

# Service Procedures

R series

Revision 5.0



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A handwritten signature in black ink, appearing to be 'Kevin'.



## Maintenance

This chapter is about how to conduct maintenance on Vinno ultrasound scanner.

Thanks to the design of Vinno ultrasound scanner, there is no need to do periodical maintenance on a mandatory basis. However some customers' Quality Assurance program may require a high frequent maintenance than this manual.

As to how often maintenance should be performed, it depends on customers' quality assurance program. And Vinno recommendations are as follows, so as to ensure accuracy and performance.

ITEMS	RECOMMENDED FREQUENCY	TARGET PERFORMER
System functional checks	Every 12 months	Customer or service of Vinno
Cleaning without opening the system	Every 12 months	Customer or service
Cleaning with opening the system	Every 12 months	Service of Vinno, or trained customer

The whole maintenance work consists of 2 parts: System functional checks, and cleaning.

Your Vinno service representative can help you with establishing, performing and maintaining records for a quality assurance program. Contact Vinno for coverage and price for service.

### 8.1 Warnings and precautions



#### **WARNING**

Be sure to disconnect the system power plug and switch off the main circuit breaker before you remove any parts.



#### **WARNING**

Always wear an anti-static strap when handling electronic parts and even when disconnecting and connecting cables.



#### **WARNING**

Do not pull out or insert circuit boards while power is on.

## System functional checks

### Preliminary checks

This sort of checks is mainly for pre-checks before the following checks. And make notes in form 1, get confirmed by customer every time you perform service.

Step	Item	Description
1.	Ask & record	Ask users if they have any question about system. And record their questions.
2.	Paperwork	Record the type of the system, probes' name, software version on the maintenance record form.
3.	Power up	1. Turn on the system, and verify all fans and peripherals work properly.  2. Verify that no warning or error messages are displayed on the LCD monitor during powering up.
4.	Probes	Verify that the system recognizes all probes.
5.	Displays	Verify proper display on the monitor and touch panel.
6.	Review Vinnologs	Vinnologs can be found in C: disc
7.	Service diagnostic	Run Service diagnostic in System setting.
8.	Image Archive	Back up all the images and information into an appropriate media.

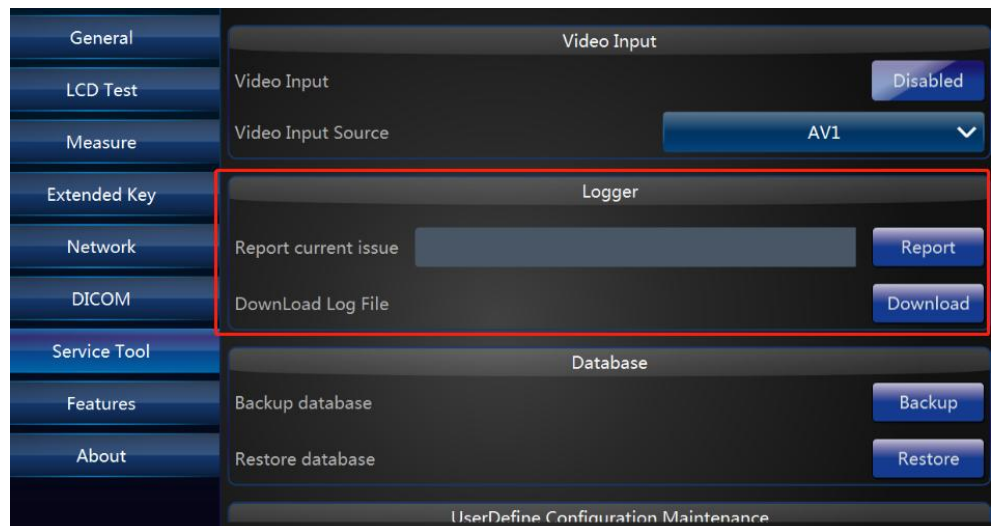
Service diagnostic can be found in "SYS Setting" as follows.



There are several automatic diagnostic tools for different electrical parts. There are as follows.

1. Keyboard diagnostic
2. Touch Panel diagnostic
3. LCD display diagnostic
4. Probe board diagnostic
5. Transmit board diagnostic
6. Receiver board diagnostic
7. Motherboard diagnostic
8. DCDC diagnostic

And there is one button to save “Vinnologs” files to USB memory stick-“Log download” key. Insert USB in the USB housing, and then touch “Log download” key. Vinnologs will be saved in your USB stick.



## Functional checks

The following steps show how to do functional checks. Refer to form 2

STEP	ITEM	DESCRIPTION
1	Power plug check	Power off. Disconnect the power plug. Inspect it to check if there is any damage.
2	Power wire checks inside	Pull the power plug out, wait 30 seconds. Remove right and back covers. Verify that the LINE, NEATRAUL and GROUND wire are properly attached to the terminals and no strands may cause a short circuit.
3	Connector checks	Remove all the covers, and check all the connectors to see if they are tightly connected. And install all the covers.
4	Power up and B mode checks	Power up. System can be powered up. Verify basic B-mode operation, and check the system controls can affect B mode scan.
5	CF mode checks	Verify B+CF mode operation, and check the system controls can affect CF mode scan.
6	PW mode	Verify B+PW mode operation, and check system controls. Verify B+CF+PW mode operation, and check system controls. Verify multiple and triple mode, and check system controls.
7	M mode	Enter M mode, and check M mode controls.
8	3D mode	Where applicable, verify 3D mode, and check controls.
9	4D real time	Where applicable, verify 4D mode. And check its applicable controls.
10	CW mode	Verify B+CW mode operation, and check system controls. Verify B+CF+CW mode operation, and check system controls. Verify multiple and triple mode, and check system controls.

11	Applicable software option checks	Verify other system configuration controls. Store an image or a movie.
12	Peripheral checks	<ol style="list-style-type: none"> <li>1. Check printer, if applicable.</li> <li>2. Check DICOM, send an image to a DICOM device.</li> <li>3. Check USB. Store an image to USB.</li> </ol>
13	Check noise and probe element test for each probe	Insert every probe, and check if there is any noise in the image. And check physical appearance of probes, perform element test for each probe.
14	Labeling	Check the labels to verify if they are still present and in a readable status.
15	Casters and brakes	<p>Release brakes and slide the system to check all the casters can move.</p> <p>Tap each brake, to check if the brake works properly and stop corresponding caster rolling.</p>
16	Top console up/down check if applicable	Press Up/Down button, top console can go up and down
17	Top console movement	Carefully slide the operator panel, turn it to right and left side. It can move without any obstacles.
18	Keyboard is lit?	Check the keyboard to see if it is green lit?

## Cleaning



### **WARNING**

Use only recommended cleaning materials and solutions. And Do not use any solution containing abrasive powder or strong chemicals such as acid or alkaline.



### **WARNING**

Do not spray any liquid directly onto the system's covers, LCD display, touch panel and keyboard.



### **WARNING**

Power off and unplug the power cord, wait at least 30 seconds, before you start cleaning.

## Cleaning procedures for customers

It is recommended that customer clean this device every week. And the procedures are as follows.

1. Brush the device as a whole. Use a Dust proof brush to brush the whole device to get rid of dusts and ashes.

2. Clean LCD monitor.

Gently wipe the LCD display with a dry, soft, lint-free non-abrasive folded cloth. If the stain remains, moisten the cloth with water or a 50/50 mixture of isopropyl alcohol and water. Wring the cloth to get out as much liquid as possible, and then wipe the LCD stain away.

3. Clean keyboard.

Moisten a soft, non-abrasive folded cloth or sponge with 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, and wipe the keyboard. After that rinse the cloth with running water and wipe the keyboard again. Use a dry cloth to dry the keyboard. And wait the keyboard to dry before return to use again.

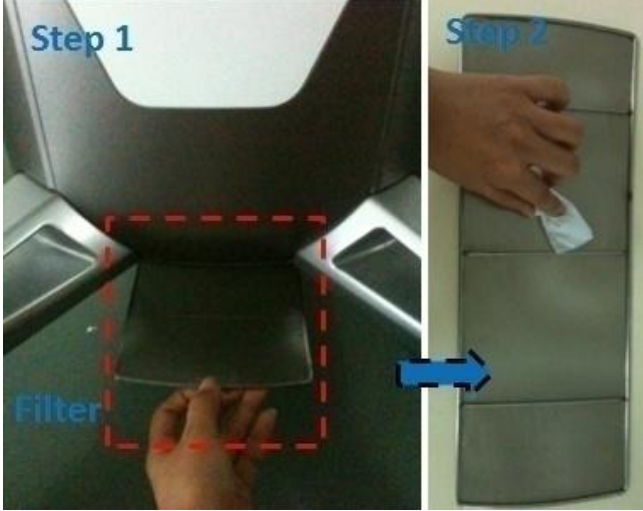
4. Clean covers and bumpers

Use the same way as cleaning the keyboard.

## Cleaning procedures for service

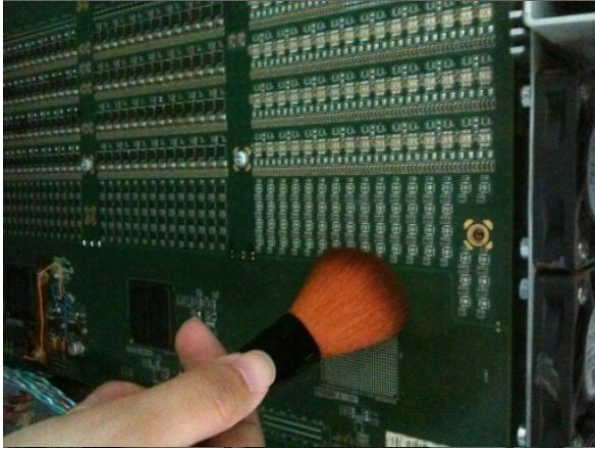
Cleaning procedures for service are as follows. And cleaning procedures should be done every time when service maintenance is conducting. And remember to power off before cleaning.

1. Remove left, right, back and bottom covers. Wipe them with moisture cloth with soap. And wipe again with water.
2. Remove filter if applicable. Clean the filter. After that, reinstall the filter to system.

PROCEDURES	CORRESPONDING PICTURE
<ol style="list-style-type: none"><li>1. Pull the filter out from the system.</li><li>2. Carefully wipe the filter to get rid of the dusts.</li><li>3. reinstall the filter to the system</li></ol>	

3. Remove all the outside fans. And clean them with vacuum cleaner or soft-bristle brush to remove dust or ashes.

4. Use vacuum cleaner or soft-bristle brush to remove any lint and dust from the inner parts. If the host assembly seems accumulated with dusts and lint, remove the host assembly from the system. And open it, use soft-bristle brush or vacuum cleaner to clean the PWAs and motherboard.

PROCEDURES	CORRESPONDING PICTURE
<p>1. Remove host assembly from the system</p> <p>2. Carefully use a brush (or vacuum cleaner) to clean the inner PWAs.</p>	

5. Clean DVDRW. Use a brush to remove dust from the DVD RW.

6. Peripherals cleaning.

7. Reinstall the host assembly and covers. Use soft bristle to remove dust from any part of the system.

8. Wait until the whole device is dried. Plug the power cord and power up.

## Cleaning and disinfecting probes



### CAUTION

Transesophageal and intraoperative probes require a special handling. Refer to the user documentation enclosed with these probes.



### CAUTION

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

## Cleaning probes

### Cleaning procedure

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

## 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
OxivirR® Tb	Low-level disinfection	Diversey

### High Level Disinfection:

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.

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.

Repeat the procedure for a total of THREE (3) RINSES, with water discarded after every rinse.

### Low Level Disinfection:

Apply Oxivir Tb undiluted to surfaces by spray, cloth or disposable wipe.

All surfaces must remain visibly wet for 1 minute for viruses and bacteria. For fungi, surfaces must remain visibly wet for 10 minutes.

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.