWYY MADE IN CHINA(中国制造)
 仅适用于海拔2000米以下地区使用

AC Label

14.1.5 Service life

Device/accessories	Intended service life
VINNO 5 series, VINNO 6 series, VINNO 8 series	This system is expected to be used for at least 8 years from the date of production under regular maintenance and the production date is showed on the product label.

14.2 Technical Data

14.2.1 General

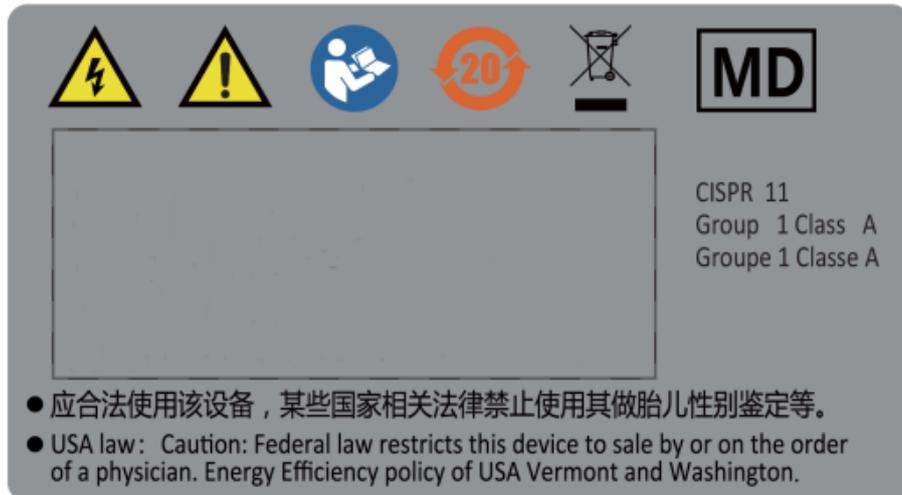
Model: VINNO 6PRO_VINNO 6_VINNO 6EXP

Serial number: marked in identification plate on the rear side of this device

Identification plate:

Example

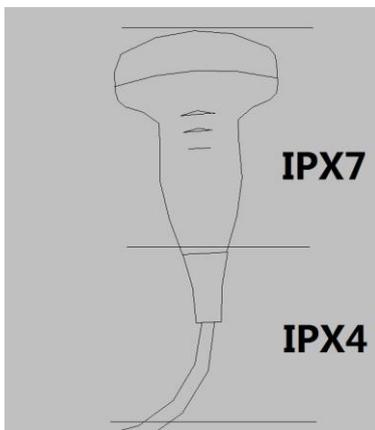




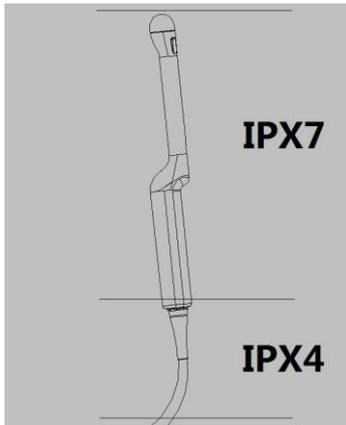
Electro-magnetic influence: In the working frequency range of the ultrasound system from 1 to 18MHz can be visible in the range from 200 to 500mV/m influence depending on the probe connected.

Safety classification:

- a) Type: Class I and internal power
- b) Type BF applied part: Ultrasound probe, Type CF applied part: ECG electrode
- c) No defibrillation-proof applied part
- d) Waterproof level: IPX0, except transducer lens is IPX7, probe housing to cable is IPX4 but intra operative probe housing to cable is IPX7.
- e) NOT category AP equipment or category APG equipment
- f) Sterilization shall be taken by other methods validated and described by the MANUFACTURER.
- g) Ordinary Equipment/Continuous Operation
- h) not intended for use in an OXYGEN RICH ENVIRONMENT

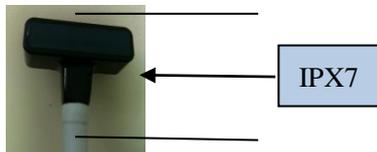


(The grade of waterproof for all convex probes, linear probes and phased array probes can refer this picture.)



(The grade of waterproof for all endocavity probes can refer this picture.)

The grade of waterproof for I4-IIT



Ambient temperature: 10°C to 40°C or 50°F to 104°F of operational temperature.

Relative Humidity: 30% to 75% in operation.

Stock and transportation temperature: -10°C to 50°C or 14°F to 122°F.

Stock and transportation humidity: less than 90% RH, no condensation.

Barometric Pressure: 700 to 1060 hPa

Humidity: 30% to 85% no condensation when operating. And in stock and transport conditions it should be less than 90%RH no condensation.

Dimension: Width: 340mm.

Length: 387mm

Height: 72mm

Weight: Basic unit without accessories approx: 3.8kg

14.2.2 Power supply

Power requirement: 100V – 240VAC. 50Hz or 60Hz

Power consumption: Nominal <= 170VA.

Battery

Model Type: V8BAT
Voltage: DC 14.8V
Capacity: 77Wh
Maximum continuous discharge current: 6A

14.2.3 Operator panel

Control panel: Ergonomic designed control panel with interactive back-lighting.

Touch panel: 8" projected capacitive touch panel in high resolution and color. And it is the operator-defined and configurable layout UI.

Monitor: 15.6" high resolution monitor with wide view angle: +178° to -178°. Horizontal swivel angle: 30°-150°.

14.2.4 Console Design

- 1 active probe port

14.2.5 Transmitter

Frequency range: Broadband system 1 to 18MHz, automated adaptation to the probe used.

Control of acoustic output: 10% -100%

Focusing: selectable transmit focal width and focal depth

14.2.6 Receiver

Frequency range: Broadband system 1 to 20MHz, automated adaptation to the probe used.

Focusing: Digital dynamic focusing system, accuracy of focus: +/- 5ns.

Sample-rate: 50MHz.

14.2.7 Scan Converter

Image resolution: 1920 x 1080

Image Lines: max 1024

Scan angle: max 360°

14.2.8 Cine Loop Memory

Call back sequence: manually frame by frame. Call back automatically from 20% to 400% of real time rate with selectable start and end point.

14.2.9 Basic Measurement Accuracy

The table below lists the basic measurement accuracy of this device, in order to guide the operator to use this instrument for clinical diagnosis when the number of changes or measurement error may arise. The error may be due to the limitations of the instrument itself or inappropriate operation of the operator. If an operator regulates the operation according to the operational guidelines, can make the potential measurement error reduced to a minimum.

Measurement		Unit	Accuracy	Conditions		
Distance	Lateral	mm	±5%	B B Harmonic		
	Axial	mm	±5%			
	Depth	mm	±5%			
Perimeter	L&W Ellipse Polygon Spline Trace	mm	±10%			
	Area	L&W Ellipse Polygon Spline Trace	mm ²		±10%	
		Volume	L&W&H		mm ³	±30%
		Angle			deg	±5%
Time			s		±5%	
Slope	Velocity	mm/s	±10%		M	
	Acceleration	mm/s ²	±10%		PW	
SV Depth		mm	±2mm	PWD, TD		
Velocity		cm/s	0-100cm/s: ±10%	PWD, CWD		
			100-130cm/s: ±5%			
			50% (only for reference)		CFI	
Angle Correction		cm/s	0-60deg: ±5%	PWD		
			60-80deg: ±12%			

15 Probe Maintenance



CAUTION

Improper handling can lead to early probe failure and electric shock hazards. Only follow the specific cleaning and disinfection procedures provided in this chapter and the germicide manufacturer's instructions.

Improper cleaning and disinfection procedures will result in probe failure which will void probe warranty.

15.1 Inspecting the probe

After each use, needs to inspect the probe, clean the probe and disinfect the probe if required. Inspect the transducer cable, case, and lens before each use.



CAUTION

If any damages are found, DO NOT uses the probe until it has been inspected and released for further use by VINNO qualified person.

After each use, inspect the lens, the probe housing and the cable as shown below figure. Check whether there is damage area that might allow the liquid into the probe.



Before each use, inspect the lens, the probe housing and the cable. Check whether there is damaged area that might allow liquid into the probe. When connected to this device, needs to test the functionality of the probe.

Note:

Only qualified ultrasound gel is approved for use.

15.2 Special handling instructions

Using protective sheaths:



CAUTION

Protective barrier may be required to minimize disease transmission.

Use of legally marketed, sterile probe sheath is strongly recommended for intro cavity and intra operative procedures.

Instructions

Each probe sheath kit consists of a flexible and elastic sheath which can cover the probe and cable.



WARNING

DO NOT use an expired sheath. Before using probe sheaths, verify whether the term of validity has expired. Also read sheath document carefully to avoid allergic reaction in sensitive individuals.

15.3 Probe handling and infection control

This information is intended to increase user awareness of the risks of disease transmission associated with using this equipment and provide guidance in making decisions directly affecting the safety of the patient as well as the equipment user.

Diagnostic ultrasound systems utilize ultrasound energy that must be coupled to the patient by direct physical contact. Depending on the type of examination, this contact occurs with a variety of tissues ranging from intact skin in a routine exam to re-circulating blood in a surgical procedure. The level of risk of infection varies greatly with the type of contact.

One of the most effective ways to prevent transmission between patients is with single use or disposable devices. However, ultrasound transducers are complex and expensive devices that must be reused between patients. It is very important, therefore, to minimize the risk of disease



CAUTION

Risk of Infection: ALWAYS clean and disinfect the probe between patients to the level appropriate for the type of examination and use cleared probe sheaths where appropriate.

**CAUTION**

Adequate cleaning and disinfection are necessary to prevent disease transmission. It is the responsibility of the equipment user to verify and maintain the effectiveness of the infection control procedures in use. Always use sterile, legally marketed probe sheaths for intra-cavitary and intra-operative procedures.

15.4 Probe Safety

**WARNING**

Ultrasound probes are highly sensitive medical devices that can easily be damaged by improper handling. **DO NOT** use a damaged or defective probe. Failure to follow these precautions can result in serious injury and equipment damage.

15.5 Cleaning and disinfecting probes

**CAUTION**

You **MUST** disconnect the probe from the VINNO prior to cleaning/disinfecting the probe. Failure to do so could damage the system.

**CAUTION**

There is no limit to the number of times the probe can be cleaned and sanitized, and cleaning and sanitizing will not affect the performance of the probe. If a professional doctor finds any performance problems after cleaning and disinfecting the probe, please contact the manufacturer immediately.

15.5.1 Cleaning Procedure Before Disinfection

Cleaning procedure

1. Disconnect the probe from the unit.
2. Remove the coupling gel by wiping the probe lens with a soft cloth or paper towel.
3. Wipe the probe and cable with a soft cloth or paper towel moisten in ENZOL® Enzymatic Detergent (<80 °F/27 °C).
4. Wipe the probe and cable with a soft cloth or paper towel moisten in clean water until all cleaner is removed.
5. Wipe dry with a soft cloth or paper towel.

Cleaning and disinfectants name	Intended Use	Manufacturer
ENZOL®Enzymatic Detergent	Cleaning	ASP



CAUTION

To minimize the risk of infection from blood-borne pathogens, you must handle the probe and all disposables which have contacted blood, other potentially infectious materials, mucous membranes, and non-intact skin in accordance with infection control procedures. You must wear protective gloves when handling potentially infectious material. Use a face shield and gown if there is a risk of splashing or splatter.

15.5.2 Disinfecting probes

Disinfecting probes

Although representing a necessary step in protecting patients and employees from disease transmission, liquid chemical germicides must also be selected to minimize potential damage to the transducer. It is important to use germicides of probe recommended by VINNO company.

Below is the list of germicides for each probe:

Cleaning and disinfectants name	Intended Use	Manufacturer
Cidex OPA	High-level disinfection	Johnson & Johnson
Oxivir® Tb	Low-level disinfection	Diversey

High Level Disinfection:

1. Immerse the head of probe completely in CIDEX OPA Solution for a minimum of 5 minutes at 20 °C (68 °F) or higher to destroy all pathogenic microorganisms.
2. Remove the probe from the solution and rinse thoroughly by immersing it for a minimum of 1 minute in duration in a large volume (e.g. 2 gallons) of sterile water. Flush all lumens with large volumes (not less than 100 mL) of rinse water.
3. Repeat the procedure for a total of THREE (3) RINSES, with water discarded after every rinse.

Low Level Disinfection:

1. Apply Oxivir® Tb undiluted to surfaces by spray, cloth or disposable wipe.
2. All surfaces must remain visibly wet for 1 minute for viruses and bacteria. For

-
- fungi, surfaces must remain visibly wet for 10 minutes.
3. Allow to air dry.

Returning/shipping probes and repair parts

When return a probe or part for service, needs to clean and disinfect the probe or part prior to packing and shipping this device. Ensure that the follow probe cleaning and disinfection instruction. This ensures that the employees in the transportation industry as well as the people who receive the package are protected from any risk.

15.5.3 Inspect probes

Cleaning and sanitizing will not affect the performance of probes. After cleaning and sanitizing, please check probes:

1. Visually inspect the appearance of the probe to see if it is in good condition.
2. Connect the probe to the VINNO and check the image quality, if there is nothing abnormal, indicates that the probe is normal and can be used. If the image quality is not so good, please contact the manufacturer immediately.

15.6 Coupling gels



CAUTION

Do not use gels (lubricants) that are not recommended. They may damage the probe and void the warranty.

In order to assure optimal transmission of energy between the patient and probe, a conductive gel or couplant must be applied liberally to the patient where scanning will be performed.

Note:

We do not recommend that the operator use colored ultrasound gel. Long-term use may cause discoloration of the probe housing, although the discoloration does not affect the performance and functionality of the probe.