Voluson® S8/ Voluson® S6

Service Manual

- Voluson® S8 systems
- Voluson® S6 systems

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Important Precautions

WARNING (EN)

- THIS SERVICE MANUAL IS AVAILABLE IN ENGLISH ONLY.
- IF A CUSTOMER'S SERVICE PROVIDER REQUIRES A LANGUAGE OTHER THAN ENGLISH, IT IS THE CUSTOMER'S RESPONSIBILITY TO PROVIDE TRANSLATION SERVICES.
- DO NOT ATTEMPT TO SERVICE THE EQUIPMENT UNLESS THIS SERVICE MANUAL HAS BEEN CONSULTED AND IS UNDERSTOOD.
- FAILURE TO HEED THIS WARNING MAY RESULT IN INJURY TO THE SERVICE PROVIDER, OPERATOR OR PATIENT FROM ELECTRIC SHOCK, MECHANICAL OR OTHER HAZARDS.

AVERTISSEMENT (FR)

- CE MANUEL DE MAINTENANCE N'EST DISPONIBLE QU'EN ANGLAIS.
- SI LE TECHNICIEN DU CLIENT A BESOIN DE CE MANUEL DANS UNE AUTRE LANGUE QUE L'ANGLAIS, C'EST AU CLIENT QU'IL INCOMBE DE LE FAIRE TRADUIRE.
- NE PAS TENTER D'INTERVENTION SUR LES éQUIPEMENTS TANT QUE LE MANUEL SERVICE N'A PAS éTé CONSULTé ET COMPRIS.
- LE NON-RESPECT DE CET AVERTISSEMENT PEUT ENTRAîNER CHEZ LE TECHNICIEN, L'OPéRATEUR OU LE PATIENT DES BLESSURES DUES à DES DANGERS éLECTRIQUES, MéCANIQUES OU AUTRES.

WARNUNG (DE)

- DIESES KUNDENDIENST-HANDBUCH EXISTIERT NUR IN ENGLISCHER SPRACHE.
- FALLS EIN FREMDER KUNDENDIENST EINE ANDERE SPRACHE BENöTIGT, IST ES AUFGABE DES KUNDEN FüR EINE ENTSPRECHENDE ÜBERSETZUNG ZU SORGEN.
- WARTEN SIE DIESES GERäT NUR, WENN SIE DIE ENTSPRECHENDEN ANWEISUNGEN IM KUNDENDIENST-HANDBUCH GELESEN HABEN UND NACHVOLLZIEHEN KöNNEN.
- WIRD DIESE WARNUNG NICHT BEACHTET, SO KANN ES ZU VERLETZUNGEN DES KUNDENDIENSTTECHNIKERS, DES BEDIENERS ODER DES PATIENTEN DURCH ELEKTRISCHE SCHLäGE, MECHANISCHE ODER SONSTIGE GEFAHREN KOMMEN.

AVISO (ES)

- **ESTE MANUAL DE SERVICIO SóLO EXISTE EN INGLéS.**
- **SI ALGúN PROVEEDOR DE SERVICIOS AJENO A GEHC SOLICITA UN IDIOMA QUE NO SEA EL INGLéS, LA TRADUCCIóN ES RESPONSABILIDAD DEL CLIENTE.**
- **NO SE DEBERá DAR SERVICIO TéCNICO AL EQUIPO, SIN HABER CONSULTADO Y COMPRENDIDO ESTE MANUAL DE SERVICIO.**
- **LA NO OBSERVANCIA DEL PRESENTE AVISO PUEDE DAR LUGAR A QUE EL PROVEEDOR DE SERVICIOS, EL OPERADOR O EL PACIENTE SUFRAN LESIONES PROVOCADAS POR CAUSAS ELéCTRICAS, MECáNICAS O DE OTRA NATURALEZA.**

ATENÇÃO (PT)

- **ESTE MANUAL DE ASSISTêNCIA TéCNICA Só SE ENCONTRA DISPONíVEL EM INGLêS.**
- **SE QUALQUER OUTRO SERVIçO DE ASSISTêNCIA TéCNICA, QUE NãO A GEHC, SOLICITAR ESTES MANUAIS NOUTRO IDIOMA, é DA RESPONSABILIDADE DO CLIENTE FORNECER OS SERVIçOS DE TRADUçãO.**
- **NãO TENTE REPARAR O EQUIPAMENTO SEM TER CONSULTADO E COMPREENDIDO ESTE MANUAL DE ASSISTêNCIA TéCNICA.**
- **O NãO CUMPRIMENTO DESTE AVISO PODE POR EM PERIGO A SEGURANçA DO TéCNICO, OPERADOR OU PACIENTE DEVIDO A‘ CHOQUES ELéTRICOS, MECâNICOS OU OUTROS.**

AVVERTENZA (IT)

- **IL PRESENTE MANUALE DI MANUTENZIONE è DISPONIBILE SOLTANTO IN INGLESE.**
- **SE UN ADDETTO ALLA MANUTENZIONE ESTERNO ALLA GEHC RICHIEDE IL MANUALE IN UNA LINGUA DIVERSA, IL CLIENTE è TENUTO A PROVVEDERE DIRETTAMENTE ALLA TRADUZIONE.**
- **SI PROCEDA ALLA MANUTENZIONE DELL’APPARECCHIATURA SOLO DOPO AVER CONSULTATO IL PRESENTE MANUALE ED AVERNE COMPRESO IL CONTENUTO.**
- **NON TENERE CONTO DELLA PRESENTE AVVERTENZA POTREBBE FAR COMPIERE OPERAZIONI DA CUI DERIVINO LESIONI ALL’ADDETTO ALLA MANUTENZIONE, ALL’UTILIZZATORE ED AL PAZIENTE PER FOLGORAZIONE ELETTRICA, PER URTI MECCANICI OD ALTRI RISCHI.**

HOIATUS (ET)

- **KÄESOLEV TEENINDUSJUHEND ON SAADAVAL AINULT INGLISE KEELES.**
- **KUI KLIENDITEENINDUSE OSUTAJA NõUAB JUHENDIT INGLISE KEELEST ERINEVAS KEELES, VASTUTAB KLIENT TõLKETEENUSE OSUTAMISE EEST.**
- **äRGE üRITAGE SEADMEID TEENINDADA ENNE EELNEVALT KäESOLEVA TEENINDUSJUHENDIGA TUTVUMIST JA SELLEST ARU SAAMIST.**
- **KäESOLEVA HOIATUSE EIRAMINE VõIB PõHJUSTADA TEENUSEOSUTAJA, OPERAATORI VõI PATSIENDI VIGASTAMIST ELEKTRILööGI, MEHAANILISE VõI MUU OHU TAGAJäRJEL.**

VAROITUS (FI)

- TÄMÄ HUOLTO-OHJE ON SAATAVILLA VAIN ENGLANNIKSI.
- JOS ASIAKKAAN PALVELUNTARJOAJA VAATII MUUTA KUIN ENGLANNINKIELISTÄ MATERIAALIA, TARVITTAVAN KÄÄNNÖKSEN HANKKIMINEN ON ASIAKKAAN VASTUULLA.
- ÄLÄ YRITÄ KORJATA LAITTEISTOA ENNEN KUIN OLET VARMASTI LUKENUT JA YMMÄRTÄNYT TÄMÄN HUOLTO-OHJEEN.
- MIKÄLI TÄTÄ VAROITUSTA EI NOUDATETA, SEURAUKSENA VOI OLLA PALVELUNTARJOAJAN, LAITTEISTON KÄYTTÄJÄN TAI POTILAAN VAHINGOITTUMINEN SÄHKÖISKUN, MEKAANISEN VIAN TAI MUUN VAARATILANTEEN VUOKSI.

ΠΡΟΕΙΔΟΠΟΙΗΣΗ (EL)

- ΤΟ ΠΑΡΟΝ ΕΓΧΕΙΡΙΔΙΟ ΣΕΡΒΙΣ ΔΙΑΤΙΘΕΤΑΙ ΣΤΑ ΑΓΓΛΙΚΑ ΜΟΝΟ.
- ΕΑΝ ΤΟ ΑΤΟΜΟ ΠΑΡΟΧΗΣ ΣΕΡΒΙΣ ΕΝΟΣ ΠΕΛΑΤΗ ΑΠΑΙΤΕΙ ΤΟ ΠΑΡΟΝ ΕΓΧΕΙΡΙΔΙΟ ΣΕ ΓΛΩΣΣΑ ΕΚΤΟΣ ΤΩΝ ΑΓΓΛΙΚΩΝ, ΑΠΟΤΕΛΕΙ ΕΥΘΥΝΗ ΤΟΥ ΠΕΛΑΤΗ ΝΑ ΠΑΡΕΧΕΙ ΥΠΗΡΕΣΙΕΣ ΜΕΤΑΦΡΑΣΗΣ.
- ΜΗΝ ΕΠΙΧΕΙΡΗΣΕΤΕ ΤΗΝ ΕΚΤΕΛΕΣΗ ΕΡΓΑΣΙΩΝ ΣΕΡΒΙΣ ΣΤΟΝ ΕΞΟΠΛΙΣΜΟ ΕΚΤΟΣ ΕΑΝ ΕΧΕΤΕ ΣΥΜΒΟΥΛΕΥΤΕΙ ΚΑΙ ΕΧΕΤΕ ΚΑΤΑΝΟΗΣΕΙ ΤΟ ΠΑΡΟΝ ΕΓΧΕΙΡΙΔΙΟ ΣΕΡΒΙΣ.
- ΕΑΝ ΔΕ ΛΑΒΕΤΕ ΥΠΟΨΗ ΤΗΝ ΠΡΟΕΙΔΟΠΟΙΗΣΗ ΑΥΤΗ, ΕΝΔΕΧΕΤΑΙ ΝΑ ΠΡΟΚΛΗΘΕΙ ΤΡΑΥΜΑΤΙΣΜΟΣ ΣΤΟ ΑΤΟΜΟ ΠΑΡΟΧΗΣ ΣΕΡΒΙΣ, ΣΤΟ ΧΕΙΡΙΣΤΗ Ή ΣΤΟΝ ΑΣΘΕΝΗ ΑΠΟ ΗΛΕΚΤΡΟΠΛΗΞΙΑ, ΜΗΧΑΝΙΚΟΥΣ Ή ΑΛΛΟΥΣ ΚΙΝΔΥΝΟΥΣ.

FIGYELMEZTETÉS (HU)

- EZEN KARBANTARTÁSI KÉZIKÖNYV KIZÁRÓLAG ANGOL NYELVEN ÉRHETŐ EL.
- HA A VEVŐ SZOLGÁLTATÓJA ANGOLTÓL ELTÉRŐ NYELVRE TART IGÉNYT, AKKOR A VEVŐ FELELŐSSÉGE A FORDÍTÁS ELKÉSZÍTTETÉSE.
- NE PRÓBÁLJA ELKEZDENI HASZNÁLNI A BERENDEZÉST, AMÍG A KARBANTARTÁSI KÉZIKÖNYVBEN LEÍRTAKAT NEM ÉRTELMEZTÉK.
- EZEN FIGYELMEZTETÉS FIGYELMEN KÍVÜL HAGYÁSA A SZOLGÁLTATÓ, MŰKÖDTETŐ VAGY A BETEG ÁRAMÜTÉS, MECHANIKAI VAGY EGYÉB VESZÉLYHELYZET MIATTI SÉRÜLÉSÉT EREDMÉNYEZHETI.

VIÐVÖRUN (IS)

- ÞESSI ÞJÓNUSTUHANDBÓK ER EINGÖNGU FÁANLEG Á ENSKU.
- EF ÞJÓNUSTUAÐILI VIÐSKIPTAMANNS ÞARFNAST ANNARS TUNGUMÁLS EN ENSKU, ER ÞAÐ Á ÁBYRGÐ VIÐSKIPTAMANNS AÐ ÚTVEGA ÞÝÐINGU.
- REYNIÐ EKKI AÐ ÞJÓNUSTA TÆKIÐ NEMA EFTIR AÐ HAFA SKOÐAÐ OG SKILIÐ ÞESSA ÞJÓNUSTUHANDBÓK.
- EF EKKI ER FARIÐ AÐ ÞESSARI VIÐVÖRUN GETUR ÞAÐ VALDIÐ MEIÐSLUM ÞJÓNUSTUVEITANDA, STJÓRNANDA EÐA SJÚKLINGS VEGNA RAFLOSTS, VÉLRÆNNAR EÐA ANNARRAR HÆTTU.

VÝSTRAHA (CS)

- TENTO SERVISNÍ NÁVOD EXISTUJE POUZE V ANGLICKÉM JAZYCE.
- V PŘÍPADĚ, ŽE POSKYTOVATEL SLUŽEB ZÁKAZNÍKŮM POTŘEBUJE NÁVOD V JINÉM JAZYCE, JE ZAJIŠTĚNÍ PŘEKLADU DO ODPOVÍDAJÍCÍHO JAZYKA ÚKOLEM ZÁKAZNÍKA.
- NEPROVÁDĚJTE ÚDRŽBU TOHOTO ZAŘÍZENÍ, ANIŽ BYSTE SI PŘEČETLI TENTO SERVISNÍ NÁVOD A POCHOPILI JEHO OBSAH.
- V PŘÍPADĚ NEDODRŽOVÁNÍ TÉTO VÝSTRAHY MŮŽE DOJÍT ÚRAZU ELEKTRICKÁM PROUDEM PRACOVNÍKA POSKYTOVATELE SLUŽEB, OBSLUŽNÉHO PERSONÁLU NEBO PACIENTŮ VLIVEM ELEKTRICKÉHOP PROUDU, RESPEKTIVE VLIVEM K RIZIKU MECHANICKÉHO POŠKOZENÍ NEBO JINÉMU RIZIKU.

ADVARSEL (DA)

- DENNE SERVICEMANUAL FINDES KUN PÅ ENGELSK.
- HVIS EN KUNDES TEKNIKER HAR BRUG FOR ET ANDET SPROG END ENGELSK, ER DET KUNDENS ANSVAR AT SØRGE FOR OVERSÆTTELSE.
- FORSØG IKKE AT SERVICERE UDSTYRET MEDMINDRE DENNE SERVICEMANUAL ER BLEVET LÆST OG FORSTÅET.
- MANGLENDE OVERHOLDELSE AF DENNE ADVARSEL KAN MEDFØRE SKADE PÅ GRUND AF ELEKTRISK, MEKANISK ELLER ANDEN FARE FOR TEKNIKEREN, OPERATØREN ELLER PATIENTEN.

WAARSCHUWING (NL)

- DEZE ONDERHOUDSHANDLEIDING IS ENKEL IN HET ENGELS VERKRIJGBAAR.
- ALS HET ONDERHOUDSPERSONEEL EEN ANDERE TAAL VEREIST, DAN IS DE KLANT VERANTWOORDELIJK VOOR DE VERTALING ERVAN.
- PROBEER DE APPARATUUR NIET TE ONDERHOUDEN VOORDAT DEZE ONDERHOUDSHANDLEIDING WERD GERAADPLEEGD EN BEGREPEN IS.
- INDIEN DEZE WAARSCHUWING NIET WORDT OPGEVOLGD, ZOU HET ONDERHOUDSPERSONEEL, DE OPERATOR OF EEN PATIËNT GEWOND KUNNEN RAKEN ALS GEVOLG VAN EEN ELEKTRISCHE SCHOK, MECHANISCHE OF ANDERE GEVAREN.

BRÎDINÂJUMS (LV)

- ŠĪ APKALPES ROKASGRĀMATA IR PIEEJAMA TIKAI ANGĻU VALODĀ.
- JA KLIENTA APKALPES SNIEDZĒJAM NEPIECIEŠAMA INFORMĀCIJA CITĀ VALODĀ, NEVIS ANGĻU, KLIENTA PIENĀKUMS IR NODROŠINĀT TULKOŠANU.
- NEVEICIET APRĪKOJUMA APKALPI BEZ APKALPES ROKASGRĀMATAS IZLASĪŠANAS UN SAPRAŠANAS.
- ŠĪ BRĪDINĀJUMA NEIEVĒROŠANA VAR RADĪT ELEKTRISKĀS STRĀVAS TRIECIENA, MEHĀNISKU VAI CITU RISKU IZRAISĪTU TRAUMU APKALPES SNIEDZĒJAM, OPERATORAM VAI PACIENTAM.

ĮSPĖJIMAS (LT)	• ŠIS EKSPLOATAVIMO VADOVAS YRA IŠLEISTAS TIK ANGLŲ KALBA. • JEI KLIENTO PASLAUGŲ TEIKĖJUI REIKIA VADOVO KITA KALBA – NE ANGLŲ, VERTIMU PASIRŪPINTI TURI KLIENTAS. • NEMĖGINKITE ATLIKTI ĮRANGOS TECHNINĖS PRIEŽIŪROS DARBŲ, NEBENT VADOVAUTUMĖTĖS ŠIUO EKSPLOATAVIMO VADOVU IR JĮ SUPRASTUMĖTE • NEPAISANT ŠIO PERSPĖJIMO, PASLAUGŲ TEIKĖJAS, OPERATORIUS AR PACIENTAS GALI BŪTI SUŽEISTAS DĖL ELEKTROS SMŪGIO, MECHANINIŲ AR KITŲ PAVOJŲ.
ADVARSEL (NO)	• DENNE SERVICEHÅNDBOKEN FINNES BARE PÅ ENGELSK. • HVIS KUNDENS SERVICELEVERANDØR TRENGER ET ANNET SPRÅK, ER DET KUNDENS ANSVAR Å SØRGE FOR OVERSETTELSE. • IKKE FORSØK Å REPARERE UTSTYRET UTEN AT DENNE SERVICEHÅNDBOKEN ER LEST OG FORSTÅTT. • MANGLENDE HENSYN TIL DENNE ADVARSELEN KAN FØRE TIL AT SERVICELEVERANDØREN, OPERATØREN ELLER PASIENTEN SKADES PÅ GRUNN AV ELEKTRISK STØT, MEKANISKE ELLER ANDRE FARER.
OSTRZEŻENIE (PL)	• NINIEJSZY PODRĘCZNIK SERWISOWY DOSTĘPNY JEST JEDYNIE W JĘZYKU ANGIELSKIM. • JEŚLI FIRMA ŚWIADCZĄCA KLIENTOWI USłUGI SERWISOWE WYMAGA UDOSTĘPNIENIA PODRĘCZNIKA W JĘZYKU INNYM NIŻ ANGIELSKI, OBOWIĄZEK ZAPEWNIENIA STOSOWNEGO TłUMACZENIA SPOCZYWA NA KLIENCIE. • NIE PRÓBOWAĆ SERWISOWAĆ NINIEJSZEGO SPRZĘTU BEZ UPRZEDNIEGO ZAPOZNANIA SIĘ Z PODRĘCZNIKIEM SERWISOWYM. • NIEZASTOSOWANIE SIĘ DO TEGO OSTRZEŻENIA MOżE GROZIĆ OBRAŻENIAMI CIAłA SERWISANTA, OPERATORA LUB PACJENTA W WYNIKU PORAŻENIA PRĄDEM, URAZU MECHANICZNEGO LUB INNEGO RODZAJU ZAGROŻEŃ.
ATENȚIE (RO)	• ACEST MANUAL DE SERVICE ESTE DISPONIBIL NUMAI ÎN LIMBA ENGLEZĂ. • DACĂ UN FURNIZOR DE SERVICII PENTRU CLIENȚI NECESITĂ O ALTĂ LIMBĂ DECÂT CEA ENGLEZĂ, ESTE DE DATORIA CLIENTULUI SĂ FURNIZEZE O TRADUCERE. • NU ÎNCERCAȚI SĂ REPARAȚI ECHIPAMENTUL DECÂT ULTERIOR CONSULTĂRII ŞI ÎNȚELEGERII ACESTUI MANUAL DE SERVICE. • IGNORAREA ACESTUI AVERTISMENT AR PUTEA DUCE LA RĂNIREA DEPANATORULUI, OPERATORULUI SAU PACIENTULUI ÎN URMA PERICOLELOR DE ELECTROCUTARE, MECANICE SAU DE ALTĂ NATURĂ.

ОСТОРОЖНО!
(RU)

- ДАННОЕ РУКОВОДСТВО ПО ОБСЛУЖИВАНИЮ ПРЕДОСТАВЛЯЕТСЯ ТОЛЬКО НА АНГЛИЙСКОМ ЯЗЫКЕ.
- ЕСЛИ СЕРВИСНОМУ ПЕРСОНАЛУ КЛИЕНТА НЕОБХОДИМО РУКОВОДСТВО НЕ НА АНГЛИЙСКОМ ЯЗЫКЕ, КЛИЕНТУ СЛЕДУЕТ САМОСТОЯТЕЛЬНО ОБЕСПЕЧИТЬ ПЕРЕВОД.
- ПЕРЕД ОБСЛУЖИВАНИЕМ ОБОРУДОВАНИЯ ОБЯЗАТЕЛЬНО ОБРАТИТЕСЬ К ДАННОМУ РУКОВОДСТВУ И ПОЙМИТЕ ИЗЛОЖЕННЫЕ В НЕМ СВЕДЕНИЯ.
- НЕСОБЛЮДЕНИЕ УКАЗАННЫХ ТРЕБОВАНИЙ МОЖЕТ ПРИВЕСТИ К ТОМУ, ЧТО СПЕЦИАЛИСТ ПО ТЕХОБСЛУЖИВАНИЮ, ОПЕРАТОР ИЛИ ПАЦИЕНТ ПОЛУЧАТ УДАР ЭЛЕКТРИЧЕСКИМ ТОКОМ, МЕХАНИЧЕСКУЮ ТРАВМУ ИЛИ ДРУГОЕ ПОВРЕЖДЕНИЕ.

UPOZORNENIE
(SK)

- TÁTO SERVISNÁ PRÍRUČKA JE K DISPOZÍCII LEN V ANGLIČTINE.
- AK ZÁKAZNÍKOV POSKYTOVATEĽ SLUŽIEB VYŽADUJE INÝ JAZYK AKO ANGLIČTINU, POSKYTNUTIE PREKLADATEĽSKÝCH SLUŽIEB JE ZODPOVEDNOSŤOU ZÁKAZNÍKA.
- NEPOKÚŠAJTE SA VYKONÁVAŤ SERVIS ZARIADENIA SKÔR, AKO SI NEPREČÍTATE SERVISNÚ PRÍRUČKU A NEPOROZUMIETE JEJ.
- ZANEDBANIE TOHTO UPOZORNENIA MÔŽE VYÚSTIŤ DO ZRANENIA POSKYTOVATEĽA SLUŽIEB, OBSLUHUJÚCEJ OSOBY ALEBO PACIENTA ELEKTRICKÝM PRÚDOM, PRÍPADNE DO MECHANICKÉHO ALEBO INÉHO NEBEZPEČENSTVA.

VARNING
(SV)

- **DEN HÄR SERVICEHANDBOKEN FINNS BARA TILLGÄNGLIG PÅ ENGELSKA.**
- **OM EN KUNDS SERVICETEKNIKER HAR BEHOV AV ETT ANNAT SPRÅK ÄN ENGELSKA ANSVARAR KUNDEN FÖR ATT TILLHANDAHÅLLA ÖVERSÄTTNINGSTJÄNSTER.**
- **FÖRSÖK INTE UTFÖRA SERVICE PÅ UTRUSTNINGEN OM DU INTE HAR LÄST OCH FÖRSTÅR DEN HÄR SERVICEHANDBOKEN.**
- **OM DU INTE TAR HÄNSYN TILL DEN HÄR VARNINGEN KAN DET RESULTERA I SKADOR PÅ SERVICETEKNIKERN, OPERATÖREN ELLER PATIENTEN TILL FÖLJD AV ELEKTRISKA STÖTAR, MEKANISKA FAROR ELLER ANDRA FAROR.**

DİKKAT
(TR)

- BU SERVİS KILAVUZU YALNIZCA İNGİLİZCE OLARAK SAĞLANMIŞTIR.
- EĞER MÜŞTERİ TEKNİSYENİ KILAVUZUN İNGİLİZCE DIŞINDAKİ BİR DİLDE OLMASINI İSTERSE, KILAVUZU TERCÜME ETTİRMEK MÜŞTERİNİN SORUMLULUĞUNDADIR.
- SERVİS KILAVUZUNU OKUYUP ANLAMADAN EKİPMANLARA MÜDAHALE ETMEYİNİZ.
- BU UYARININ GÖZ ARDI EDİLMESİ, ELEKTRİK ÇARPMASI YA DA MEKANİK VEYA DİĞER TÜRDEN KAZALAR SONUCUNDA TEKNİSYENİN, OPERATÖRÜN YA DA HASTANIN YARALANMASINA YOL AÇABİLİR.

警告
(JA)

このサービスマニュアルには英語版しかありません。
GEHC 以外でサービスを担当される業者が英語以外の言語を要求される場合、翻訳作業はその業者の責任で行うものとさせていただきます。
このサービスマニュアルを熟読し理解せずに、装置のサービスを行わないで下さい。
この警告に従わない場合、サービスを担当される方、操作員あるいは患者さんが、感電や機械的又はその他の危険により負傷する可能性があります。

注意：
(ZH-CN)

本维修手册仅存有英文本。
非 GEHC 公司的维修员要求非英文本的维修手册时，客户需自行负责翻译。
未详细阅读和完全了解本手册之前，不得进行维修。
忽略本注意事项会对维修员，操作员或病人造成触电，机械伤害或其他伤害。

경고
(KO)

- 본 서비스 지침서는 영어로만 이용하실 수 있습니다.
- 고객의 서비스 제공자가 영어이외 언어를 요구할 경우, 번역 서비스 지침서를 제공하는 것은 고객의 책임입니다.
- 본 서비스 지침서를 지참했고 이해하지 않는 한은 해당 장비를 수리를 시도하지 마십시오.
- 이 경우에 유해하지 않은 전기쇼크, 기계상의 혹은 다른 위험으로부터 서비스 제공자, 운영자 혹은 환자에게 위험을 가할 수 있습니다.

DAMAGE IN TRANSPORTATION

All packages should be closely examined at time of delivery. If damage is apparent write "Damage In Shipment" on ALL copies of the freight or express bill BEFORE delivery is accepted or "signed for" by a GE representative or hospital receiving agent. Whether noted or concealed, damage MUST be reported to the carrier immediately upon discovery, or in any event, within 14 days after receipt, and the contents and containers held for inspection by the carrier. A transportation company will not pay a claim for damage if an inspection is not requested within this 14 day period.

CERTIFIED ELECTRICAL CONTRACTOR STATEMENT - FOR USA ONLY

All electrical Installations that are preliminary to positioning of the equipment at the site prepared for the equipment shall be performed by licensed electrical contractors. Other connections between pieces of electrical equipment, calibrations and testing shall be performed by qualified GE Healthcare personnel. In performing all electrical work on these products, GE will use its own specially trained field engineers. All of GE's electrical work on these products will comply with the requirements of the applicable electrical codes.

The purchaser of GE equipment shall only utilize qualified personnel (i.e., GE's field engineers, personnel of third-party service companies with equivalent training, or licensed electricians) to perform electrical servicing on the equipment.

OMISSIONS & ERRORS

If there are any omissions, errors or suggestions for improving this documentation, please contact the GE Healthcare Service Documentation Group with specific information listing the system type, manual title, part number, revision number, page number and suggestion details.
Mail the information to:Service Documentation, 65-1, Sangdaewon-dong,Jungwon-gu, Seongnam-si,Gyeonggi-do 462-120, Korea.

SERVICE SAFETY CONSIDERATIONS

DANGER **DANGEROUS VOLTAGES, CAPABLE OF CAUSING DEATH, ARE PRESENT IN THIS EQUIPMENT. USE EXTREME CAUTION WHEN HANDLING, TESTING AND ADJUSTING.**

WARNING ***Use all Personal Protection Equipment (PPE) such as gloves, safety shoes, safety glasses, and kneeling pad, to reduce the risk of injury.***

LEGAL NOTES

TRADEMARKS

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Revision History

Revision	Date	Reason for change
1	February 2011	Initial Release
2	Mar 2011	General update
3	May 2011	Printer update
4	September 2011	Safety test procedure update
5	August 2012	System info figures update due to SW version naming change

List of Effected Pages

Pages	Revision	Pages	Revision	Pages	Revision

CHAPTER 1
Introduction

CHAPTER 2
Site Preparation

CHAPTER 3
Setup Instructions

CHAPTER 4
Functional Checks

CHAPTER 5
Components and Functions (Theory)

CHAPTER 6
Service Adjustments

CHAPTER 7
Diagnostics/Troubleshooting

CHAPTER 8
Replacement Procedures

CHAPTER 9
Renewal Parts

CHAPTER 10
Care & Maintenance

Acoustic Output

Chapter 1
Introduction

Section 1-1
Overview

1-1-1 Purpose of Chapter 1

This chapter describes important issues related to safely servicing the **Voluson® S8** and/or **Voluson® S6** ultrasound system. The service provider must read and understand all the information presented in this manual before installing or servicing a unit.

Table 1-1 Contents in Chapter 1

1-1-2 Purpose of Service Manual

NOTICE *This Service Manual is valid for **Voluson® S8** and **Voluson® S6** ultrasound systems.*

This Service Manual provides installation and service information for Voluson® S8 and/or Voluson® S6 Ultrasound Scanning System and contains the following chapters:

1.) **Chapter 1 - Introduction:** Contains a content summary and warnings.
2.) **Chapter 2 - Site Preparation:** Contains pre-installation requirements.
3.) **Chapter 3 - Setup Instructions:** Contains setup and installation procedures.
4.) **Chapter 4 - Functional Checks:** Contains functional checks that are recommended as part of the installation, or as required during servicing and periodic maintenance.
5.) **Chapter 5 - Components and Functions (Theory):** Contains block diagrams and functional explanations of the electronics.
6.) **Chapter 6 - Service Adjustments:** Contains instructions on how to make available adjustments.
7.) **Chapter 7 - Diagnostics/Troubleshooting:** Provides procedures for running diagnostic or related routines.
8.) **Chapter 8 - Replacement Procedures:** Provides disassembly procedures and reassembly procedures for all changeable Field Replaceable Units (FRU).
9.) **Chapter 9 - Renewal Parts:** Contains a complete list of field replaceable parts.
10.) **Chapter 10 - Care & Maintenance:** Provides periodic maintenance procedures.

1-1-3 Typical Users of the Basic Service Manual

- GE Service Personnel (installation, maintenance, etc.).
- Hospital's Service Personnel
- Contractors (Some parts of Chapter 2 - Pre-Installation)

1-1-4 Models Covered by this Manual

Table 1-2 Voluson® S8 - Model Designations

Part Number	Description
5407585	Voluson® S8 Console, EMEA
5407592	Voluson® S8 Console, LA
5407589	Voluson® S8 Console, Global, USA/CANADA
5407588	Voluson® S8 Console, JAPAN
5407586	Voluson® S8 Console, INDIA
5407590	Voluson® S8 Console, APAC

Table 1-3 Voluson® S6 - Model Designations

Part Number	Description
5407431	Voluson® S6 Console, EMEA
5408710	Voluson® S6 Console, LA
5407591	Voluson® S6 Console, IVF
5407434	Voluson® S6 Console, USA/CANADA
5407593	Voluson® S6 Console, ARM
5407433	Voluson® S6 Console, JAPAN
5407432	Voluson® S6 Console, INDIA
5407436	Voluson® S6 Console, APAC

1-1-5 Purpose of Operator Manual(s)

The Operator Manual(s) should be fully read and understood before operating the Voluson® S8 and/or Voluson® S6 and also kept near the unit for quick reference.

Section 1-2
Important Conventions

1-2-1 Conventions Used in this Manual

Model Designations

This manual covers the Voluson® S8 / Voluson® S6 ultrasound units listed on page 1-2.

Icons

Pictures, or icons, are used wherever they reinforce the printed message. The icons, labels and conventions used on the product and in the service information are described in this chapter.

Safety Precaution Messages

Various levels of safety precaution messages may be found on the equipment and in the service information. The different levels of concern are identified by a flag word that precedes the precautionary message. Known or potential hazards are labeled in one of following ways:

DANGER **INDICATES THE PRESENCE OF A HAZARD THAT WILL CAUSE SEVERE PERSONAL INJURY OR DEATH IF THE INSTRUCTIONS ARE IGNORED.**

WARNING ***INDICATES THE PRESENCE OF A HAZARD THAT CAN CAUSE SEVERE PERSONAL INJURY AND PROPERTY DAMAGE IF INSTRUCTIONS ARE IGNORED.***

CAUTION **Indicates the presence of a hazard that will or can cause minor personal injury and property damage if instructions are ignored.**

NOTICE **Equipment Damage Possible**

Notice is used when a hazard is present that can cause property damage but has absolutely no personal injury risk.

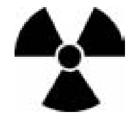
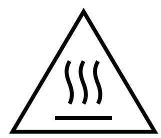
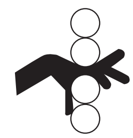
Example: Disk drive will crash.

NOTE: Notes provide important information about an item or a procedure.
Information contained in a NOTE can often save you time or effort.

1-2-2 Standard Hazard Icons

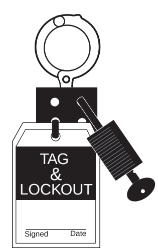
Important information will always be preceded by the exclamation point contained within a triangle, as seen throughout this chapter. In addition to text, several different graphical icons (symbols) may be used to make you aware of specific types of hazards that could cause harm. Even if a symbol isn't used in this manual, it is included for your reference.

Table 1-4 Standard Hazard Icons

ELECTRICAL	MECHANICAL	RADIATION
		
LASER	**HEAT**	**PINCH**
		

Other hazard icons make you aware of specific procedures that should be followed.

Table 1-5 Standard Icons Indicating a Special Procedure be Used

AVOID STATIC ELECTRICITY	TAG AND LOCK OUT	WEAR EYE PROTECTION
		 or 
WEAR HAND PROTECTION	**WEAR FOOT PROTECTION**	
		

1-2-3 Product Icons

The following table describes the purpose and location of safety labels and other important information provided on the equipment.

Table 1-6 Product Icons

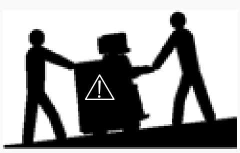
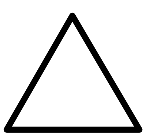
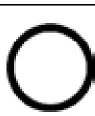
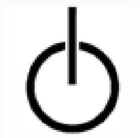
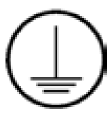
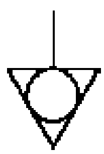
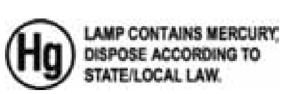
LABEL/SYMBOL	PURPOSE/MEANING	LOCATION
Identification and Rating Plate	Manufacturer's name and address Model and serial numbers Electrical ratings	Rear side of the unit On each probe
Device Listing/Certification Labels	Laboratory logo or labels denoting conformance with industry safety standards such as UL or IEC.	Rear side of the unit
CE xxxx	Council Directive 93/42/EEC concerning medical devices: The CE mark affixed to the equipment testifies compliance to the directive.	Rear side of the unit On each probe
IP Code (IPX 1) IP Code (IPX 7)	Indicates the degree of protection provided by the enclosure per IEC 60529. IPX 1 - protected against dripping water IPX 7 - protected against the effects of immersion	Footswitch Probes
"CAUTION This unit weighs... Special care must be used to avoid..." 	This precaution is intended to prevent injury that may result if one person attempt to move the unit considerable distances or on an incline due to the weight of the unit.	Used in the Service and User Manual which should be adjacent to equipment at all times for quick reference.
"DANGER - Risk of explosion used in..."	The system is not designed for use with flammable anesthetic gases.	Indicated in the Service Manual.
	"CAUTION" The equilateral triangle is usually used in combination with other symbols to advise or warn the user.	various
	ATTENTION - Consult accompanying documents " is intended to alert the user to refer to the operator manual or other instructions when complete information cannot be provided on the label.	Rear side of Power Supply
	"CAUTION - Dangerous voltage" (the lightning flash with arrowhead in equilateral triangle) is used to indicate electric shock hazards.	various
	"Mains OFF" Indicates the power off position of the mains power switch.	rear of system at mains switch

Table 1-6 Product Icons (Continued)

LABEL/SYMBOL	PURPOSE/MEANING	LOCATION
	"OFF/Standby" Indicates the power off/standby position of the power switch. **CAUTION** **This Power Switch DOES NOT ISOLATE Mains Supply**	Adjacent to On-Off/Standby switch left below the Control panel.
	"Mains ON" Indicates the power on position of the mains power switch.	Rear of system at mains switch
	"Protective Earth" Indicates the protective earth (grounding) terminal.	Rear of system at mains switch (on primary power supply)
	"Equipotentiality" Indicates the terminal to be used for connecting equipotential conductors when interconnecting (grounding) with other equipment.	Rear of system at mains switch (on primary power supply)
	Waste Electrical and Electronic Equipment (WEEE) Disposal. This symbol indicates that waste electrical and electronic equipment must not be disposed as unsorted municipal waste and must be collected separately. Please contact an authorized representative of the manufacturer for information concerning the decommissioning of your equipment.	Rear side of the unit On the plug of each probe
	These symbols indicate that at least one of the six hazardous substances of the China RoHS Labelling Standard is above the RoHS limitation. The number inside the circle is referred to as the Environmental Friendly Use Period (EFUP). It indicates the number of years that the product, under normal use, will remain harmless to health of humans or the environment. EFUP = 10 for Short Use Products EFUP = 20 for Medium Use Products	Rear side of the unit On the plug of each probe
	This product consists of devices that may contain mercury, which must be recycled or disposed of in accordance with local, state, or country laws. (Within this system, the backlight lamps in the monitor and contain mercury.)	Rear side of the unit not visible: - below the cover on read side of Monitor
	Loading prohibited	at top cover of the system

Section 1-3
Safety Considerations

1-3-1 Introduction

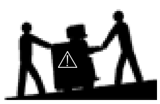
The following safety precautions must be observed during all phases of operation, service and repair of this equipment. Failure to comply with these precautions or with specific warnings elsewhere in this manual, violates safety standards of design, manufacture and intended use of the equipment.

1-3-2 Human Safety

Operating personnel must not remove the system covers.
Servicing should be performed by authorized personnel only. Only personnel who have participated in a Voluson® S8 / Voluson® S6 Training are authorized to service the equipment.

1-3-3 Mechanical Safety

CAUTION **The Voluson® S8 / Voluson® S6 weighs 90 kg or more, depending on installed peripherals, (200 lbs., or more) when ready for use.**



Care must be used when moving it or replacing its parts. Failure to follow the precautions listed could result in injury, uncontrolled motion and costly damage.

ALWAYS:

• Use the handle to move the system. • Be sure the pathway is clear.
• Use slow, careful motions. • Do not let the system strike walls or door frames.

Two people are required when moving on inclines or lifting more than 16 kg (35 lbs).

WARNING ***USE EXTREME CAUTION WHEN ELEVATING THE UNIT, OR IF IT IS RAISED FOR A REPAIR OR MOVED ALONG ANY INCLINE. THE VOLUSON® S8 / VOLUSON® S6 SYSTEM MAY BECOME UNSTABLE WHICH COULD CAUSE A TIP OVER.***

WARNING ***ULTRASOUND PROBES ARE HIGHLY SENSITIVE MEDICAL INSTRUMENTS THAT CAN EASILY BE DAMAGED BY IMPROPER HANDLING. USE CARE WHEN HANDLING AND PROTECT FROM DAMAGE WHEN NOT IN USE. DO NOT USE A DAMAGED OR DEFECTIVE PROBE. FAILURE TO FOLLOW THESE PRECAUTIONS CAN RESULT IN SERIOUS INJURY AND EQUIPMENT DAMAGE.***

WARNING ***NEVER USE A PROBE THAT HAS FALLEN TO THE FLOOR.
EVEN IF IT LOOKS OK, IT MAY BE DAMAGED.***

CAUTION **Always lower and center the Operator I/O Panel before moving the scanner.**

CAUTION **Before you move or transport the system, make sure to lock the LCD monitor firmly and flip down the monitor to prevent damage to the system.**

NOTE: Special care should be taken when transporting the unit in a vehicle:

- *Eject any DVD/CD from the drive.*
- *Place the probes in their carrying cases.*
- *DO NOT use the Control Panel as an anchor point.*
- *Secure the systems with straps in an upright position and lock the caster wheels (brake).*
- Ensure that the Voluson® S8 / Voluson® S6 system is firmly secured while inside the vehicle.
- Prevent vibration damage by driving cautiously. Avoid unpaved roads, excessive speeds, and erratic stops or starts.

1-3-4 Electrical Safety

1-3-4-1 Safe Practices

To minimize shock hazard, the equipment chassis must be connected to an electrical ground.
The system is equipped with a three-conductor AC power cable. This must be plugged into an approved electrical outlet with safety ground. If an extension cord is used with the system, make sure that the total current rating of the system does not exceed the extension cord rating.

The power outlet used for this equipment should not be shared with other types of equipment.
Both the system power cable and the power connector meet international electrical standards.

1-3-4-2 Probes

All the probes for the Voluson® S8 / Voluson® S6 are designed and manufactured to provide trouble-free, reliable service. To ensure this, correct handling of probes is important and the following points should be noted:

- Do not drop a probe or strike it against a hard surface, as this may damage the transducer elements, acoustic lens, or housing.
- Inspect the probe prior to each use for damage or degradation to the Housing, Cable strain relief, Lens and Seal.
- Do not use a cracked or damaged probe. In this event, call your field service representative immediately to obtain a replacement.
- Avoid pulling, pinching or kinking the probe cable, since a damaged cable may compromise the electrical safety of the probe.
- To avoid the risk of a probe accidentally falling, do not allow the probe cables to become entangled, or to be caught in the machine's wheels.
- Never immerse the probe connector or adapter into any liquid.

NOTE: For detailed information on handling probes, refer to the Voluson® S8 / Voluson® S6 Basic User Manual and the care card supplied with the probe.

1-3-5 Auxiliary Devices Safety

WARNING ***Power Supplies for additional equipment MUST comply with IEC 60601-1.***

WARNING ***DO NOT attempt to use different peripherals and accessories (brand and model; connected via USB ports) other than approved and provided by GE Healthcare!***
The ultrasound system is an extremely sensitive and complex medical system.
Any unauthorized peripherals may cause system failure or damage!

The Voluson® S8 / Voluson® S6 is equipped with an isolation transformer to provide the required separation from mains for both, the system and the auxiliary devices.
One AUX main outlet is located at the primary power supply. It is used for connecting the threefold splitter whose outlets are led to the shelves intend for auxiliary devices (e.g., printers) and the AUX main outlet that is accessible on the back of the control console.

The IEC 60601-1-1 standard provides a guideline for safely interconnecting medical devices in systems.
"Equipment connected to the analog or digital interface must comply with the respective IEC/UL standards (e.g. IEC 60950 / UL 60950 for data processing equipment and IEC 60601-1 / UL 60601-1 for medical equipment).

1-3-5 Auxiliary Devices Safety (cont'd)

Everybody who connects additional equipment to the signal input portion or signal output portion configures a medical system, and is therefore responsible that the system complies with the requirements of the system standard IEC 60601-1-1.

Special care has to be taken, if the device is connected to computer network (e.g., Ethernet), because other devices could be connected without any control. There could be a potential difference between the protective earth and any line of the computer network including the shield.

In this case the only way to operate the system safely is to use an isolated signal link with minimum 4mm creepage distance, 2.5mm air clearance of the isolation device. For computer networks there are media converters available which convert the electrical to optical signals. Please consider that this converter has to comply with IEC xxx standards***** and is battery operated or connected to the isolation mains output of the Voluson® S8 / Voluson® S6 ultrasound system.

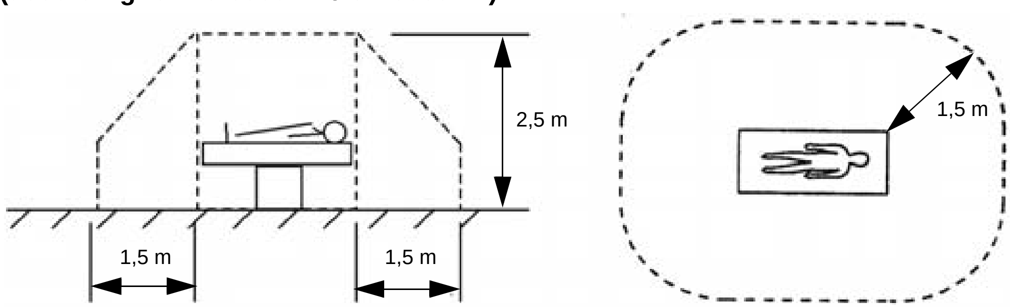
***** IEC xxx stands for standards such as:

- IEC 60601 for medical devices
- IEC 60950 for information technology equipment etc.

NOTICE **The system integrator** (any person connecting the medical device to other devices) **is responsible that the connections are safe.**
If in doubt, consult the technical service department or your local representative.

CAUTION **The leakage current of the entire system including any / all auxiliary equipment must not exceed the limit values as per EN 60601-1-1:1990 (IEC 60601-1-1) respectively other valid national or international standards. All equipment must comply with UL, CSA and IEC requirements.**

CAUTION **Please observe that some printers may not be medical devices! If the Bluetooth Printer and/or Line Printers are no medical devices, they have to be located outside of the patient environment (according to IEC 60601-1 / UL 60601-1).**



CAUTION **Auxiliary equipment must only be connected to the main console with the special main outlet provided for the electrical safety of the system.**

CAUTION **Auxiliary equipment with direct main connection requires galvanic separation of the signal and/ or control leads.**

For hardware installation procedures see: Chapter 3 - Connection of Auxiliary Devices, on page 3-11.

WARNING ***After each installation, the leakage currents have to be measured according to IEC 60601-1 respectively UL 60601-1.***

NOTICE All peripherals mounted on the Voluson® S8 / Voluson® S6 system chassis must be firmly secured in position.

1-3-6 Labels Locations

The Voluson® S8 / Voluson® S6 ultrasound system comes equipped with product labels and icons. These labels and icons represent pertinent information regarding the operation of the unit.

Figure 1-1 Labeling (on rear of the Voluson® S8 / Voluson® S6 system)

1-3-6-1 Main Label

. The Main Label is located on the rear of the Voluson® S8 / Voluson® S6 system.

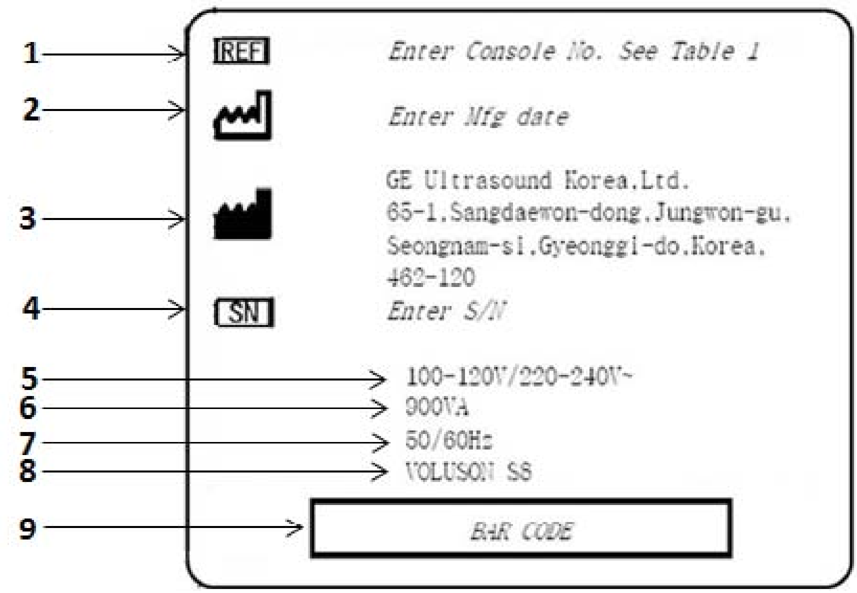


Figure 1-2 Main Label (located on left rear of Voluson® S8 / Voluson® S6)

1	Console Part No.	6	Power Consumption nominal
2	Manufacturing date	7	Frequency
3	Manufacturer	8	Product name
4	System Serial Number	9	Bar Code
5	System Voltage Setting		

1-3-6-2 UL Label

The UL label is located below the main label.

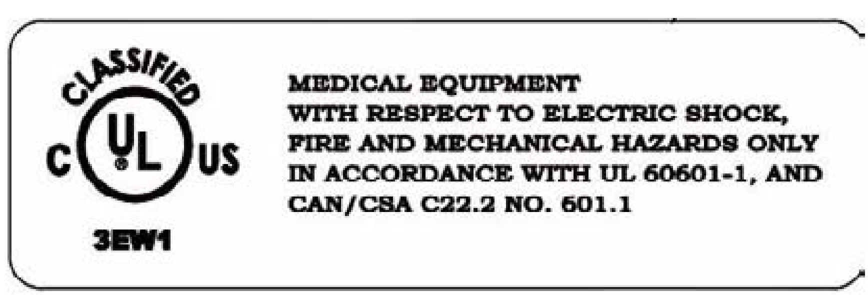


Figure 1-3 UL Label

1-3-6-3 Multi Caution Label

The Multi caution label is located on the rear of the Voluson S8/Voluson S6 system

Figure 1-4 Multi-Caution Label

1	**Symbol “Follow instructions for use”**
2	**Symbol “Do not use the following devices near this system”**
3	**Symbol “Pushing prohibited’**
4	**Symbol “RoHS mark”**
5	**CE mark**
6	**Rx Only mark**
7	**WEEE Disposal Icon**
8	**Transportation position instruction**
9	**Caution**

1-3-7 Dangerous Procedure Warnings

Warnings, such as the examples below, precede potentially dangerous procedures throughout this manual. Instructions contained in the warnings must be followed.

DANGER **DANGEROUS VOLTAGES, CAPABLE OF CAUSING DEATH, ARE PRESENT IN THIS EQUIPMENT.**
USE EXTREME CAUTION WHEN HANDLING, TESTING AND ADJUSTING.

WARNING ***EXPLOSION WARNING***

DO NOT OPERATE THE EQUIPMENT IN AN EXPLOSIVE ATMOSPHERE. OPERATION OF ANY ELECTRICAL EQUIPMENT IN SUCH AN ENVIRONMENT CONSTITUTES A DEFINITE SAFETY HAZARD.

WARNING ***DO NOT SUBSTITUTE PARTS OR MODIFY EQUIPMENT***

BECAUSE OF THE DANGER OF INTRODUCING ADDITIONAL HAZARDS, DO NOT INSTALL SUBSTITUTE PARTS OR PERFORM ANY UNAUTHORIZED MODIFICATION OF THE EQUIPMENT.

1-3-8 Lockout/Tagout Requirements (For USA Only)

Follow OSHA Lockout/Tagout requirements to protect service personnel from injuries caused by unexpected energizing or start-up of equipment during service, repair, or maintenance.

NOTICE Energy Control and Power Lockout for Voluson® S8 / Voluson® S6.

When servicing parts of the system where there is exposure to voltage greater than 30 Volts:
Unplug the system.
Maintain control of the system power plug.
There are no test points to verify isolation, you must wait for at least 20 seconds for capacitors to discharge.

Beware that the Power Supply, Front End Processor and Back End Processor may be energized even if the power is turned off when the cord is still plugged into the AC Outlet.

1-3-9 Returning/Shipping System, Probes and Repair Parts

When returning or shipping the Voluson® S8 / Voluson® S6 system in the original packaging:

- system must be lowered to its minimum height with monitor flapped down (see Figure on Figure 3-5)
- the Control Console has to be centered and locked in “unextended” position

NOTE: For Control Console Positioning refer to 4-7-1 on page 4-53.

Equipment being returned must be clean and free of blood and other infectious substances.

GEHC policy states that body fluids must be properly removed from any part or equipment prior to shipment. GEHC employees, as well as customers, are responsible for ensuring that parts/equipment have been properly decontaminated prior to shipment. Under no circumstance should a part or equipment with visible body fluids be taken or shipped from a clinic or site (for example, body coils or and ultrasound probe).

The purpose of the regulation is to protect employees in the transportation industry, as well as the people who will receive or open this package.

1-3-9 Returning/Shipping System, Probes and Repair Parts (cont'd)

NOTE: The US Department of Transportation (DOT) has ruled that "items what were saturated and/or dripping with human blood that are now caked with dried blood; or which were used or intended for use in patient care" are "regulated medical waste" for transportation purpose and must be transported as a hazardous material.

Section 1-4
Electromagnetic Compatibility (EMC)

1-4-1 What is EMC?

Electromagnetic compatibility describes a level of performance of a device within its electromagnetic environment. This environment consists of the device itself and its surroundings including other equipment, power sources and persons with which the device must interface. Inadequate compatibility results when a susceptible device fails to perform as intended due interference from its environment or when the device produces unacceptable levels of emission to its environment. This interference is often referred to as radio–frequency or electromagnetic interference (RFI/EMI) and can be radiated through space or conducted over interconnecting power of signal cables. In addition to electromagnetic energy, EMC also includes possible effects from electrical fields, magnetic fields, electrostatic discharge and disturbances in the electrical power supply.

For applicable standards please refer to Chapter 2 in the Basic User Manual of the Voluson® S8 / Voluson® S6 ultrasound system.

1-4-2 Compliance

The Voluson® S8 / Voluson® S6 unit conforms to all applicable conducted and radiated emission limits and to immunity from electrostatic discharge, radiated and conducted RF fields, magnetic fields and power line transient requirements as mentioned in IEC 60601-1-2.

NOTE: For CE Compliance, it is critical that all covers, screws, shielding, gaskets, mesh, clamps, are in good condition, installed tightly without skew or stress. Proper installation following all comments noted in this service manual is required in order to achieve full EMC performance.

1-4-3 Electrostatic Discharge (ESD) Prevention

WARNING ***DO NOT touch any boards with integrated circuits prior to taking the necessary ESD precautions:***

***1.) When installing boards, ESD may cause damage to a board.
ALWAYS connect yourself, via an arm-wrist strap, to the advised ESD connection point located on the rear of the system (to the right of the power connector).***

2.) Follow general guidelines for handling of electrostatic sensitive equipment.

WARNING ***Risk of electrical shock: System must be turned off.
Avoid all contact with electrical contacts, conductors and components.
Always use non-conductive handles designed for the removal and replacement of ESD sensitive parts. All parts that have the potential for storing energy must be discharged or isolated before making contact.***

Section 1-5
Customer Assistance

1-5-1 Contact Information

If this equipment does not work as indicated in this service manual or in the Basic User Manual, or if you require additional assistance, please contact the local distributor or appropriate support resource, as listed below.

NOTE: Prepare vital system information (see: Section 7-2 on page 7-2) before you call:

- System Type
- System Serial number (also visible on label on back of the system)
- Application Software version
- Backup version
- additional information about installed software

Table 1-7 Phone Numbers for Customer Assistance

Location	Phone Number	
USA GE Medical Systems Ultrasound Service Engineering 9900 Innovation Drive (RP-2123) Wauwatosa, WI 53226, USA	Service On-site Service: Parts Applications support	1-800–437–1171 1-800-558-2040 1-800-682-5327 or 1-262-524-5698
Canada		1-800-668-0732
Latin America	Service Applications support	1-800-321-7937 1-262-524-5698
Europe GE Ultraschall Deutschland GmbH Beethovenstraße 239 Postfach 11 05 60, D-42655 Solingen Germany	OLC - EMEA (Europe, Middle East & Africa) Phone: +49 (0) 212 2802 - 652 (-OLC) +33 1 3083 1300 (English/German all segments incl. training) Fax: +49 (0) 212 2802 - 431	
Online Services Ultrasound Asia Australia China India Japan Korea Singapore	Phone: +(61) 1-800-647-855 +(86) 800-810-8188 +(91) 1-800-11-4567 +(81) 42-648-2924 +(82) 2-6201-3585 +(95) 6277-3444	

1-5-2 System Manufacturer

Table 1-8 System Manufacturer

Manufacturer	FAX Number
GE Ultrasound Korea 65-1, Sangdaewon-dong, Jungwon-gu, Seongnam-Si, Gyeonggi-do 462-120 Korea	+82 (0) 31-740-6436

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Chapter 2
Site Preparation

Section 2-1
Overview

2-1-1 Purpose of Chapter 2

This chapter provides the information required to plan and prepare for the installation of a Voluson® S8 / Voluson® S6 ultrasound unit. Included are descriptions of the facility and electrical needs to be met by the purchaser.

Table 2-1 Contents in Chapter 2

Section 2-2
General Console Requirements

2-2-1 Environmental Requirements

Table 2-2 Environmental Requirements

Operating Temperature	Operating Humidity	Heat Dissipation	Storage Temperature	Storage Humidity
18 to 30°C (64 to 86°F)	30 to 80% rH non-condensing	S6 : 680 BTU/hour S8 : 780 BTU/hour without on-board peripherals	-10 to 50 °C (14 to 122°F)	30~ 80% rH non-condensing

CAUTION If the system has been in storage or has been transported, please see the acclimation requirements *before* powering ON and/or using the system (see: Section 3-2-2 "Installation Warnings" on page 3-2).

2-2-1-1 Cooling

The cooling requirement for the Voluson® S8 / Voluson® S6 is 780/680 BTU/hr. This figure does not include cooling needed for lights, people, or other equipment in the room.

NOTE: Each person in the room places an additional 300 BTU/hr. demand on the cooling system.

2-2-1-2 Lighting

Bright light is needed for system installation, updates and repairs. However, operator and patient comfort may be optimized if the room light is subdued and indirect. Therefore a combination lighting system (dim/bright) is recommended. Keep in mind that lighting controls and dimmers can be a source of EMI which could degrade image quality. These controls should be selected to minimize possible interference.

2-2-2 Electrical Requirements

NOTE: GE Healthcare requires a dedicated power and ground for the proper operation of its Ultrasound equipment. This dedicated power shall originate at the last distribution panel before the system.

The dedicated line shall consist of one phase, a neutral (not shared with any other circuit), and a full size Ground wire from the distribution panel to the Ultrasound outlet.

NOTE: Please note that image artifacts can occur, if at any time within the facility, the Ground from the main facility's incoming power source to the Ultrasound unit is only a conduit.

2-2-2-1 Voluson® S8 / Voluson® S6 Power Requirements

Table 2-3 Electrical Specifications for Voluson® S8 / Voluson® S6

Voltage	Tolerances	Current	Frequency
100 - 130 VAC	±10%	9.0 ... 7.0 A	50, 60 Hz (±2%)
220 - 240 VAC	±10%	4.0 ... 3.7 A	50, 60 Hz (±2%)

Power Consumption nominal 900 VA including all on-board peripherals.

2-2-2-2 Inrush Current

Inrush current is not a factor to consider due to the inrush current limiting properties of the power supplies.

2-2-2-3 Site Circuit Breaker

It is recommended that the branch circuit breaker for the machine be readily accessible.

CAUTION **POWER OUTAGE MAY OCCUR.**

The Voluson® S8 / Voluson® S6 requires a dedicated single branch circuit. To avoid circuit overload and possible loss of critical care equipment, make sure you DO NOT have any other equipment operating on the same circuit.

2-2-2-4 Site Power Outlets

A dedicated AC power outlet must be within reach of the unit without extension cords. Other adequate outlets for the external peripherals, medical and test equipment needed to support this unit must also be present within 1 m (3.2 ft.) of the unit. Electrical installation must meet all current local, state, and national electrical codes.

2-2-2-5 Main Power Plug

The Voluson® S8 / Voluson® S6 ultrasound system is supplied with a main power plug, as standard. In the event that the unit arrives without a power plug, or with the wrong plug, contact your GE dealer. When necessary, the installation engineer will supply the appropriate power plug to meet the applicable local regulations.

2-2-3 EMI Limitations

Ultrasound systems are susceptible to Electromagnetic Interference (EMI) from radio frequencies, magnetic fields, and transients in the air or wiring. Ultrasound machines also generate EMI.
The Voluson® S8 / Voluson® S6 complies with limits as stated on the EMC label. However, there is no guarantee that interference will not occur in a particular installation.

NOTICE Possible EMI sources should be identified before the unit is installed.

Electrical and electronic equipment may produce EMI unintentionally as the result of a defect. Sources of EMI include the following:

- medical lasers
- scanners
- cauterizing guns
- computers
- monitors
- fans
- gel warmers
- microwave oven
- light dimmers
- portable phones
- broadcast stations and mobile broadcasting machines

Table 2-4 EMI Prevention/Abatement

EMI Rule	Details
Be aware of RF sources.	Keep the unit at least 5 meters (16.4 feet) away from other EMI sources. Special shielding may be required to eliminate interference problems caused by high frequency, high powered radio or video broadcast signals.
Ground the unit.	Poor grounding is the most likely reason a unit will have noisy images. Check grounding of the power cord and power outlet.
Replace and/or reassemble all screws, RF gaskets, covers and cores.	After you finish repairing or updating the system, replace all covers and tighten all screws. Any cable with an external connection requires a magnet wrap at each end. Install the shield over the front of card cage. Loose or missing covers or RF gaskets allow radio frequencies to interfere with the ultrasound signals.
Replace broken RF gaskets.	If more than 20% or a pair of the fingers on an RF gasket are broken, replace the gasket. Do not turn ON the unit until any loose metallic part is removed and replaced, if required.
Do not place labels where RF gaskets touch metal.	Never place a label where RF gaskets meet the unit. Otherwise, the gap created will permit RF leakage. In case a label has been found in such a location, move the label to a different, appropriate location.
Use GE- specified harnesses and peripherals.	The interconnect cables are grounded and require ferrite beads and other shielding. Cable length, material, and routing are all important; do not make any changes that do not meet all specifications.
Take care with cellular phones.	Cellular phones may transmit a 5 V/m signal that causes image artifacts.
Properly dress peripheral cables.	Do not allow cables to lie across the top of the card cage or hang out of the peripheral bays. Loop the excess length for peripheral cables inside the peripheral bays. Attach the monitor cables to the frame.

2-2-4 Probe Environmental Requirements

Operation: Ambient temperature 18° to 30° C

Storage: -10° to 50° C

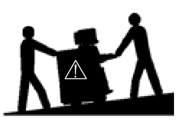
NOTE: Temperature in degrees C. Conversion to degrees F = °C (9/5) + 32).

NOTICE SYSTEMS AND ELECTRONIC PROBES ARE DESIGNED FOR STORAGE TEMPERATURES OF -10 TO + 50 degrees C. WHEN EXPOSED TO LARGE TEMPERATURE VARIATIONS, THE PRODUCT SHOULD BE KEPT IN ROOM TEMPERATURE FOR 10 HOURS BEFORE USE.

2-2-5 Time and Manpower Requirements

Site preparation takes time. Begin Pre-installation checks as soon as possible. If possible, allow six weeks before delivery, for enough time to make necessary changes.

CAUTION Have two people available to deliver and unpack the Voluson® S8 / Voluson® S6 ultrasound system.
Attempts to move the unit considerable distances (or on an incline) by one person alone, could result in personal injury and/or damage to the system.



2-2-6 System Specifications

2-2-6-1 Physical Dimensions of Voluson® S8 / Voluson® S6

The physical dimensions and weight (without Peripherals) of the Voluson® S8 / Voluson® S6 unit are summarized in Table 2-5.

NOTE: Physical dimensions (especially height and depth) depend on control console and monitor positioning. For more details refer to Chapter 5 - OPIO Positioning, on page 5-45.

Table 2-5 Physical Dimensions and Weight (without Monitor and Peripherals)

Height	Width	Depth	Weight
1730 mm / 70.0 inch * 980 mm / 39.0 inch **	620 mm / 25.5 inch	850 mm / 34.0 inch *	90 kg / 200.0 lbs.

* maximum at “normal” Monitor position (control console is elevated and moved forwards to the maximum)
** minimum at “normal” Monitor position (no control console elevation or forwards movement)

2-2-6-2 Acoustic Noise Output

max. 55 dB(A)

2-2-6-3 Electrical Specifications

Please refer to Section 2-2-2-1 "Voluson® S8 / Voluson® S6 Power Requirements" on page 2-3.

Section 2-3
Facility Needs

2-3-1 Purchaser Responsibilities

The work and materials needed to prepare the site is the responsibility of the purchaser. Delay, confusion, and waste of manpower can be avoided by completing pre installation work before delivery.

Use the Pre-installation checklist (provided in Table 2-6) to verify that all needed steps have been taken.

Table 2-6 Voluson® S8 / Voluson® S6 Pre-Installation Check List

Action	Yes	No
Schedule at least 3 hours for installation of the system.		
Notify installation team of the existence of any variances from the basic installation.		
Make sure system and probes have been subject to acclimation period.		
Environmental cooling is sufficient.		
Lighting is adjustable to adapt to varying operational conditions of the scanner.		
Electrical facilities meet system requirements.		
EMI precautions have been taken and all possible sources of interference have been removed.		
Mandatory site requirements have been met.		
If a network is used, IP address has been set for the system and a dedicated network outlet is available.		

Purchaser responsibility includes:

- Procuring the materials required.
- Completing the preparations before delivery of the ultrasound system.
- Paying the costs for any alterations and modifications not specifically provided in the sales contract.

NOTE: *All electrical installations that are preliminary to the positioning of the equipment at the site prepared for the equipment must be performed by licensed electrical contractors. Other connections between pieces of electrical equipment, calibrations, and testing must also be performed by qualified personnel. The products involved (and the accompanying electrical installations) are highly sophisticated and special engineering competence is required. All electrical work on these products must comply with the requirements of applicable electrical codes. The purchaser of GE equipment must only utilize qualified personnel to perform electrical servicing on the equipment.*

The desire to use a non–listed or customer provided product or to place an approved product further from the system than the interface kit allows presents challenges to the installation team. To avoid delays during installation, such variances should be made known to the individuals or group performing the installation at the earliest possible date (preferably prior to the purchase).

The ultrasound suite must be clean prior to delivery of the machine. Carpet is not recommended because it collects dust and creates static. Potential sources of EMI (electromagnetic interference) should also be investigated before delivery. Dirt, static, and EMI can negatively impact system reliability.

2-3-2 Mandatory Site Requirements

The following are mandatory site requirements. Additional (optional) recommendations, as well as a recommended ultrasound room layout, are provided in Section 2-3-3 "Site Recommendations" .

- A dedicated single branch power outlet of adequate amperage (see Table 2-3 on page 2-3) that meets all local and national codes and is located less than 2.5 m (8.2 ft) from the unit's proposed location. Refer to: Section 2-2-2 "Electrical Requirements" on page 2-2.
- A door opening of at least 76 cm (2.5 ft) in width.
- The proposed location for the unit is at least 0.2 m (0.67 ft) from the walls, to enable cooling.
- Clean and protected space for storage of probes (either in their case or on a rack).
- Material to safely clean probes (performed using a plastic container, never metal).
- Power outlet and place for any external peripheral are within 2 m (6.5 ft.) of each other with peripheral within 1 m of the unit to connect cables.

NOTE: The Voluson® S8 / Voluson® S6 has four outlets inside the unit. One is for the monitor and three for on board peripherals.

In case of network option:

- An active network outlet in the vicinity of the ultrasound unit.
- A network cable of appropriate length (regular Pin-to-Pin network cable).
- An IT administrator who will assist in configuring the unit to work with your local network. A fixed IP address is required. Refer to the form provided in Figure 3-51 on page 3-63 for network details that are required.

NOTE: All relevant preliminary network port installations at the prepared site must be performed by authorized contractors. The purchaser of GE equipment must utilize only qualified personnel to perform servicing of the equipment.

2-3-3 Site Recommendations

The following are (optional) site recommendations. Mandatory site requirements are provided in the *Mandatory Site Requirements* section, above.

- Door opening of 90 cm (3 ft) in width.
- Accessible circuit breaker for a dedicated power outlet.
- Sink with hot and cold running water.
- Receptacle for bio–hazardous waste, for example, used probe sheaths.
- Emergency oxygen supply.
- Storage area for linens and equipment.
- Nearby waiting room, lavatory, and dressing room.
- Dual level lighting (bright and dim).
- Lockable cabinet for software and manuals.

2-3-3-1 Recommended Ultrasound Room Layout

Figure 2-1 below shows a floor plan illustrating the recommended layout of the Ultrasound Room and depicting the minimal room layout requirements.

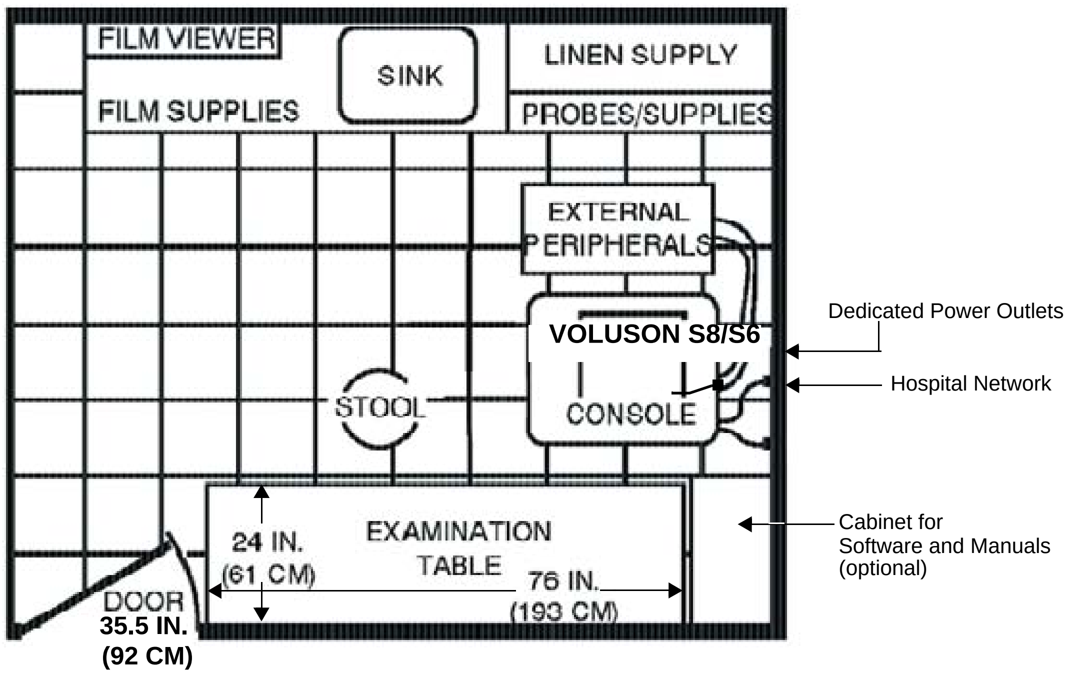


Figure 2-1 Recommended Floor Plan 4.3m x 5.2m (14ft x 17ft)

2-3-4 Networking Setup Requirements

2-3-4-1 Stand-alone Unit (without Network Connection)

None

2-3-4-2 Unit Connected to Hospital's Network

Supported networks:

- Ethernet
- Wireless LAN

2-3-4-3 Purpose of the DICOM Network Function

DICOM (**D**igital **I**maging and **Co**mmunications in **M**edicine) services provide the operator with clinically useful features for moving images and patient information over a hospital network.
Examples of DICOM services include the transfer of images to workstations for viewing or transferring images to remote printers. As an added benefit, transferring images in this manner frees up the on-board monitor and peripherals, enabling viewing to be done while scanning continues.
With DICOM, images can be archived, stored, and retrieved faster, easier, and at a lower cost.

2-3-4-4 DICOM Option Pre-installation Requirements

To configure the Voluson® S8 / Voluson® S6 ultrasound unit to work with other network connections, the network administrator must provide some necessary information.

Use the Connectivity Setup Worksheet on page 3-62 to record required information that must include:

• **Voluson® S8 / Voluson® S6 Details:**	DICOM network details for the Voluson® unit, including the host name, local port, IP address, AE title and net mask.
• **Routing Information:**	IP addresses for default gateway and other routers in use at site.
• **DICOM Application Information:**	Details of DICOM devices in use at the site, including the DICOM host name, AE title, DICOM port number and IP addresses.

Installation see: Section 3-12 "Network IP Address Configuration" on page 3-59.

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Chapter 3
Setup Instructions

Section 3-1
Overview

3-1-1 The Purpose of Chapter 3

This chapter contains information needed to setup the Voluson® S8 / Voluson® S6 ultrasound system. Included are procedures to receive, unpack and configure the equipment.
A worksheet is provided (see: page 3-62 to page 3-63) to help ensure that all the required information is available, prior to setup the system.

Table 3-1 Contents in Chapter 3

Section 3-2
Set Up Reminders

3-2-1 Average Installation Time

Once the site has been prepared, the average installation time required is shown in Table 3-2 below.

Table 3-2 Average Installation Time

Description	Average Installation Time	Comments
Unpacking the scanner	0.5 hours	
Installing the scanner / options / printers	0.5 to 1.5 hours	depends on required configuration
DICOM Option (connectivity)	0.5 - 1.5 hours	depends on configuration amount

3-2-2 Installation Warnings

1.) Since the Voluson® S8 / Voluson® S6 weighs approximately 87.5 kg (192.5 lbs.) without peripherals, two people are required to unpack it.
2.) There are no operator serviceable components. To prevent shock, do not remove any covers or panels. Should problems or malfunctions occur, unplug the power cord.
Only qualified service personnel should carry out servicing and troubleshooting.

3-2-2-1 Moving/Lifting the System

When moving or lifting the system, **grasp it only** at the rear handle and the “handles” underneath the footrest cover.
(see: Figure 3-1 on page 3-2).

WARNING Do **NOT** pull or lift the system with the front handle of the user interface (operator panel).

Figure 3-1 moving or lifting the system

3-2-2-2 System Acclimation Time

After being transported, the Voluson® S8 / Voluson® S6 system may be very cold or hot.
It requires one hour for each 2.5°C increment if it's temperature is below 10°C or above 40°C.

CAUTION **Equipment damage possibility. Turning the system on without acclimation after arriving at site may cause the system to be damaged.**

Table 3-3 Acclimation Time

°C	60	55	50	45	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40
°F	140	131	122	113	104	96	86	77	68	59	50	41	32	23	14	5	-4	-13	-22	-31	-40
hrs	10	8	6	4	2	0	0	0	0	0	0	2	4	6	8	10	12	14	16	18	20

3-2-2-3 OPIO Position

If weight is placed on the OPIO (User Interface) in it’s extended position the console could tip over.

WARNING ***The system should NOT be moved with the OPIO (User Interface) extended. Move the OPIO to it’s centered and locked position. Refer to 4-7-1 on page 4-53.***

WARNING ***Monitor mounting mechanism may break if not properly supported (e.g., with packing foam) during transportation.***

3-2-2-4 Brake Pedal Operation

WARNING ***REMEMBER: If the front wheel brakes are engaged for transportation, release brake pedals (brakes on front wheels under the foot rest) to disengage the lock.***

3-2-3 Safety Reminders

DANGER **WHEN USING ANY TEST INSTRUMENT THAT IS CAPABLE OF OPENING THE AC GROUND LINE (I.E., METER'S GROUND SWITCH IS OPEN), DO NOT TOUCH THE UNIT!**

CAUTION **Two people should unpack the unit because of its weight.**
Two people are required whenever a part weighing 16kg (35 lb.) or more must be lifted.

CAUTION **If the unit is very cold or hot, do NOT turn on its power until it has had sufficient time to acclimate to its operating environment.**

CAUTION **To prevent electrical shock, connect the unit to a properly grounded power outlet.**
DO NOT use a three to two prong adapter. This defeats safety grounding.

CAUTION **DO NOT wear the ESD wrist strap when you work on live circuits and more than 30 V peak is present.**

CAUTION **DO NOT use a 20 Amp to 15 Amp adapter on the 120 Vac unit's power cord.**
This unit requires a dedicated 16 A circuit.

CAUTION **DO NOT operate this unit unless all board covers and frame panels are securely in place, to ensure optimal system performance and cooling.**
(When covers are removed, EMI may be present).

CAUTION **OPERATOR MANUAL(S)**
The User Manual(s) should be fully read and understood before operating the Voluson® S8 / Voluson® S6. Keep manuals near the unit for reference.

CAUTION **ACOUSTIC OUTPUT HAZARD**
Although the ultrasound energy transmitted from the Voluson® S8 / Voluson® S6 ultrasound system is within FDA limitations, avoid unnecessary exposure.
Ultrasound energy can produce heat and mechanical damage.

Figure 3-2   Environmental Labels

Section 3-3
Receiving and Unpacking the Equipment

CAUTION **Please read this section carefully before unpacking the Voluson® S8 / Voluson® S6 ultrasound system and its (optional) peripherals.**

The Voluson® S8 / Voluson® S6 ultrasound systemand accessories are shipped from the factory in a single durable shipping carton which is mounted on a raised wooden platform base.

CAUTION **Transport only with forklift or stacker truck.**
During transport pay attention to the point of gravity (“tilt and drop” indicator)!

Have two people available to unpack the Voluson® S8 / Voluson® S6.
Attempts to move the unit considerable distances (or on an incline) by one person alone, could result in personal injury, and/or damage to the system.

Table 3-4 Shipping Carton - Dimensions and Weight

Description	Height	Width	Depth	Weight*
Voluson® S8 / Voluson® S6 incl. accessories	1470 mm / 57.9 inch	750 mm / 29.5 inch	1060 mm / 46.5 inch	120 kg / 264.5 lbs

* Weight is approximate and will vary depending upon the supplied peripherals

Before unpacking the unit:

- Inspect the carton package for visible damage.
- Inspect the Shock and Tilt Indicator for evidence of accidental shock or tilting during transit, see: Figure 3-3 below).

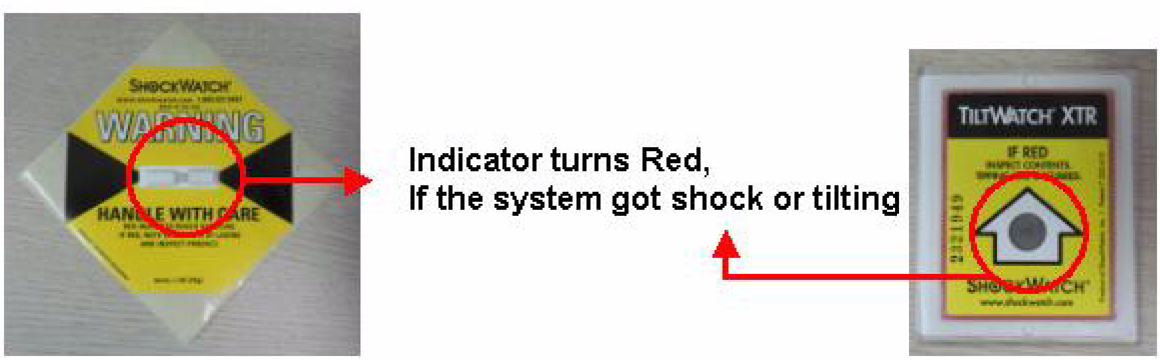


Figure 3-3 Shock and Tilt Indicator

NOTICE **The device must only be transported in the original packaging!**

Each shipping crate is sealed with cross-head screws. A Phillips 2 screwdriver is needed to open the crate. It is recommended to keep and store the shipping crate and all other packing materials (including the support foams, anti-static plastic cover, etc.), in case the unit has to be moved to a different location. Unpack the devices such a way that packaging can be reused.

For warranty purposes, storage of the above is required for one year from date of purchase..

NOTICE **The device must only be transported in the original packaging!**

If the shipping crate is damaged, please inform the GE Healthcare sales representative immediately.

Section 3-3 Receiving and Unpacking the Equipment (cont'd)

The envelope with delivery address, packing list and invoice is located on the front panel of the crate.

Check whether delivery is complete
(according to packing list) and check visual damage!

Figure 3-4 envelope at front panel of the crate

Table 3-5 Unpacking Procedure

Step	Task
1.	Loosen the screws. **DO NOT** remove the top panel, just place it on the crate (about middle of side walls). 

Table 3-5 Unpacking Procedure

Step	Task
2.	Remove the top cover and top plate.  
3.	Remove the three Plastic Joints from the outer sleeve.. 
4.	Remove the outer sleeve and the monitor cushion  

Table 3-5 Unpacking Procedure

Step	Task
5.	Cut the tape to unfold the package and remove the antistatic vinyl cover  
6.	Disengage the brakes, grasp the system at the handle, then slowly move unit down the ramp. 
Note: Packing crate and material should be stored for future use.	

Section 3-4
Preparing for Set Up

3-4-1 Verify Customer Order

1.) After unpacking the equipment, it is important to verify that all items ordered by the customer have been received. Compare all items listed on the packing slip (delivery note) with those received.

NOTICE It is recommended to keep and store the shipping carton and all other packing materials (including the support foams, anti-static plastic cover, etc.), in case the unit has to be moved to a different location.
Unpack the devices such a way that packaging can be reused.
For warranty purposes, storage of the above is required for one year from date of purchase.

2.) Visually inspect the system components using the following checklist.

Table 3-6 Damage Inspection Checklist - Voluson® S8 / Voluson® S6 System

✓	Step	Item	Recommended Procedure
	1	Main label	Enter **Serial Number:** ________________________ (printed on main label, see: Figure 1-2 on page 1-11)
	2	Console	Verify that the system is switched OFF and unplugged. Clean the console and control panel.
	3	Control Console	Physically inspect the control console for missing or damaged items. After switching on the system, verify the proper illumination of all the control panel buttons.
	4	Probes	Check all probes for wear and tear on the lens, cable, and connector. Look for bent or damaged pins on the connector and in the connector socket on the unit. Verify that the EMI fingers around the probe connector socket housing are intact. Check the probe locking mechanism and probe switch.
	5	LCD Display	Clean the LCD display by gently wiping with a dry, soft, lint-free non-abrasive folded cloth. Inspect the monitor for scratches and raster burn.
	6	Fans	Verify that the system's cooling fans and peripheral fans are operating.
	7	Rear Panel	Check the rear panel connectors for bent pins, loose connections and loose or missing hardware. Screw all the cable connectors tightly to the connector sockets on the panel. Verify that the labeling is in good condition.
	8	Covers	Check that all screws are tightly secured in place, that there are no dents or scratches and that no internal parts are exposed.
	9	Peripherals	Check and clean the peripherals in accordance with the manufacturer's directions. To prevent EMI or system overheating, dress the peripheral cables inside the peripheral cover.
	10	Power Cord	Check the power cord for cuts, loose hardware, tire marks, exposed insulation, or any deterioration. Verify continuity. Replace the power cord, as required.

NOTE: Report any items that are missing, back-ordered, or damaged, to your GE Healthcare sales representative. The contact address is shown in Contact Information on page 1-15.

WARNING ***CONNECTING A Voluson® S8 / Voluson® S6 SCANNER TO THE WRONG VOLTAGE LEVEL WILL MOST LIKELY DESTROY THE SCANNER.***

3-4-2 EMI Protection

This unit has been designed to minimize the effects of Electo-Magnetic Interference (EMI). Many of the covers, shields, and screws are provided primarily to protect the system from image artifacts caused by this interference. For this reason, it is imperative that all covers and hardware are installed and secured before the unit is put into operation.

Ensure that the system is protected from electromagnetic interference (EMI), as follows:

- Operate the system at least 15 feet away from equipment that emits strong electromagnetic radiation.
- Operate the system in an area enclosed by walls, floors and ceilings comprised of wood, plaster or concrete, which help prevent EMI.
- Shield the system when operating it in the vicinity of radio broadcast equipment, if necessary.
- Do not operate mobile phones or other EMI emitting devices in the ultrasound room.
- Verify that all EMI rules listed in the following table are followed:

The Voluson® S8 / Voluson® S6 ultrasound unit is approved for use in hospitals, clinics and other environmentally qualified facilities, in terms of the prevention of radio wave interference. Operation of the ultrasound unit in an inappropriate environment can cause electronic interference to radios and television sets situated near the medical equipment.
For further details and EMI Prevention/Abatement refer to Section 2-2-3 "EMI Limitations" on page 2-4.

Section 3-5
Connection of Auxiliary Devices

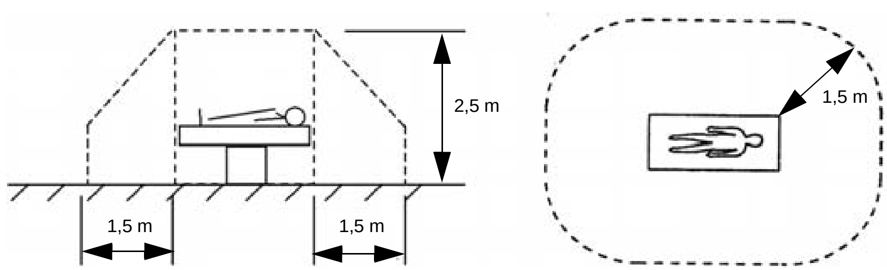
NOTE: ***Normally auxiliary devices and peripherals come pre-installed with the system.***

Table 3-7 below outlines hardware installation procedures described in the sub-sections.

Table 3-7 Connection Procedures

WARNING ***After each installation, the leakage currents have to be measured according to IEC 60601-1 respectively UL 60601-1.***

CAUTION **Please observe that some printers may not be medical devices! If the Bluetooth Printer and/or Line Printers are not medical devices, they have to be located outside of the patient environment (according to IEC 60601-1 / UL 60601-1).**



NOTE: *For more detailed Safety Considerations when connecting auxiliary devices to the Voluson® S8 / Voluson® S6 system, please review: Chapter 1 - Auxiliary Devices Safety, on page 1-8.*

3-5-1 Connecting the LCD Monitor

NOTE: The LCD monitor comes pre-installed with the system.

Figure 3-5 Connection Scheme - LCD Monitor

3-5-2 Connecting the Black & White Printer

1.) Power OFF/Shutdown the system as described in: Section 3-6-3 on page 3-28.
2.) Connect the Black & White printer according to correct connection scheme as described **in** Figure 3-6 on page 3-14

NOTE: The Black & White printer should be connected to the ***USB2*** *port of the Voluson® S8 / Voluson® S6´s PC-part.*

3.) When all the cables are connected, press the Power ON switch on the Black & White printer.
4.) Power ON/Boot up the Voluson® S8 / Voluson® S6 system as described in Section 3-6-2 on page 3-24. All software drivers are pre-installed for the designated Black & White printer only.
5.) After physical connection to the Voluson® S8 / Voluson® S6 system, assign the printer to a remote key (**P1**, **P2**, **P3** and/or **P4**) as described in Section 3-7-6 "Remote Control Selection" on page 3-43.
6.) Verify the correct settings in the printer “Properties”, see: Section 3-7-5 "Adjustment of Printer Settings" on page 3-36.

WARNING ***After each installation, the leakage currents have to be measured according to IEC 60601-1 respectively UL 60601-1.***

3-5-2-1 Connection Scheme: B&W Printer

Figure 3-6 B&W Printer connection

3-5-3 Connecting the Color Printer

1.) Power OFF/Shutdown the system as described in: Section 3-6-3 on page 3-28.

2.) Connect the Color printer according to correct connection scheme as described in Figure 3-7 on page 3-16.

NOTE: The Color printer should be connected to the ***USB1*** *port of the Voluson® S8 / Voluson® S6´s PC-part.*

3.) When all the cables are connected, press the Power ON switch on the Color printer.

4.) Power ON/Boot up the Voluson® S8 / Voluson® S6 system as described in Section 3-6-2 on page 3-24. All software drivers are pre-installed for the designated Color printer only.

5.) After physical connection to the Voluson® S8 / Voluson® S6 system, assign the printer to a remote key (**P1**, **P2**, **P3** and/or **P4**) as described in Section 3-7-6 "Remote Control Selection" on page 3-43.

6.) Verify the correct settings in the printer “Properties”, see: Section 3-7-5 "Adjustment of Printer Settings" on page 3-36.

WARNING ***After each installation, the leakage currents have to be measured according to IEC 60601-1 respectively UL 60601-1.***

3-5-3-1 Connection Scheme: Color Printer

Figure 3-7 Color Printer connection

3-5-4 Connecting the DeskJet Color Printer

3-5-4-1 Connection via Bluetooth Adapter

The DeskJet Color Printer can be connected to an external, non-isolated power source. The bluetooth adapter should be directly connected to the indicated USB 3 on rear panel

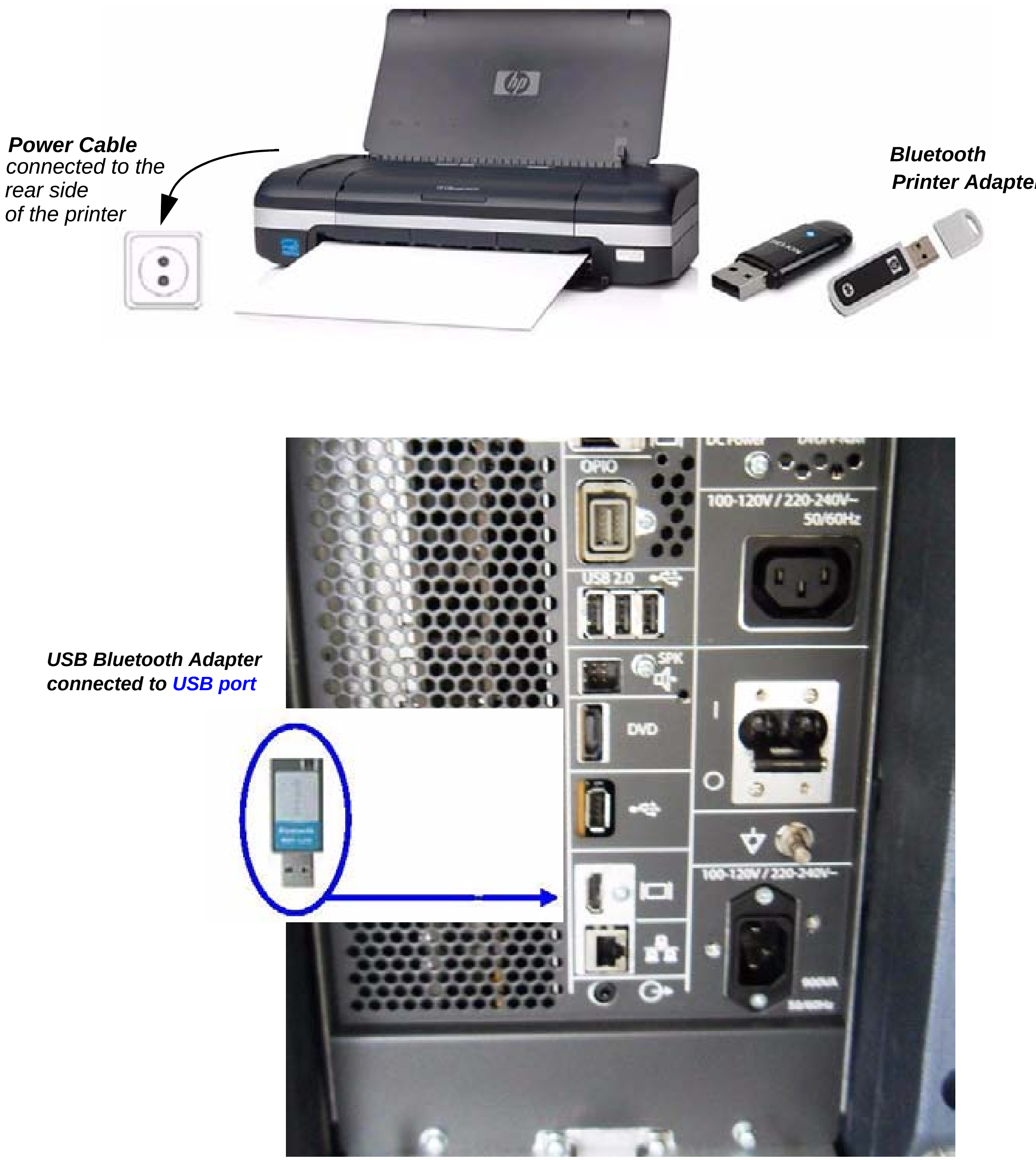


Figure 3-8 HP Officejet H470 DeskJet Printer connection (via Bluetooth Adapter)

3-5-4-1 Connection via Bluetooth Adapter (cont'd)

CAUTION **Please observe that the complete Bluetooth Printer Assembly has to be located outside of the patient environment (according to IEC 60601-1 / UL 60601-1).**

CAUTION **The printer being used may not be a medical device. The Bluetooth Printer Set and the Power Supply of the Bluetooth Printer Adapter is also not a medical device.**
The equipment meets the requirements of the EN 60950 Standard.

NOTICE Please use the proper Bluetooth Printer Connection set.
see: Chapter 9 - Printers and options, on page 9-15.

3-5-5 Connecting the Wireless Network Adapter

The Wireless Network Adapter can be connected to any accessible USB port of the Voluson® S8 / Voluson® S6.

NOTE: Connection of the WLAN Adapter is always the same.

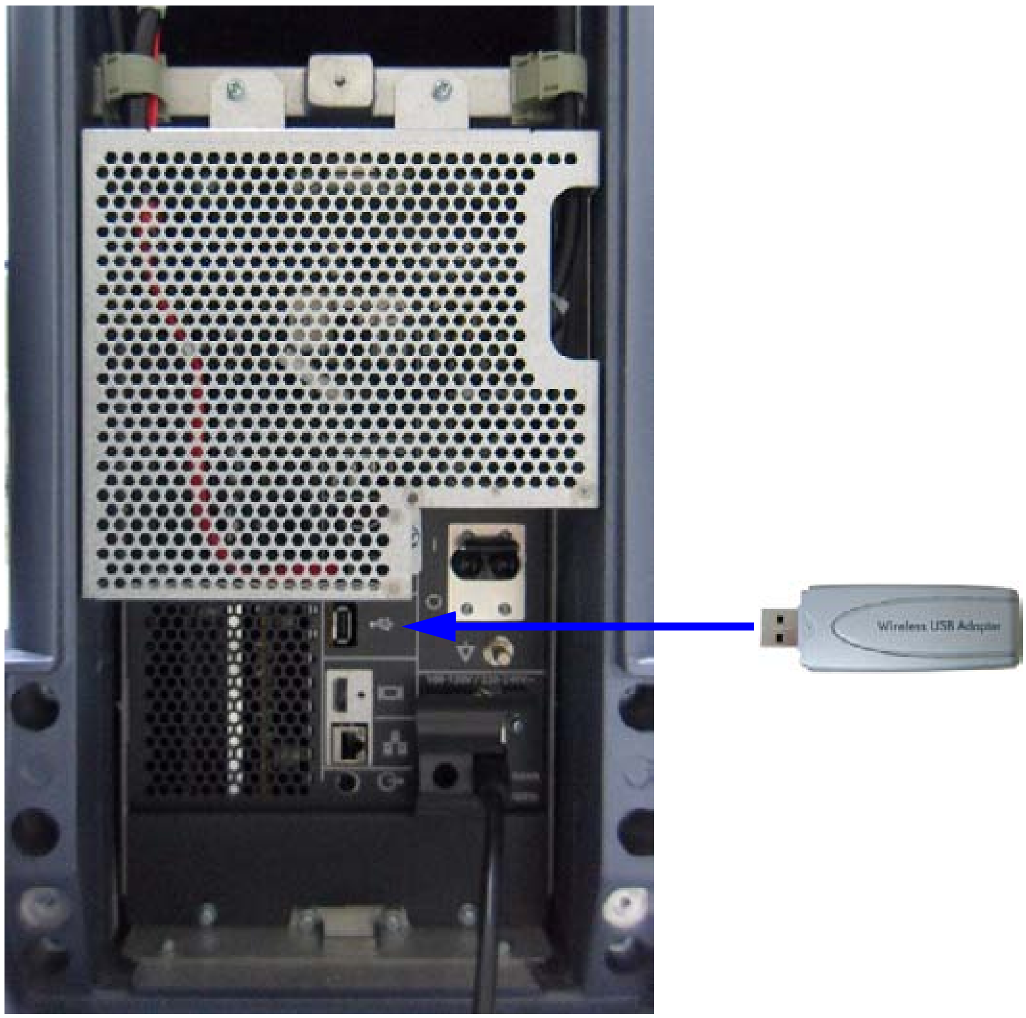


Figure 3-9 Connection Scheme - Wireless (USB) Network Adapter

1.) Turn ON the power of the system and wait till the system has booted.
2.) Plug the Wireless Network adapter into an accessible USB port of the Voluson® S8 / Voluson® S6. All software drivers are pre-installed for the designated Wireless Network adapter only.

NOTE: After physical connection of the WLAN adapter to the Voluson® S8 / Voluson® S6 system, follow the procedure described in Section 3-11-2 "Wireless Network Configuration" on page 3-56.

3-5-6 Connecting the Footswitch

The footswitch should be directly connected to any accessible USB-port on the Voluson® S8 / Voluson® S6 (e.g., on rear of the system).

NOTE: Connection of the Footswitch is always the same.

After physical connection, adjust the Footswitch (Left/Right) as described in Section 3-8-1-6 "How to adjust function of the Footswitch (Left/Middle/Right)" on page 3-47.

Figure 3-10 Connection Scheme - Footswitch

3-5-7 Connecting the USB Flash Memory Stick

NOTICE Before connecting an USB device, please read General Remarks and Hints when using external USB-Devices on page 3-22.

The USB Flash Memory Stick may be connected to an accessible USB port of the Voluson® S8 / Voluson® S6 system (e.g., on back of control console).

An external USB Flash Memory Stick can be connected once the system is powered ON, or after shutdown. The Voluson® S8 / Voluson® S6, Windows detects the device and automatically installs a driver. During this process several dialogs may pop up, starting with the „Found New Hardware” dialog.

*NOTE: Memory drives or sticks may be sensitive to EMC interference.
This may affect system performance and/or image quality.*

NOTICE Before disconnecting an external USB-device (e.g., USB Stick), the system has to be informed about the removal of the device! For this purpose press the **F3** button on the keyboard.
For further details refer to: Section 3-5-9-2 "External USB-Devices - Disconnection" on page 3-22.

3-5-8 Connecting the external USB Hard disk (Handydrive)

NOTICE Before connecting an USB device, please read General Remarks and Hints when using external USB-Devices on page 3-22.

The external “Handydrive” HDD may be connected to an accessible USB port of the Voluson® S8 / Voluson® S6 system (e.g., on back of control console).

An external USB Hard Disk Drive can be connected once the system is powered ON, or after shutdown. The Voluson® S8 / Voluson® S6, Windows detects the device and automatically installs a driver. During this process several dialogs may pop up, starting with the „Found New Hardware“ dialog.

*NOTE: Memory drives or sticks may be sensitive to EMC interference.
This may affect system performance and/or image quality.*

NOTICE Before disconnecting an external USB-device (e.g., USB Hard disk), the system has to be informed about the removal of the device! For this purpose press the **F3** button on the keyboard.
For further details refer to: Section 3-5-9-2 "External USB-Devices - Disconnection" on page 3-22.

3-5-9 General Remarks and Hints when using external USB-Devices

WARNING ***Do not connect or disconnect any external USB-devices to or from the system while scanning a patient! The appearing dialogs could distract you from the scan!***

3-5-9-1 External USB-Devices - Connection

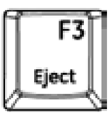
When an external USB-storage device (such as a USB-memory stick or an external hard disk) is connected to the Voluson® S8 / Voluson® S6, Windows detects the device and automatically installs a driver. During this process, several dialogs may pop up, starting with the “Found New Hardware“ dialog.

NOTE: If an external drive was not recognized automatically after connecting it, click RESCAN DRIVE.

The device is then accessible using the drive letter the system assigned to it.

NOTICE When connecting external USB devices, be sure to execute Safety Directions found in the Voluson® S8 / Voluson® S6 Basic User Manual.

3-5-9-2 External USB-Devices - Disconnection



Before an external USB-device (e.g., USB-memory stick) can be disconnected, the system has to be informed about the removal of the device!

CAUTION **Unplugging or ejecting USB devices without first stopping them can often cause the system to crash and possibly result in loss of valuable data.**

By pressing the **DRIVES** in the Sytem Setup, a dialog window (see: Figure 3-11 below) is displayed. The “Connect USB and Network Drives” window shows all USB and Network drives connected to the system. Using this dialog, the USB-devices can be stopped before they are physically disconnected.

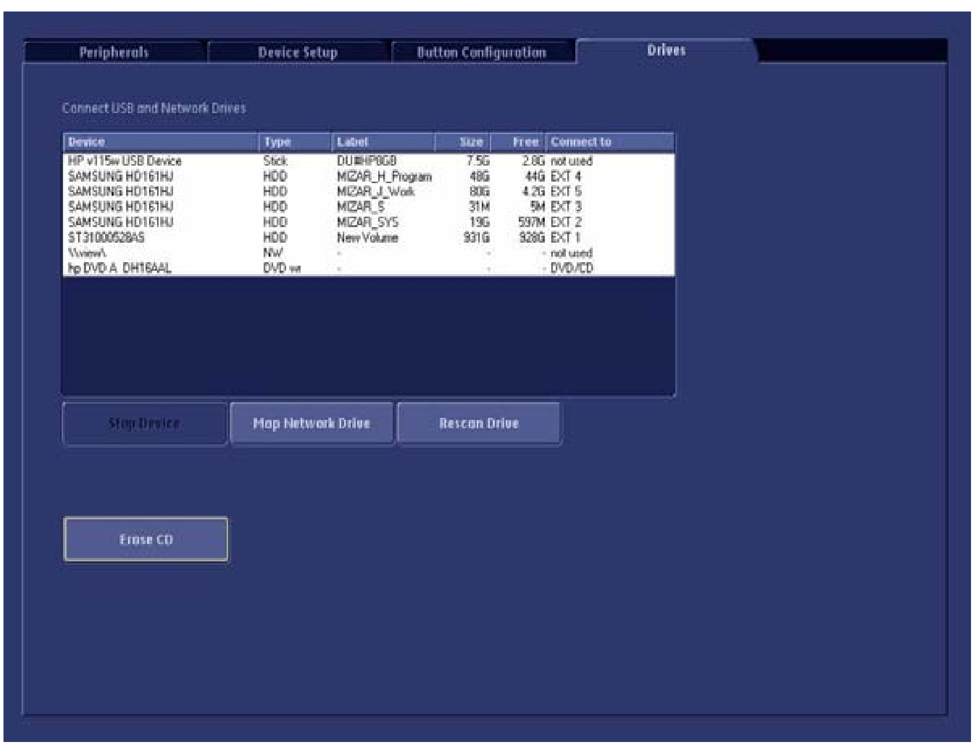


Figure 3-11 Connect USB and Network Drives

To stop the external device, select it and then click the STOP DEVICE button.

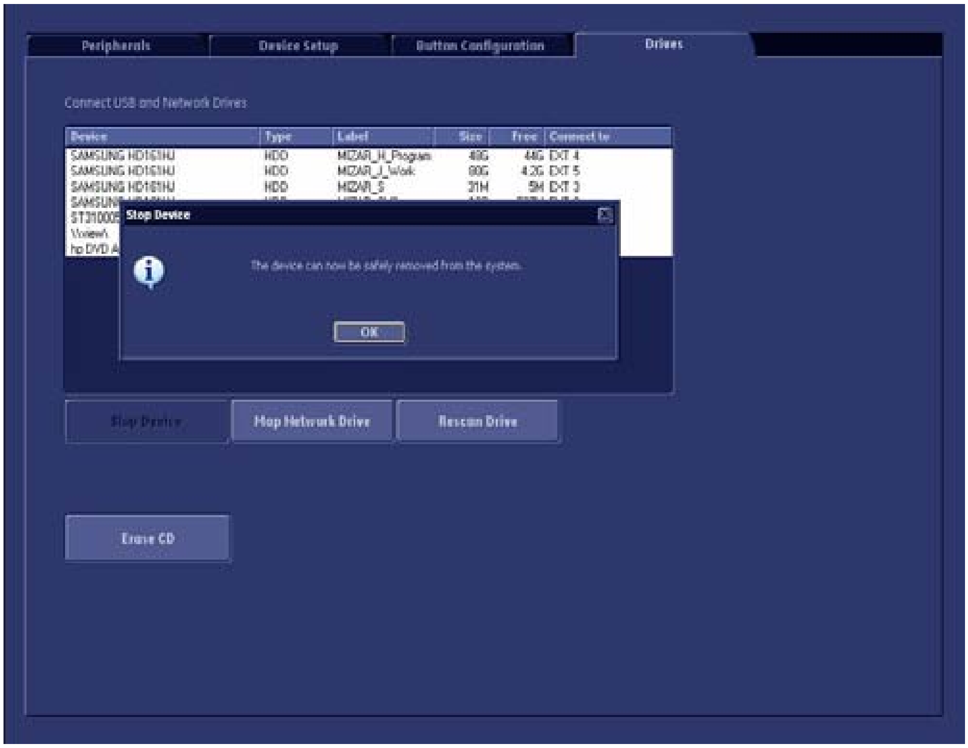


Figure 3-12 Device can now be safely removed

Confirm the ‘Stop Device‘ dialog with OK the “Connect USB and Network Drives” window.

Section 3-6
Completing the Set Up

3-6-1 Connecting the Unit to a Power Source

The connection of the Voluson® S8 / Voluson® S6 ultrasound unit to a power source should be performed by a qualified person who has completed basic Voluson® S8 / Voluson® S6 System User Training. Use only the power cords, cables and plugs provided by or designated by GE Healthcare to connect the unit to the power source.

CAUTION **Prior to connect the Voluson® unit to a power source, verify compliance with all electrical and safety requirements. Check the power cord to verify that it is intact and of hospital-grade. Products equipped with a power source (wall outlet) plug should be connected to the fixed power socket that has a protective grounding conductor. Never use an adapter or converter to connect with a power source plug (for example, a three-prong to two-prong converter).**

WARNING ***The unit's power must be supplied from a separate, properly rated outlet to avoid risk of fire. Refer to Section 2-2-2-1 "Voluson® S8 / Voluson® S6 Power Requirements" on page 2-3 for rating information. The power cord should not, under any circumstances, be altered to a configuration rated less than that specified for the current.***

CAUTION **Whenever disconnecting the Voluson® system from the electrical outlet, always observe the safety precautions. First unplug the main power cable from the wall outlet socket, then from the unit itself. Remove by pulling on the cable connector - DO NOT pull on the cable.**

CAUTION **The Voluson® S8 / Voluson® S6 requires all covers!
Operate this system only when all board covers and frame panels are securely in place.
The covers are required for safe operation, good system performance and cooling purposes.**

3-6-2 Power On / Boot Up

3-6-2-1 Scanner Power On

1.) Connect the Main Power Cable to the back of the system.
2.) Connect the Main Power Cable to a hospital grade power outlet with the proper rated voltage. Never use an adapter that would defeat the safety ground.

3.) Switch ON the Circuit at the rear of the system.

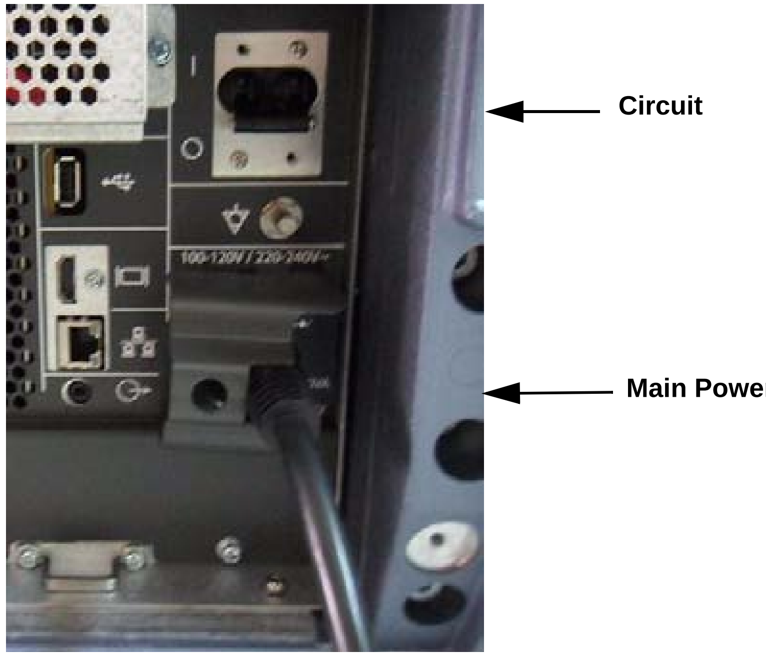


Figure 3-13 Circuit and main power cable at rear of system

3-6-2-2 Back End Processor Boot Up

NOTICE When AC power is applied to the scanner, the **ON/OFF** button on the control panel illuminates amber, indicating that the System (including the Back-end Processor) is in *Standby* mode.

4.) Hold down the **On/Off** button (see: Figure 3-14) on the control panel for ~3 seconds.

*NOTE: The mains outlet of the system for peripheral auxiliary equipment are commonly switched with the **ON/OFF** button. The power switch of any attached printer(s) needs to be in ON position before starting the system. However, be aware some auxiliary equipment may switch itself to standby mode (e.g., Color video printer) and must therefore be switched on separately.*

When the **ON/OFF** button on the control panel is pressed, the System (including the Back-end Processor) starts and the operating system is loaded which then leads the application software to activate the scanner.

The system automatically performs an initialization sequence which includes the following:

- Loading the operating system.
- Running a quick diagnostic check of the system.
- Detecting connected probes

Figure 3-14 On/Off Button on Control Panel

As soon as the software has been loaded, the system enters 2D-Mode with the probe and application that were used before the system was shut down.

NOTE: Total time used for start-up is about 2 minutes.

5.) Adjust Height and position of control console.
Refer to 4-7-1 "Control Console Positioning" on page 4-53.

3-6-2-3 During a normal boot, you may observe

A.) Power is distributed to Peripherals, Operator Panel (control panel), Monitor, Front-End and Back-End Processor.

B.) The Back-End Processor and rest of the scanner starts with the sequence listed in following steps:

1.) First of all, the BIOS version is shown on the monitor.

2.) Afterwards the “Boot Screen” is displayed. (**Voluson** is highlighted, Figure 3-15 below).

Figure 3-15 Boot screen

3.) Back-End Processor is turned ON and starts to load the software.

4.) The Start Screen (Voluson®) is displayed on the monitor.

5.) Start-up progress bars indicating software loading procedures, are displayed on the monitor, as shown in Figure 3-16 below.

Figure 3-16 GE Healthcare wallpaper with progress bar

6.) The software initiates and sets up the Front-End electronics and the rest of the scanner.

7.) The Keyboard backlight is lit.

8.) As soon as the software has been loaded, the 2D screen is displayed on the monitor.

3-6-3 Power Off / Shutdown

NOTICE After turning off a system, wait at least 10 seconds before turning it on again.
The system may not be able to boot if power is recycled too quickly.

3-6-3-1 Scanner Shutdown

1.) If not already in read mode, freeze the image.
2.) Press the **ON/OFF** button (see: Figure 3-14) on the control panel. Following dialog appears.

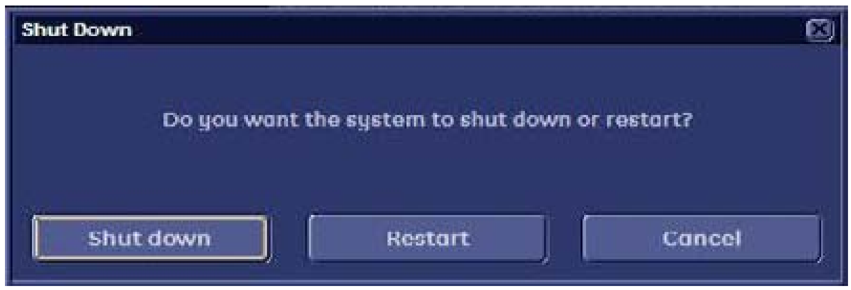


Figure 3-17 Shutdown, Restart or Cancel

3.) Select the SHUTDOWN button. The system performs an automatic full shutdown sequence.

NOTE: Full shut down is also performed when pressing the ON/OFF button on the control panel twice.

4.) Switch OFF the Circuit at the rear of the system.

*NOTE: The mains outlet of the system for peripheral auxiliary equipment are commonly switched with the **ON/OFF** button. So the auxiliary equipment need not to be switched ON/OFF separately.*

WARNING ***Disconnection of the Main Power Cable is necessary!***
For Example: When repairing the system.

5.) After complete power down, disconnect the main power cable from the system or unplug it from the AC wall outlet socket.

Figure 3-18 Circuit and main power at rear of system

6.) Press on the brakes to block the front caster wheels.

7.) Disconnect probes. (Turn the probe locking handle counterclockwise and then pull the connector straight out of the probe port.)

CAUTION **DO NOT disconnect a probe while running (Live Scan “Write” mode)!**
A software error may occur. In this case switch the unit OFF (perform a reset).

3-6-4 Transducer Connection

NOTE: *When the probe is connected, it is automatically activated.*
Once connected, the probes can be selected for different applications.

Connect a transducer to one of the three rightmost transducer receptacle as follows:

1.) Inspect the probe and probe socket to verify that it is free of debris.
2.) Ensure that the probe locking lever is at left position, as shown Figure 3-19.
3.) Insert the connector on the receptacle, and move lever to the right position to lock probe.

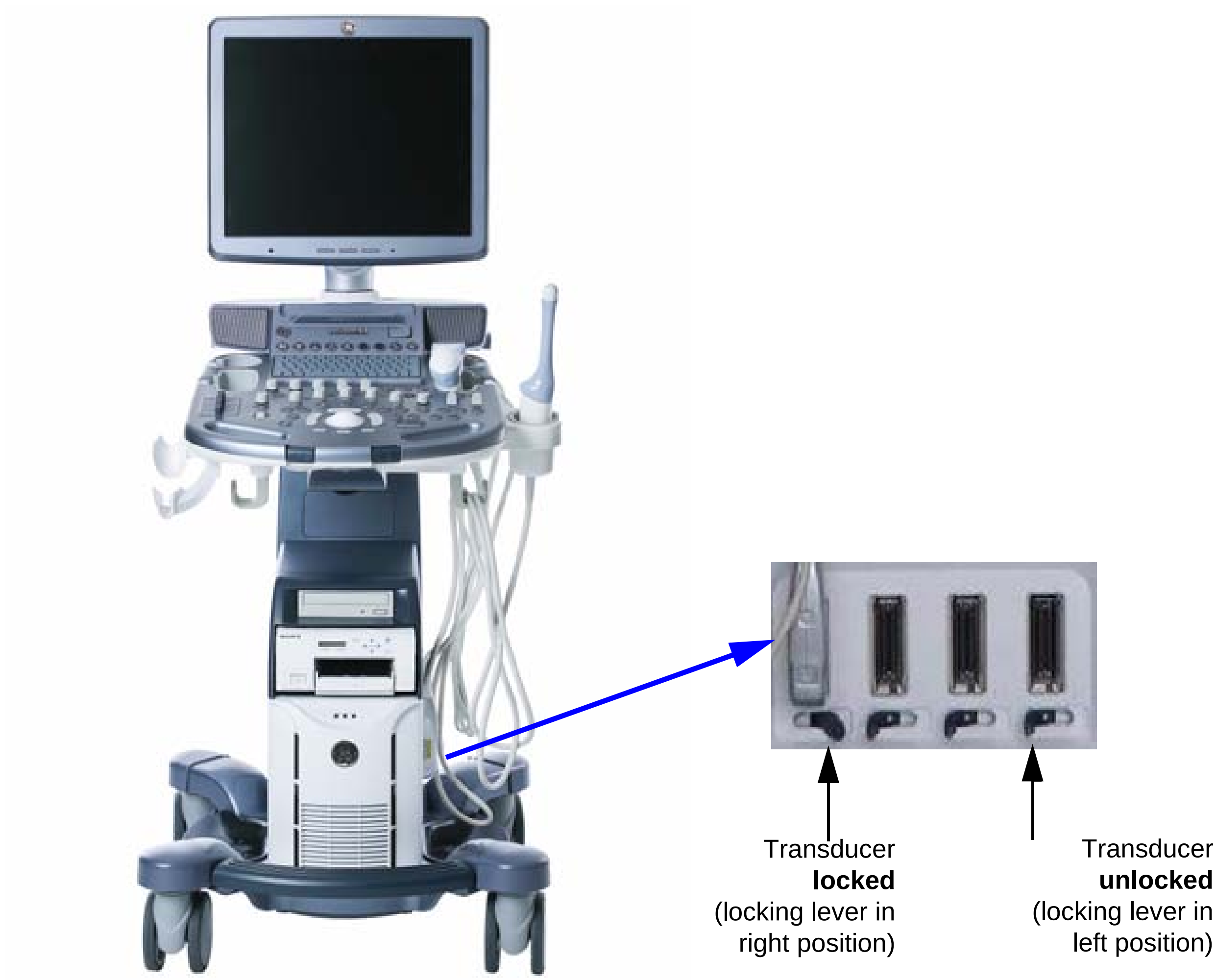


Figure 3-19 Transducer Connection

4.) Carefully position the probe cord so that it is free to move and is not resting on the floor.

CAUTION **Do not** bend the probe cable acutely. **Fault conditions can result in electric shock hazard.**
Do not touch the surface of probe connectors which are exposed when the probe is removed.
Do not touch the patient when connecting or disconnecting a probe.

NOTE: *Prior to connecting or disconnecting a probe, freeze the image.*
It is not necessary to turn OFF power to connect or disconnect a transducer.

Section 3-7
Printer Installation

NOTE: For Connection schemes refer to Section 3-5 "Connection of Auxiliary Devices" on page 3-11.

For further installation instructions see:

- Section 3-7-1 "Installing Digital Black & White Printer Sony UP-D897" on page 3-31
- Section 3-7-2 "Installing Digital Black & White Printer Mitsubishi P95D" on page 3-31
- Section 3-7-3 "Installing Digital Color Printer Sony UP-D25MD" on page 3-31
- Section 3-7-4 "Printer Installation manually" on page 3-32
- Section 3-7-5 "Adjustment of Printer Settings" on page 3-36

CAUTION **The Bluetooth Printer Connection set as well as the Color Deskjet printer MUST NOT be installed by the user!**
For installation please contact your local distributor or GE service representative.

3-7-1 Installing Digital Black & White Printer Sony UP-D897

1.) Power off/Shutdown the system as described in: Section 3-6-3 on page 3-28.
2.) Connect the printer as described on page 3-13.

NOTICE After boot up of the system, verify the correct settings in the printer “Properties”, see: Section 3-7-5 "Adjustment of Printer Settings" on page 3-36.
Afterwards assign the Printer to the remote keys **P1**, **P2**, **P3** and/or **P4**, see: Section 3-7-6 "Remote Control Selection" on page 3-43.

3-7-2 Installing Digital Black & White Printer Mitsubishi P95D

1.) Power off/Shutdown the system as described in: Section 3-6-3 on page 3-28.
2.) Connect the printer as described on page 3-13.

NOTICE After boot up of the system, verify the correct settings in the printer “Properties”, see: Section 3-7-5 "Adjustment of Printer Settings" on page 3-36.
Afterwards assign the Printer to the remote keys **P1**, **P2**, **P3** and/or **P4**, see: Section 3-7-6 "Remote Control Selection" on page 3-43.

3-7-3 Installing Digital Color Printer Sony UP-D25MD

1.) Power off/Shutdown the system as described in: Section 3-6-3 on page 3-28.
2.) Connect the printer as described on page 3-15.

NOTICE After boot up of the system, verify the correct settings in the printer “Properties”, see: Section 3-7-5 "Adjustment of Printer Settings" on page 3-36.
Afterwards assign the Printer to the remote keys **P1**, **P2**, **P3** and/or **P4**, see: Section 3-7-6 "Remote Control Selection" on page 3-43.

3-7-4 Printer Installation manually

1.) Press the **UTILITIES** key on the control panel.
2.) In the “Utilities” menu select SYSTEM SETUP to invoke the setup desktop on the screen.
3.) On the left side of the screen select CONNECTIVITY and then click on the **PERIPHERALS** tab.

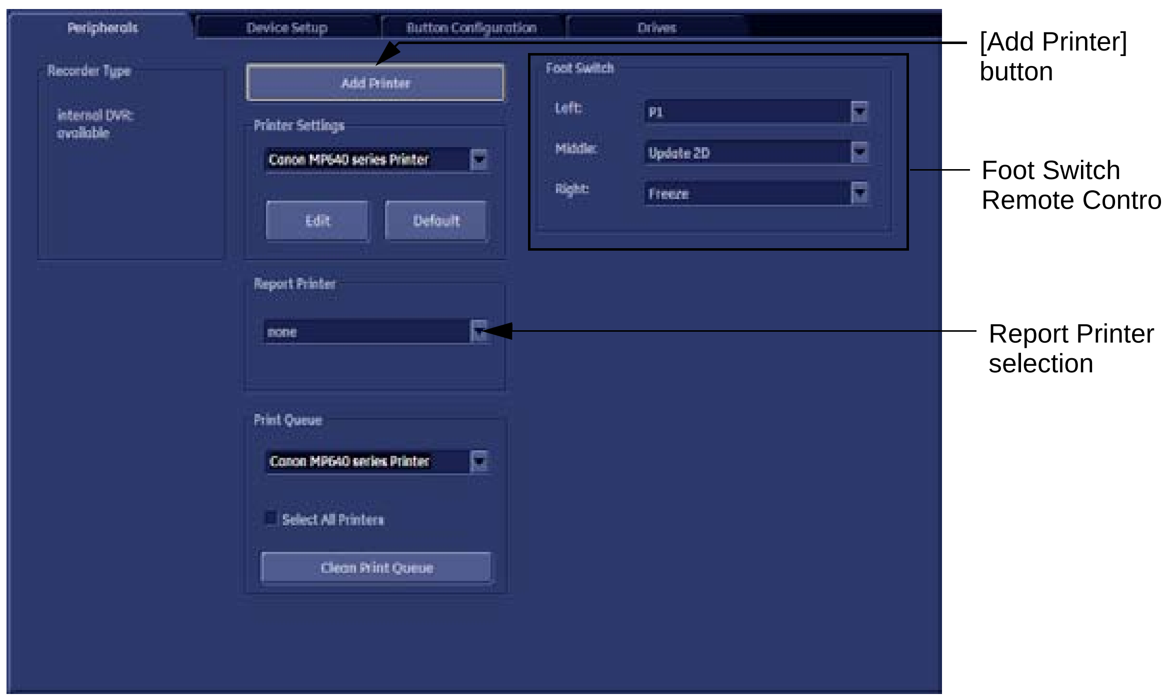


Figure 3-20 System Setup - Connectivity - PERIPHERALS page

4.) Click the ADD PRINTER button (see: Figure 3-20 above).
Please read the displayed message carefully and click YES if you have skills to do this.

5.) Click the NEXT button to start the Add Printer Wizard.
6.) Select the ‘Local Printer‘, deselect “Automatically install Plug and Play printer” and then click NEXT.

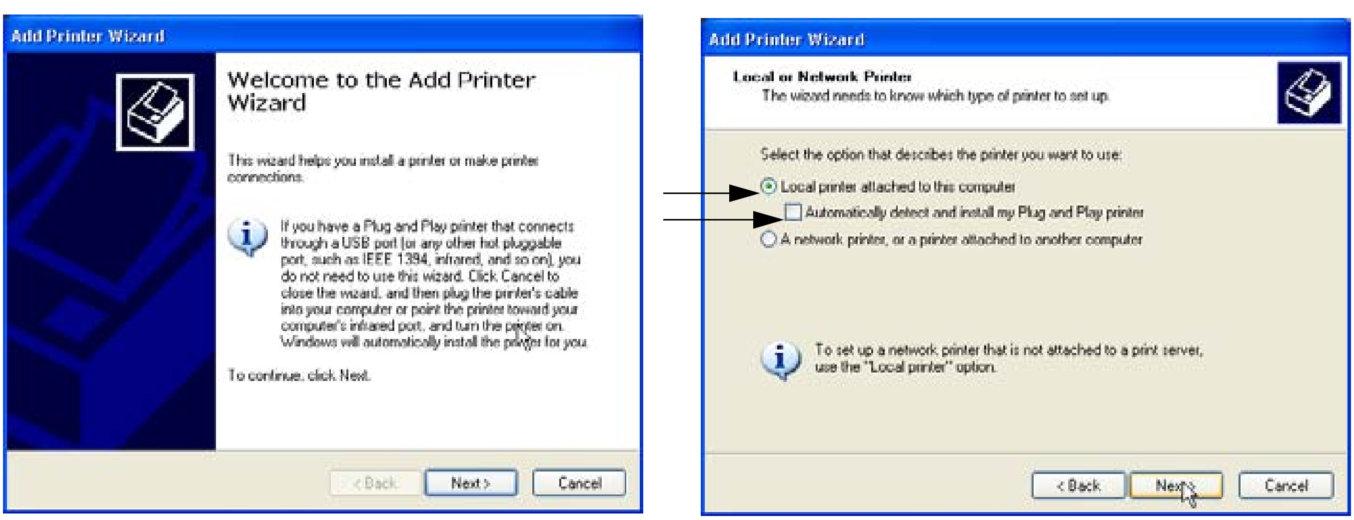


Figure 3-21 Add Printer Wizard

3-7-4 Printer Installation manually (cont'd)

7.) Select the corresponding Printer Port (e.g., Figure 3-22 = USB001) and click NEXT.

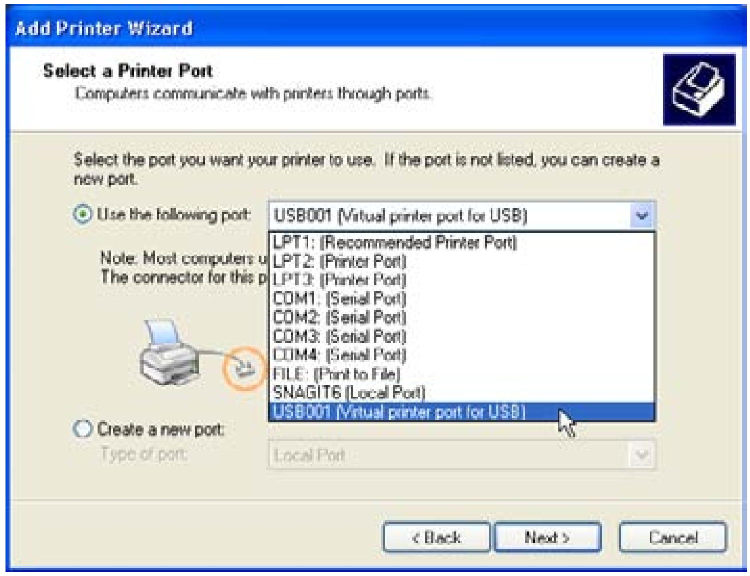


Figure 3-22 Select Printer Port

8.) In the following window select the HAVE DISK button.

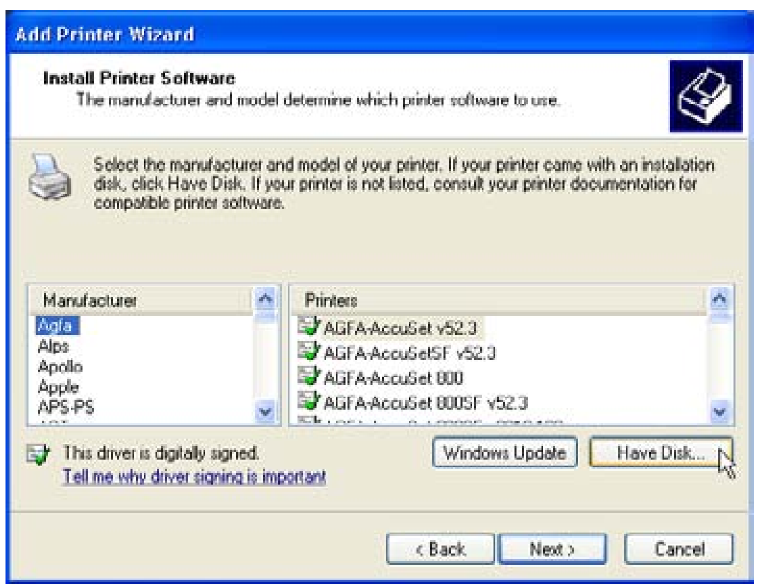


Figure 3-23 Have Disk...

9.) Use the BROWSE button to search the Printer Driver path (**R:\system\periph\xxxx**).

3-7-4 Printer Installation manually (cont'd)

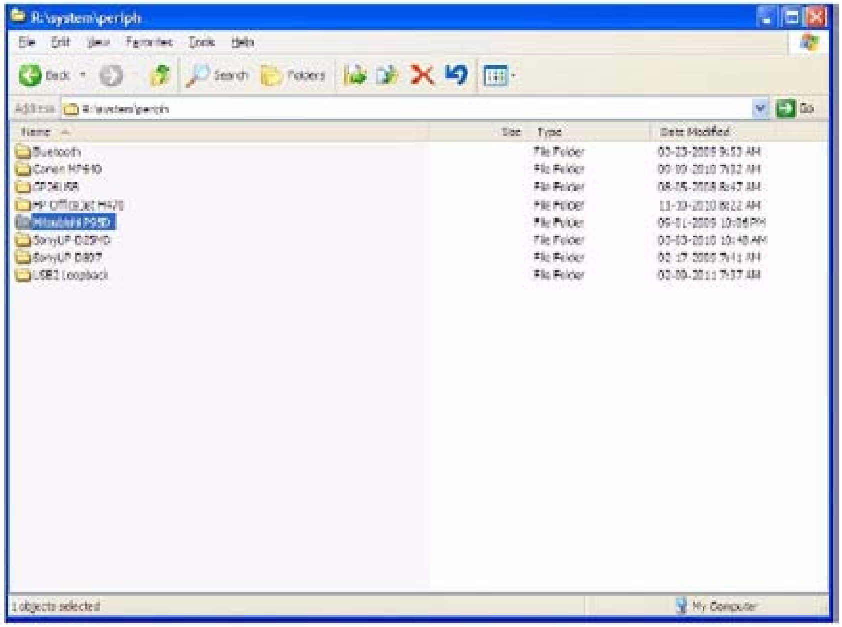


Figure 3-24 Select Printer Driver path (R:\system\periph\....)

10.) Click OPEN, select the “xxx.inf” file and click OPEN again.

11.) Verify the selected Printer Driver path and confirm with OK.

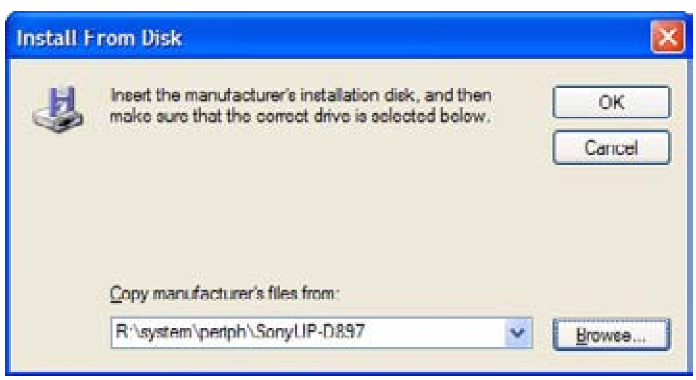


Figure 3-25 verify selected Printer Driver path

12.) Select the manufacturer and model of your printer and confirm with the NEXT button.

3-7-4 Printer Installation manually (cont'd)

13.) Assign a name, decide if printer should be used as default printer and confirm with NEXT.

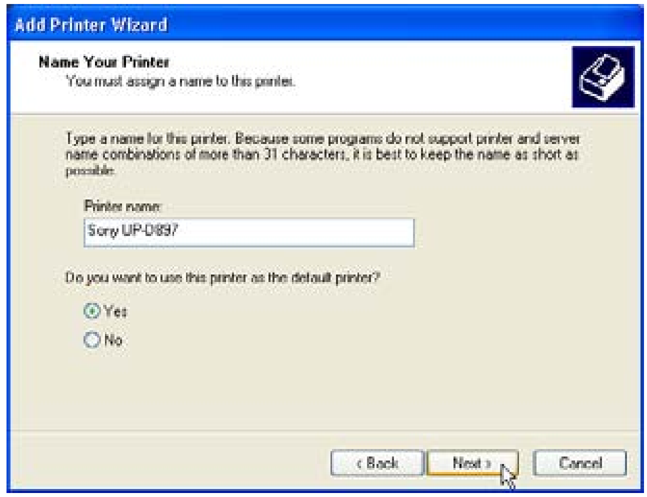


Figure 3-26 Assign name

NOTE: If the "Printer Sharing" window appears, select 'Do not share this printer' and confirm with NEXT.

14.) The "Complete the Add Printer Wizard" window appears on the screen.

Figure 3-27 Complete manual Printer Installation

15.) Complete the manual Printer Installation with the FINISH button.

NOTE: If the message "The software you are installing for this hardware has not passed Windows ...." appears, click CONTINUE ANYWAY.

16.) Close all open windows, close the "System Setup" with SAVE & EXIT and restart the system (turn off and on the system).

NOTICE After boot up of the system, verify the correct settings in the printer "Properties", see: Section 3-7-5 "Adjustment of Printer Settings" on page 3-36.
Afterwards assign the Printer to the remote keys **P1**, **P2**, **P3** and/or **P4**, see: Section 3-7-6 "Remote Control Selection" on page 3-43.

3-7-5 Adjustment of Printer Settings

1.) After system restart, press the **UTILITIES** key on the control panel.
2.) In the “Utilities” menu select SYSTEM SETUP to invoke the setup desktop on the screen.
3.) On the left side of the screen select CONNECTIVITY and then click on the **PERIPHERALS** tab.
4.) Select the desired printer from the Printer Settings pull-down menu and click the EDIT button.
5.) Confirm the warning message with the YES button. The **“Printer Properties”** appear.

Figure 3-28 Select the desired printer

To adjust the UP-D897 printer see: Section 3-7-5-1 "UP-D897 - Printer Settings" .

To adjust the P95D printer see: Section 3-7-5-2 "P95D - Printer Settings" .

To adjust the UP-D25MD Printer see: Section 3-7-5-3 "UP-D25MD - Printer Settings" .

WARNING ***After each printer installation, the leakage currents have to be measured acc. IEC 60601-1 resp. UL 60601-1.***

3-7-5-1 UP-D897 - Printer Settings

1.) Call up the **'Printer Preferences'**; operation see: Section 3-7-5 "Adjustment of Printer Settings" .

2.) Select the LAYOUT page (see: Figure 3-29 below) and select:

- Paper: **960x1280**
- Orientation: **Portrait**
- Interpolation Method: **Bilinear**

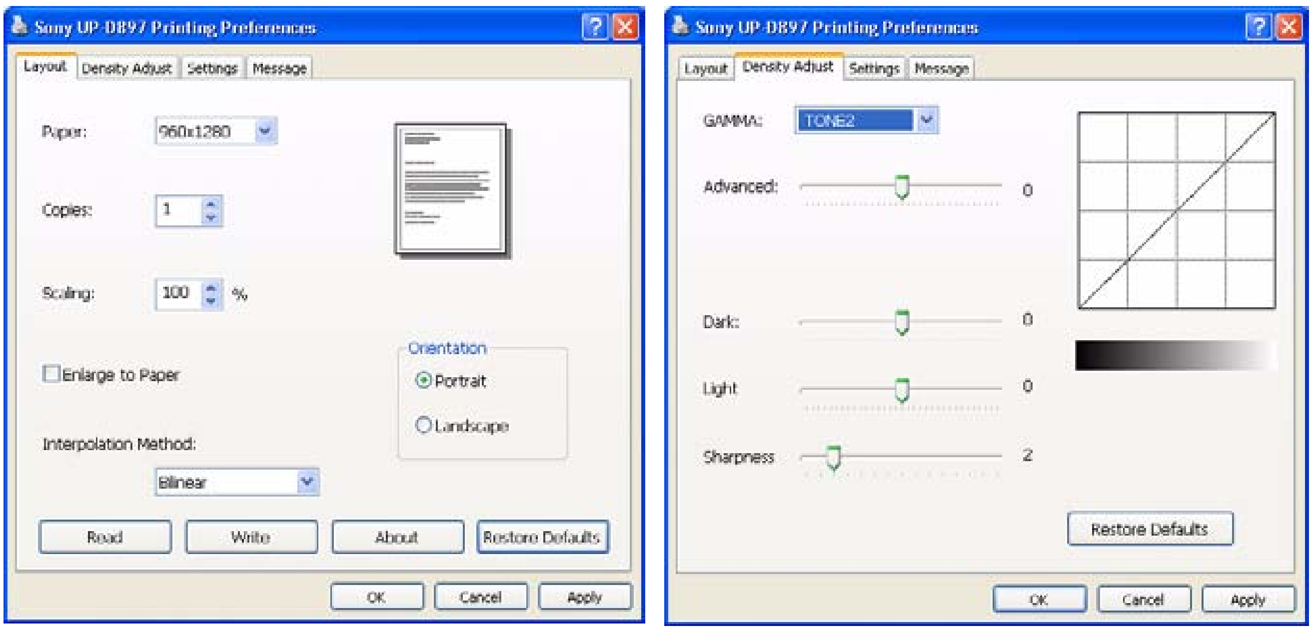


Figure 3-29 Layout + Density Adjust page

3.) Select the DENSITY ADJUST page (see: Figure 3-29 above) and select:

- Gamma: **TONE2**
- Sharpness = **0**; Dark = **0**; Light = **0** ; Sharpness = **2**

4.) For saving the adjusted printer settings click APPLY and then OK.
Finally close the 'Printers' -window with the close button and exit System Setup with SAVE&EXIT.

5.) Assign the Printer to the remote keys **P1**, **P2**, **P3** and/or **P4** with the save button;
see: Section 3-7-6 "Remote Control Selection" on page 3-43.

3-7-5-2 P95D - Printer Settings

1.) Call up the **'Printing Preferences'**; operation see: Section 3-7-5 "Adjustment of Printer Settings" .
2.) Select the **STANDARD** page (see: Figure 3-30 below) and select:
  - Paper Size: **1280x960**
  - Orientation: **Portrait**
3.) Select the **OPTIONS** page (see: Figure 3-30 below) and select:
  - Interpolation Method: **Bicubic**

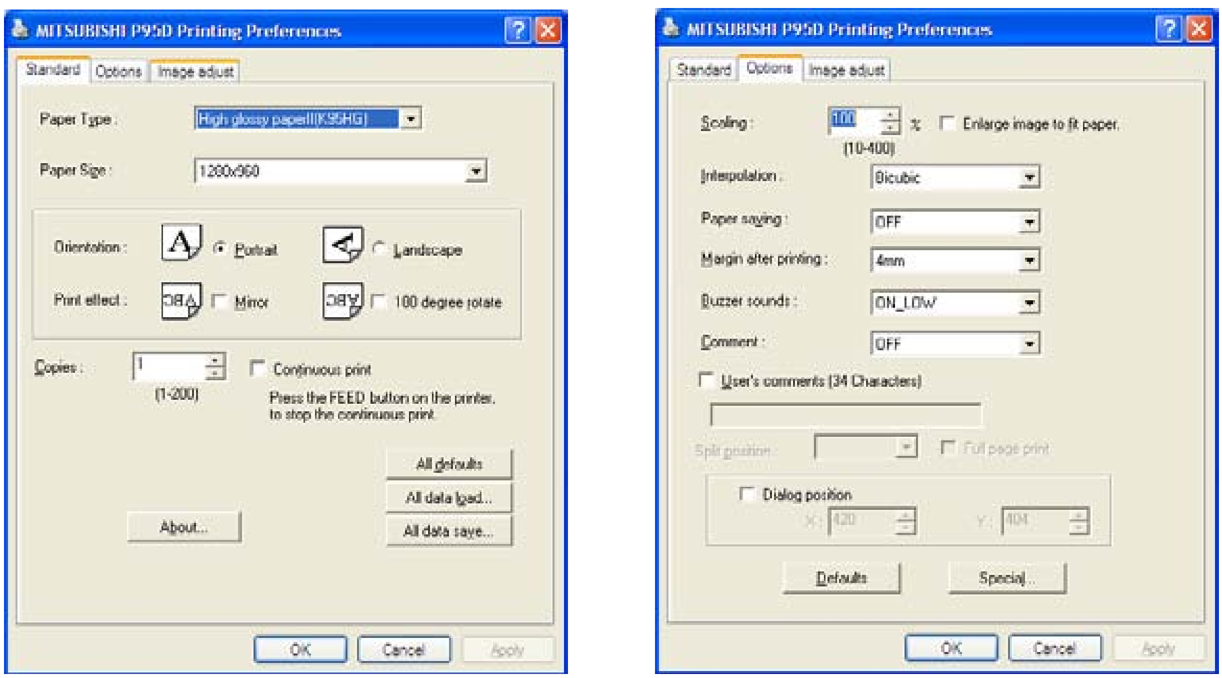


Figure 3-30 Standard & Options page

3-7-5-2 P95D - Printer Settings (cont'd)

4.) Select the IMAGE ADJUST page (see: Figure 3-31 below) and select:
- Simple : brightness: 3, Contrast : -7

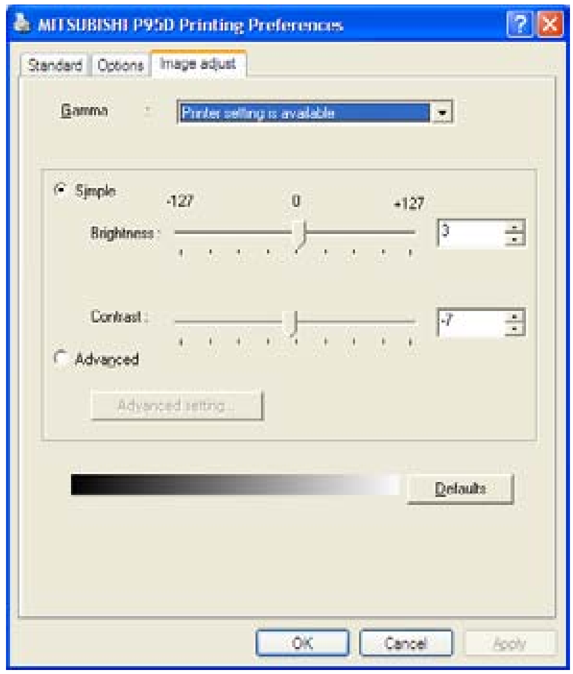


Figure 3-31 Image Adjust page

5.) For saving the adjusted printer settings click APPLY and then OK.
Finally close the 'Printers' -window with the close button and exit System Setup with SAVE&EXIT.

6.) Assign the Printer to the remote keys **P1**, **P2**, **P3** and/or **P4** with the save button;
see: Section 3-7-6 "Remote Control Selection" on page 3-43.

3-7-5-3 UP-D25MD - Printer Settings

1.) Call up the **'Printer Preferences'**; operation see: Section 3-7-5 "Adjustment of Printer Settings" .

NOTICE Settings for Paper Size MUST match with the used Paper (large/small) and also the right color ink cartridge has to be used. Otherwise you will get an error message at printing.

2.) Select the PAPER page and select:

- Paper Size: UPC-21L (large) / **UPC-21S** (small)
- Orientation: **Landscape** (recommended when using large paper size)
- **High Speed** (check mark on)

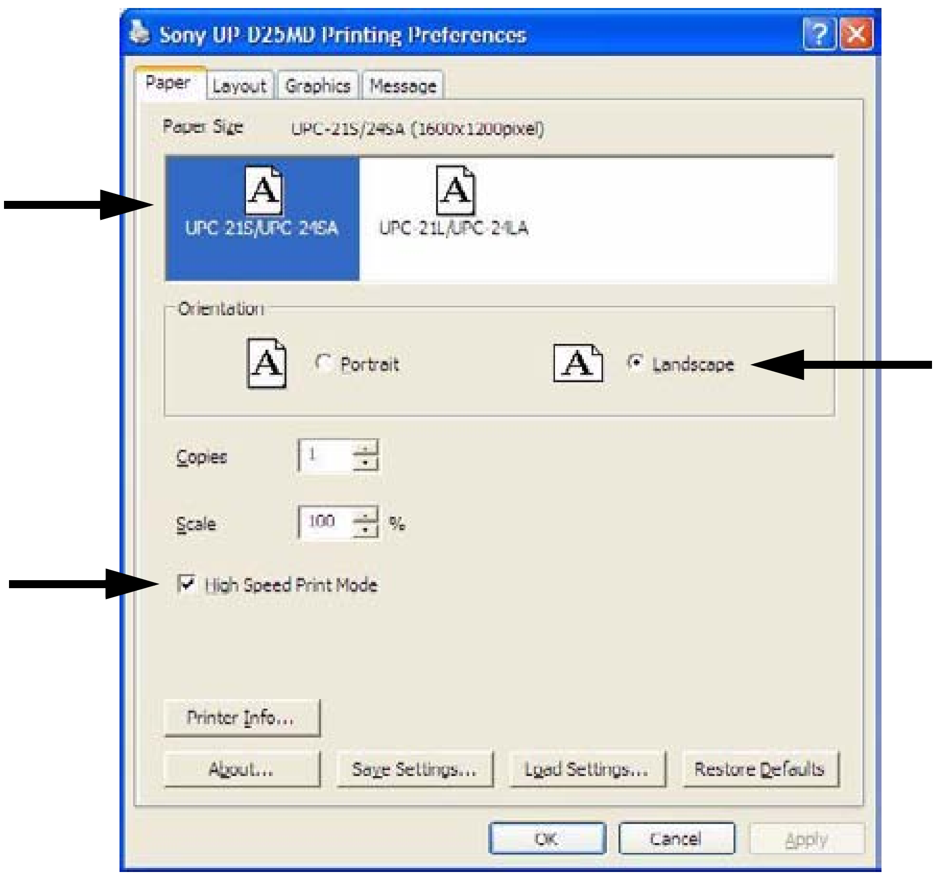


Figure 3-32 Paper page

3-7-5-3 UP-D25MD - Printer Settings (cont'd)

3.) Select the **GRAPHICS** page. From the "Color Adjust" pop-up menu select:

a.) Color Balance: Cyan = **0**; Magenta = **0**; Yellow = **0**

b.) Gray Balance: X =50, Y=50

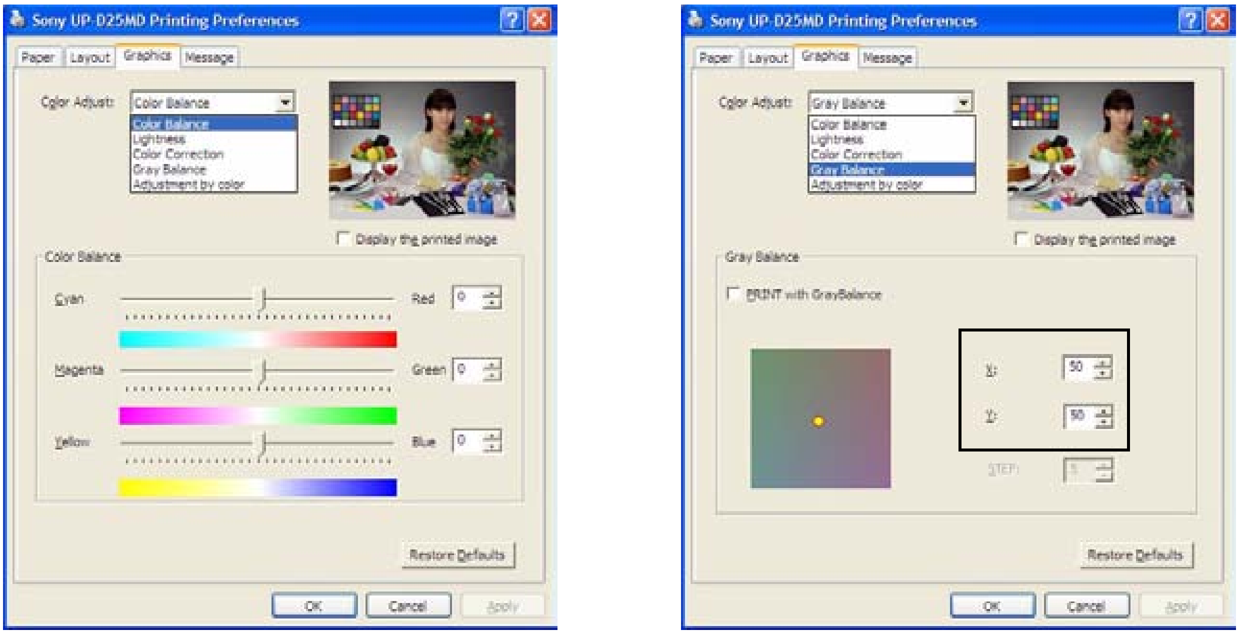


Figure 3-33 Graphics page (Color Balance + Gray Balance)

c.) Color Correction: set **Printer Hardware Color Correction**

d.) Lightness: Sharpness = **7** or **8**; Dark = **0**; Gamma = **0**; Light = **0**

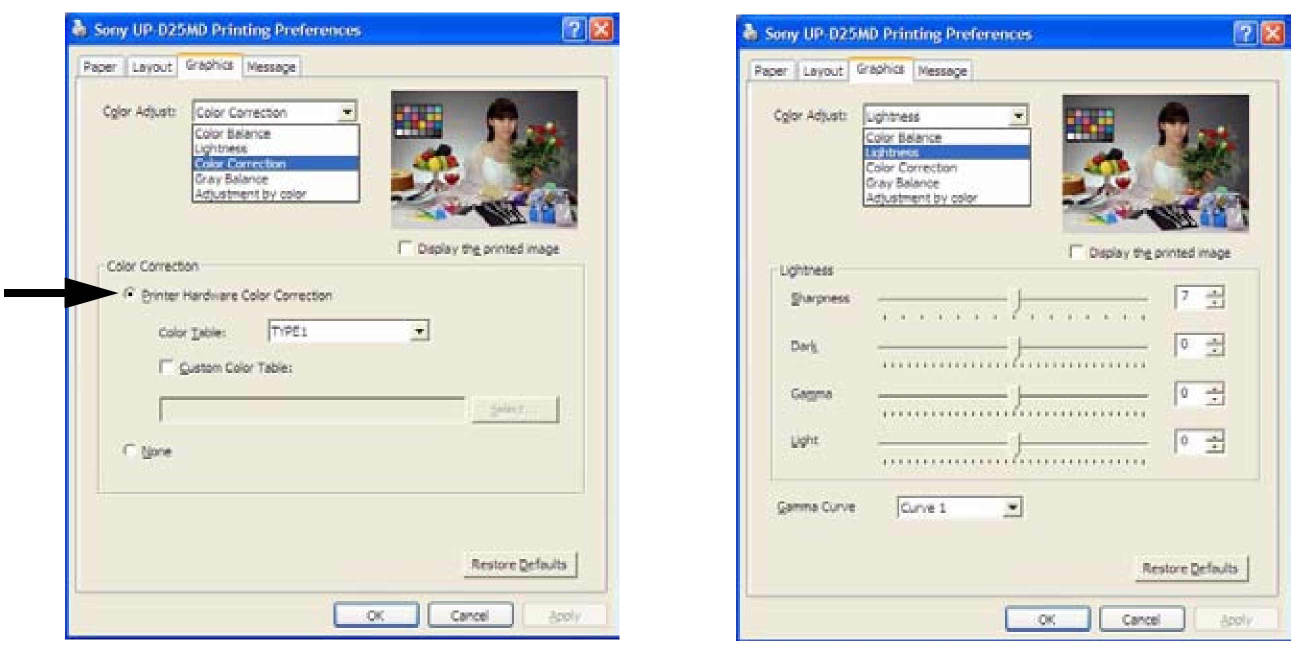


Figure 3-34 Graphics page (Color Correction + Lightness)

e.) Adjust Value : Select nomal.

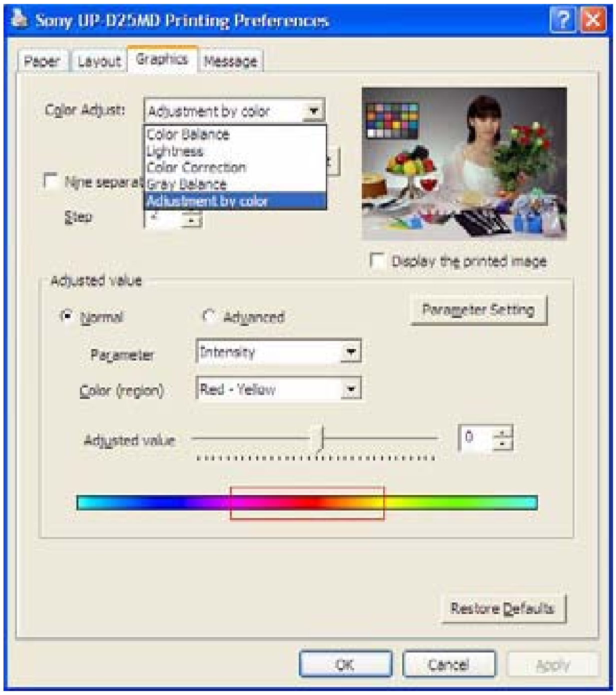


Figure 3-35 Graphics page (Adjustment by color)

4.) For saving the adjusted printer settings click APPLY and then OK.
Finally close the 'Printers'-window with the close button and exit System Setup with SAVE&EXIT.

5.) Assign the Printer to the remote keys **P1**, **P2**, **P3** and/or **P4** with the save button;
see: Section 3-7-6 on page 3-43.

3-7-6 Remote Control Selection

To assign an auxiliary device (e.g., printer) to the remote keys **P1**, **P2**, **P3** and/or **P4**:

1.) Press the **UTILITIES** key on the control panel.
2.) In the “Utilities” menu select SYSTEM SETUP to invoke the setup desktop on the screen.
3.) On the left side of the screen select CONNECTIVITY and then click the **BUTTON CONFIGURATION** tab.

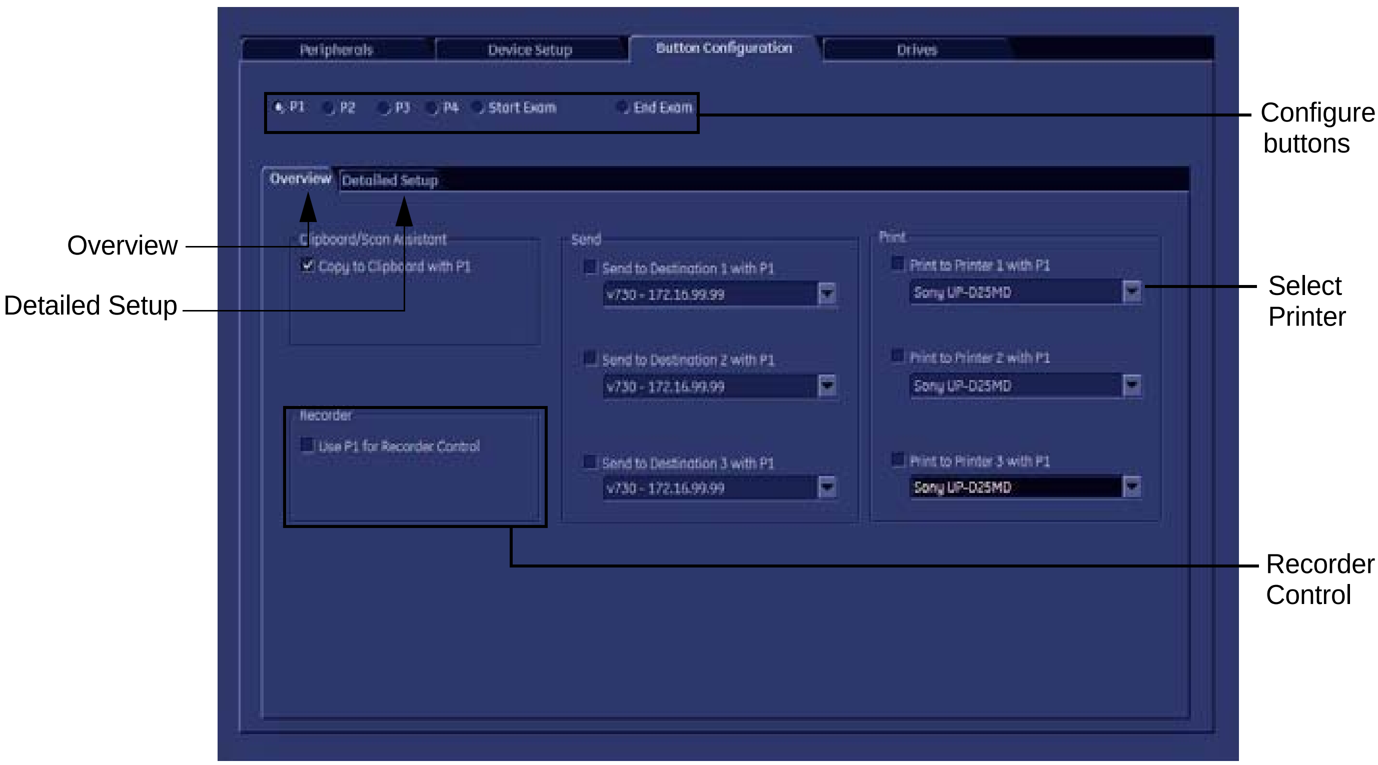


Figure 3-36 System Setup - Connectivity - BUTTON CONFIGURATION page (Overview)

- **Overview** tab:
  - Configure “Remote” Buttons: Select the desired remote control button.
  - Select Printer: Check mark and select the desired Printer for the remote control button.
  - Recorder Control: Check mark this item to use the selected **P?** key for Recorder Control.

NOTE: Optionally the Printer Remote Control can be done by the Foot switch.
(refer to: Figure 3-20: System Setup - Connectivity - PERIPHERALS page on page 3-32)

- **Detailed Setup** tab:
  - If it is desired, check mark “Use Report Printer for Reports”

3-7-6-1 Report Printer Selection

1.) Click on the **PERIPHERALS** tab.
(refer to:*Figure 3-20: System Setup - Connectivity - PERIPHERALS page on page 3-32*)
2.) Select the desired Report Printer from the drop-down menu.

NOTICE The selected Report Printer is usually used for printing reports and images from the Archive.

Section 3-8
System Configuration

3-8-1 System Setup

Modifications of system parameters and settings are supported by 4 major groups.
Each major group contains diverse dialog pages and sub windows.

- **General:** Date, Time, Clinic Name, (EUM) Language, Screen saver, etc.
- **User Settings:** to save User programs, 3D/4D programs, Auto Text, Doppler 2D Refresh, etc.
- **Patient Info Display:** Drop Down Management, Capitalize Letter in Patient Names, etc.

- **Service tab:** conncet the USB “standard GE” dongle and enter the “standard GE revolving” password (change every six months_ to get access to the Service Tools functions.
- **System Info:** shows which Software/Hardware version is installed in the system
- **Options:** shows which options are installed in the system
  For information on configuring Software Options refer to Section 8-7 on page 8-14

- **Peripherals:** Video Norm selection, Foot switch assignment, Add Printer, Edit Printer settings, etc.
- **Device Setup:** to set up all DICOM, Archive and Network configuration nodes
- **Button Configuration:** to adjust assignment of Remote keys **P1**, **P2**, **P3** and **P4**,... (e.g, Printer selection)
- **Drives:** USB and Network drives: stop devices, map network drive, Erase CD

- **System Configuration:** Save/Load Settings only, Save/Load/Delete Full System Configuration
- **Image Archive:** to save or load Image Archive

NOTICE More detailed information pertaining System Setup adjustments is found in the Basic User Manual; see: Table 9-10, “System Manuals - Voluson® S8 / Voluson® S6,” on page 9-16.

3-8-1-1 To invoke the Setup procedure:

1.) Press the **UTILITIES** key on the control panel.
2.) In the “Utilities” menu select SYSTEM SETUP to activate the setup desktop screen.
3.) Select the corresponding major group from the left side of the screen and then click the desired tab.

In general operations are done with the trackball and the trackball keys (mouse emulation).

Trackball (mouse position):
positions the pointing device (arrow) on the desktop

left trackball key (left mouse button):
sets, fixates markers and activates pages/buttons etc. marked by the pointing device

upper trackball key (right mouse button):
no function in system desktop

right trackball key (left mouse button):
sets, fixates markers and activates pages/buttons etc. marked by the pointing device

3-8-1-2 How to enter Date and Time

1.) Invoke System Setup as described in Section 3-8-1-1 on page 3-44.
2.) On the left side of the screen select GENERAL and then click on the **GENERAL** tab.

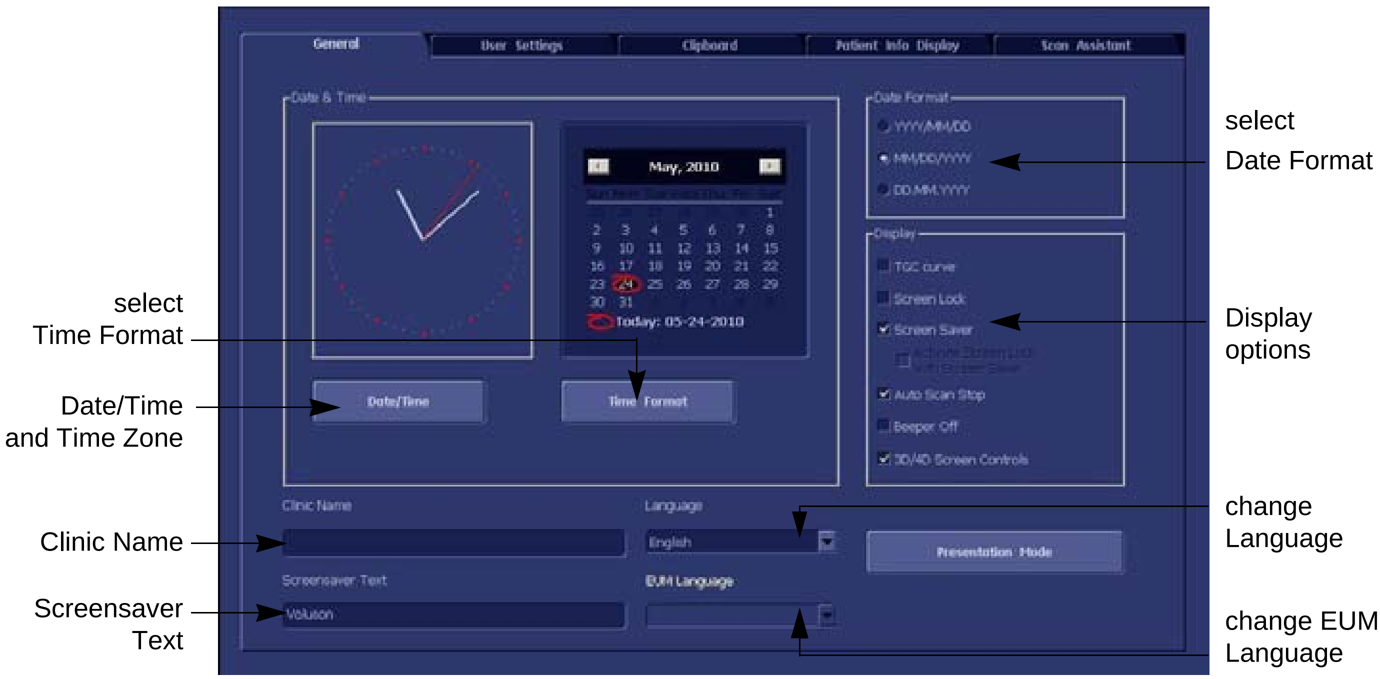


Figure 3-37 System Setup - General - GENERAL page

3.) Select the “Date Format” (only one can be active).
4.) Click the DATE/TIME button to activate a sub dialog window to enter date, time and time zone.
5.) Click the TIME FORMAT button to activate a sub dialog window to choose preferred time format.
6.) Select the “Date Format” display.
7.) Click SAVE&EXIT to save Settings and exit System Setup.

The system will be rebooted.

3-8-1-3 How to enter Hospital Name

1.) Invoke System Setup as described in Section 3-8-1-1 on page 3-44.
2.) On the left side of the screen select GENERAL and then click on the **GENERAL** tab.
3.) Select the text box to enter a new “Clinic Name” with the keyboard.
4.) Click SAVE&EXIT to save Settings and exit System Setup.

The clinic name will be copied into the Hospital ID in the information header.

3-8-1-4 How to change Language and/or EUM Language

1.) Invoke System Setup as described in Section 3-8-1-1 on page 3-44.
2.) On the left side of the screen select GENERAL and then click on the **GENERAL** tab.
3.) Select the desired language from the pop-up menu.
4.) Click SAVE&EXIT to save Settings and exit System Setup.

NOTE: After changing the language the system has to reboot.

3-8-1-5 How to activate Screen Lock

1.) Invoke System Setup as described in Section 3-8-1-1 on page 3-44.
2.) On the left side of the screen select GENERAL and then click on the **GENERAL** tab.
3.) Check mark "Screen Lock".
   a.) If no password previously entered, the following dialog appears.

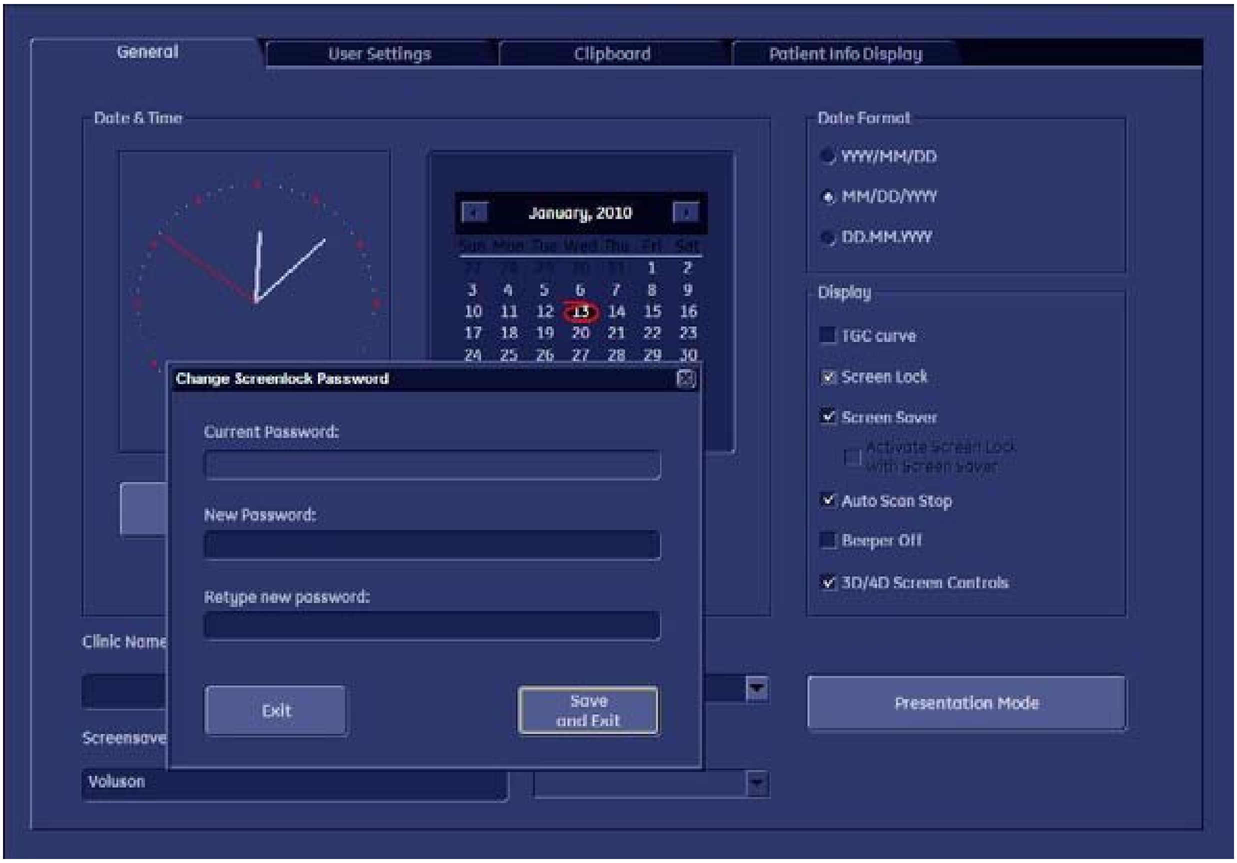


Figure 3-38 Screenlock Password

   b.) Enter "New Password".

NOTE: A new screen lock password must be at least 6 characters long and has a maximum length of 80 characters. The password must contain at least 2 non-letter characters, 0...9 or !@#$%^*().

   c.) "Retype new Password" and then click SAVE&EXIT to save new screen lock password.
4.) Click SAVE&EXIT to save Settings and exit System Setup.

NOTE: If screen is locked you have to enter the password to get full system control.

If password is unknown click EMERGENCY. This enables standard - but limited - operation.

NOTICE The Screen Lock password cannot be reset by the user! Please contact your GE service representative.

3-8-1-6 How to adjust function of the Footswitch (Left/Middle/Right)

1.) Invoke System Setup as described in Section 3-8-1-1 on page 3-44.

2.) On the left side of the screen select CONNECTIVITY and then click on the **PERIPHERALS** tab.

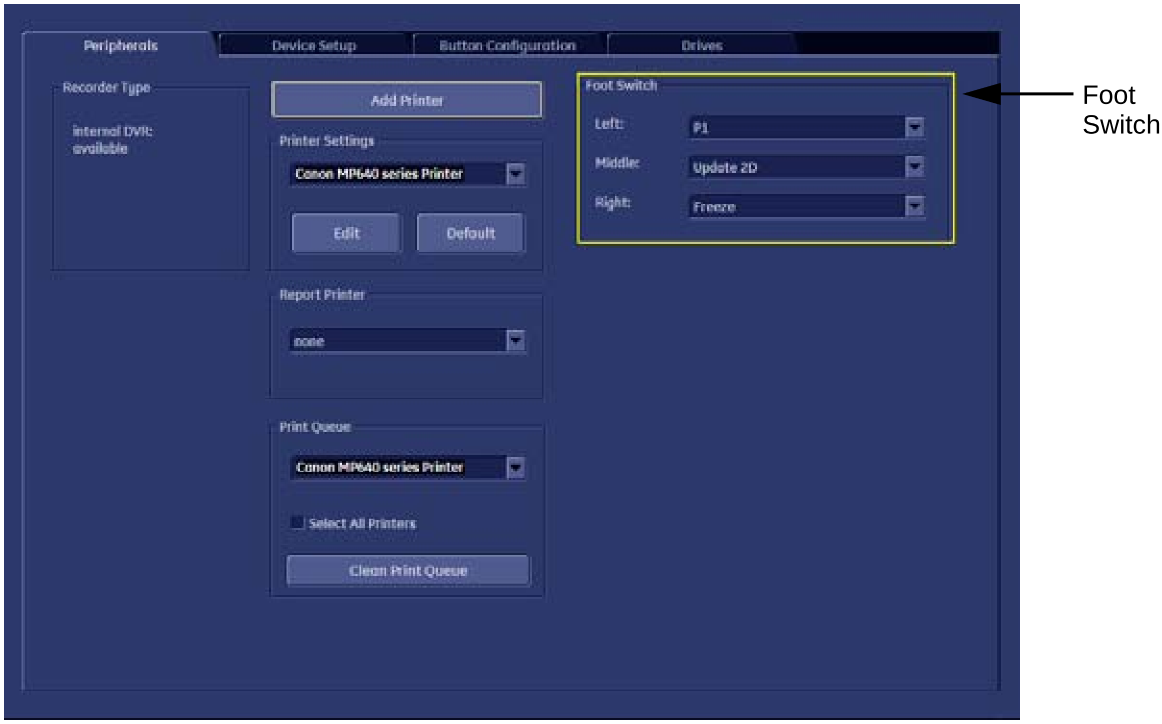


Figure 3-39 System Setup - Connectivity - PERIPHERALS page

3.) Select desired function of the Footswitch Left, Middle and Right.

4.) Click SAVE&EXIT to save Settings and exit System Setup.

3-8-1-7 How to change the Keyboard Layout

see: Chapter 6 - Modification of Keyboard Layout, on page 6-11.

3-8-1-8 How to configure Service Platform

see: Chapter 7 - To configure Service Platform, on page 7-14.

3-8-2 Measure Setup

Modifications of system parameters are supported by diverse dialog pages and windows on the measure setup desktop:

NOTICE Parameters and possible adjustments mostly depend on the selected Application!

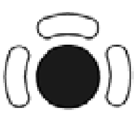
- **Measure & Calc** - shows all settings, which are used for generic measurements as well as calculations in different applications
- **Application Parameters** - to adjust: status on freeze for different modes, Manual Trace method, Calculation Ratio, etc.
- **Global Parameters** - to select: if the measurement results should be deleted (= Yes), or kept on screen (= No) as soon as cine mode is activated, cursor type and size, Font size and color of measure results, position of measure results for different modes, etc.

NOTICE More detailed information pertaining Measure Setup adjustments is found in the Basic User Manual of the Voluson® S8 / Voluson® S6;
see: Table 9-10, “System Manuals - Voluson® S8 / Voluson® S6,” on page 9-16.

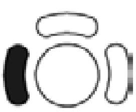
3-8-2-1 To invoke the Setup procedure:

1.) Press the UTILITIES key on the control panel.
2.) In the “Utilities” menu press MEASURE SETUP to activate the setup desktop screen.

In general operations are done with the trackball and the trackball keys (mouse emulation).

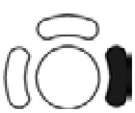


Trackball (mouse position):
positions the pointing device (arrow) on the desktop



left trackball key (left mouse button):
sets, fixates markers and activates pages/buttons etc. marked by the pointing device

upper trackball key (right mouse button):
no function in system desktop



right trackball key (left mouse button):
sets, fixates markers and activates pages/buttons etc. marked by the pointing device

3-8-3 On-Board Optional Peripherals

Mains outlet: AC outlet for on-board peripherals

Output voltage : 100~250V.

CAUTION **Modification of voltage setting only by an authorized service person!**
The maximum power consumption of equipment (inclusive of the color LCD monitor) connected to these outlets must not exceed 400VA!

Table 3-8 Approved Peripherals

Device	Manufacturer	Model	Connection	Comment
Digital B/W Video printer	SONY	UP-D897	USB-Port	
Digital B/W Video printer	Mitsubishi	P95D	USB-Port	
Digital Color Printer	SONY	UP-D25MD	USB-Port	
Digital Deskjet Printer (Bluetooth)	HP	Officejet H470	USB-Port (Blutooth)	
DVR	GEUK		Dedicated Connector	
Footswitch	Whanam Elec.		USB-Port	

3-8-4 External I/O Connectors

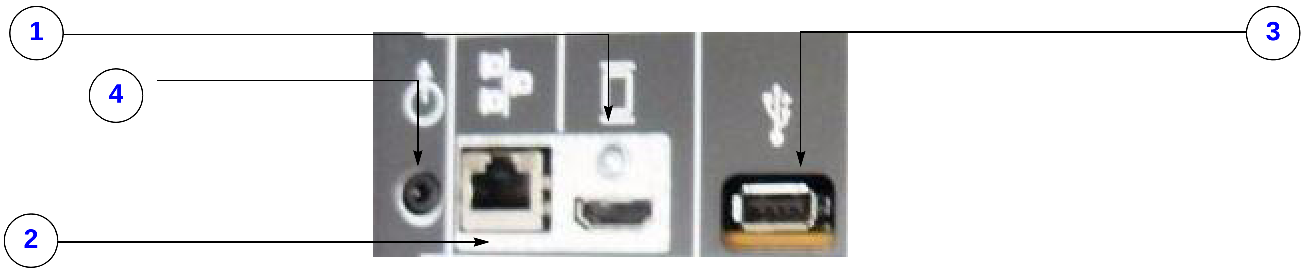


Figure 3-40 External I/O Connectors - on Rear of System

Table 3-9 External I/O Connector - Description

Item	Connector Name	Table Number	Description		
1	HDMI Out	Table 3-11	Connector for external Monitor		
2	NETWORK	Table 3-12	DICOM input/output, twisted pair RJ-45 10/100 megabit/s		
3	USB	Table 3-13	USB-2.0 port		
4	AUDIO	Table 3-13	Connector for External Speaker		

Figure 3-41 External I/O Connectors - on TOP OPIO

Table 3-10 External I/O Connector - Description

Item	Connector Name	Table Number	Description		
1	USB	Table 3-13	USB-2.0 port		
2	USB	Table 3-13	USB-2.0 port		

3-8-4-1 External I/O Pin Outs

Table 3-11 HDMI out Connector, 19 Pin

Pin No	Output Signal	Description
1 ~ 12	TMDS clock/data	TMDS clock/data
13	CEC	CEC
14	N/C	Reserved
14, 15	SCL/SDA	I2C Line
17	DDC/CEC/HEC	DDC/CEC/HEC
18	5V	Power
19	Hot plug	Hot plug

Table 3-12 Network Connector, RJ45 Modular 8 Pin

Pin No	Output Signal	Description
1	ETHER TD	Ethernet RD+
2	ETHER TD	Ethernet RD-
3	ETHER RD	Ethernet TD+
6	ETHER RD	Ethernet TD-
Others	NC	No connection

3-8-4-1 External I/O Pin Outs (cont'd)

Table 3-13 USB Connectors

Pin No	Output Signal	Description
1	VCC	USB Power Supply
2	- Data	USB Data (-)
3	+ Data	USB Data (+)
4	GND	USB Power Ground

Section 3-9
Available Probes

See *Chapter 9 - Probes, on page 9-17,* for part numbers to be used when ordering new or replacement service probes.

Section 3-10
Software/Option Configuration

For description refer to:

- Section 3-8-1 "System Setup" on page 3-44 and
- Section 3-8-2 "Measure Setup" on page 3-48

NOTICE More detailed information pertaining System Setup and Measure Setup adjustments is found in the Voluson® S8 / Voluson® S6 Basic User Manual, which is available in different languages.

Section 3-11
Connectivity Setup

The Voluson® S8 / Voluson® S6 ultrasound system can be connected to various connectivity devices. The following sections describe how to connect the system to a remote archive/work station or a DICOM service, using a TCP/IP connection.

3-11-1 Connectivity Introduction

This section describes communication and connection options between the Voluson® S8 / Voluson® S6 ultrasound unit and other devices in the hospital information system.

The following scenarios are covered:

- stand-alone Voluson® S8 / Voluson® S6 scanner; see: Section 3-11-1-3 on page 3-55.
- Voluson® S8 / Voluson® S6 and one or several PC workstations - with Software 4D View installed - within a “Sneaker Net” environment. (“Sneaker Net” means that you use a DVD/CD to move data because no network is available); see: Section 3-11-1-4 on page 3-55.
- Voluson® S8 / Voluson® S6 and DICOM server in a network; see: Section 3-11-1-5 on page 3-55.

3-11-1-1 The Dataflow Concept

Communication between the Voluson® S8 / Voluson® S6 ultrasound unit and other information providers on the network takes the form of data flows. Each dataflow defines the transfer of patient information from either an input source to the unit, or from the unit to an output source (see examples in Figure 3-42 on page 3-54).

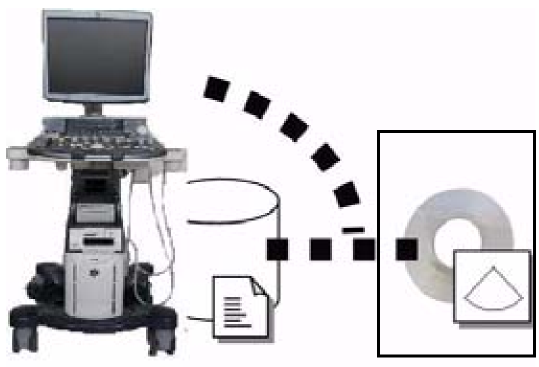
Patient information can include demographic data and images, as well as reports and Measurement and Analysis (M&A) data.

A dataflow is a set of pre-configured services. Selecting a dataflow will automatically customize the ultrasound unit to work according to the services associated with this dataflow.

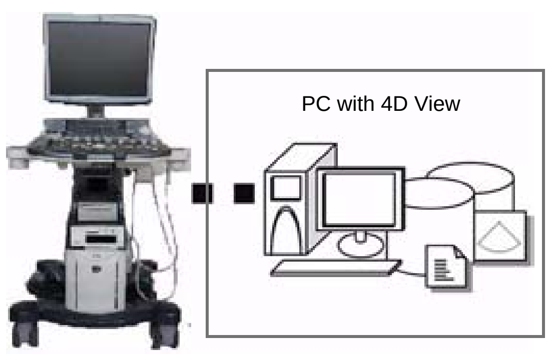
By utilizing data flows, the user can configure the Voluson® S8 / Voluson® S6 ultrasound unit to optimally meet the needs of the facility, while keeping the user interface unchanged. Once the dataflow is selected, the actual location of the database is entirely transparent.

3-11-1-2 Dataflow Examples

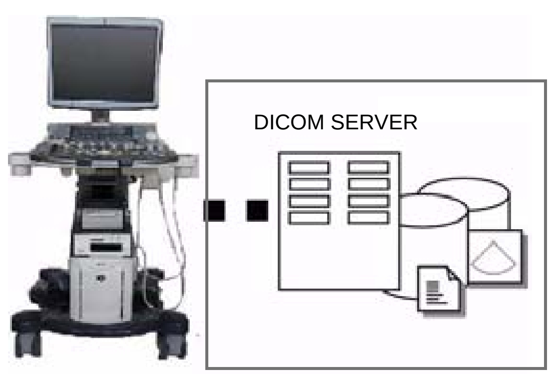
The local database is used for patient archiving.
Images are stored to internal hard drive.



The local database is used for patient archiving.
Afterwards images are stored to a DVD/CD or external USB device, etc.



A remote database is used for patient archiving.
Images are also stored to a remote archive.



Search in the DICOM Modality Worklist,
the patient found is copied into local database.

The patient information and the examination results are stored to the local database.

Images are stored to a DICOM server and to an image network volume on the local hard drive.

Figure 3-42 Examples of Dataflows

3-11-1-3 Stand-alone Voluson® S8 / Voluson® S6

If digital images or 3D/4D data sets are stored, they should be saved in the Archive (Image Management System software).

For Image Management functionality refer to the Basic User Manual of the Voluson® S8 / Voluson® S6.

NOTICE To avoid loss of essential data, it is highly recommended to **export/backup patient data** as well as measurements **at least once a month**.

Physical Connection:

No network connection needed.

3-11-1-4 Voluson® + PC (with 4D View Software) within a “Sneaker Net”

A PC (one or several with 4D View software installed) is used for review and work on studies acquired on one or more Voluson® S8 / Voluson® S6 scanners without being connected in a network.

The images are first stored on the Voluson® S8 / Voluson® S6 scanner’s hard drive (Archive) and then exported from the scanner’s hard drive to a sneaker device (e.g., DVD/CD), and finally imported from the sneaker device to the “4D View” PC’s internal hard drive.

For Image Management functionality refer to the Basic User Manual of the Voluson® S8 / Voluson® S6.

NOTICE To avoid loss of essential data, it is highly recommended to **export/backup patient data** as well as measurements **at least once a month**.

Physical Connection:

No network connection needed.

3-11-1-5 Connection between Voluson® and DICOM Server

In this configuration, the Voluson® S8 / Voluson® S6 is configured to work with a DICOM server in a network environment. Usually, this will be the hospital network. Images are first saved on the local image buffer on the scanner. At the end of the examination, the images are sent to the DICOM server via a DICOM spooler. This scenario requires that the scanner is configured to be connected to the DICOM server.

Physical Connection:

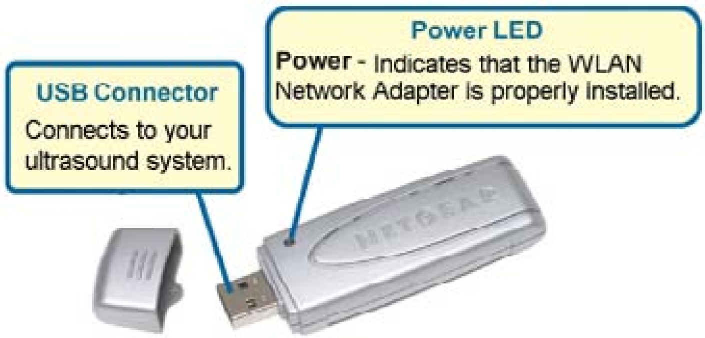
You will need one network cable.

1.) Connect one end of the cable to the Ethernet connector on the Voluson® S8 / Voluson® S6.
2.) Connect the other end of the cable to the wall outlet.

NOTE: If a Peer-to-Peer Network is connected to the hospital’s network, you may connect the Voluson® S8 / Voluson® S6 to the Peer-to-Peer Network.

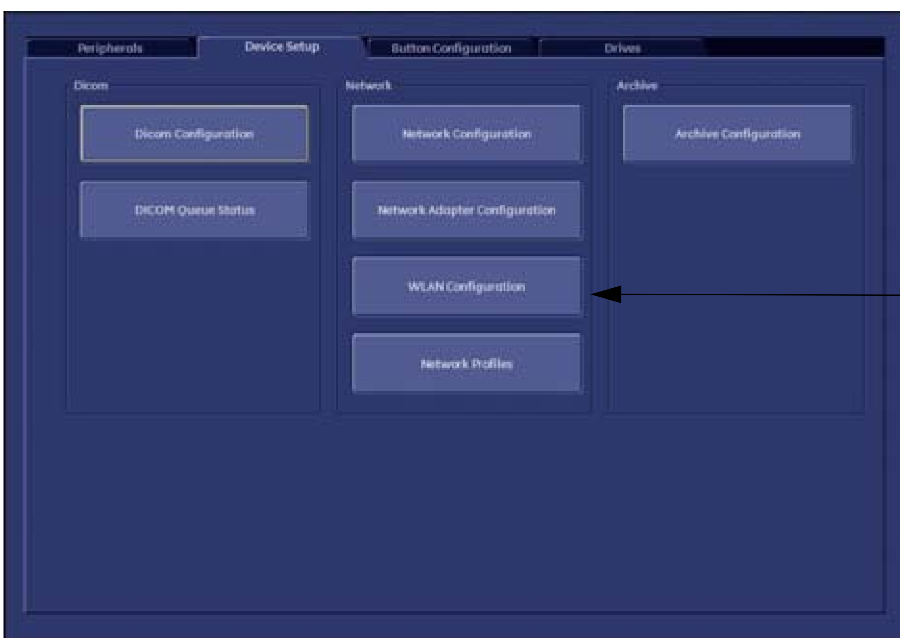
For more details refer to Section 3-12 "Network IP Address Configuration" on page 3-59.

3-11-2 Wireless Network Configuration



NOTICE To configure the Voluson® S8 / Voluson® S6 ultrasound unit to work with WLAN, **the hospital's network administrator has to provide the required information.**

1.) Connect the Wireless Network adapter as described in Section 3-5-5 on page 3-19.
2.) Press the **UTILITIES** key on the control panel and select SYSTEM SETUP to invoke setup desktop.
3.) On the left side of the screen select CONNECTIVITY and then click the **DEVICE SETUP** tab.
4.) Click the WLAN CONFIGURATION button.



[WLAN Configuration] button

Figure 3-43 WLAN Configuration button

3-11-2 Wireless Network Configuration (cont'd)

5.) Select the country where you will use the wireless USB adapter from the “pull-down menu” and then click AGREE.

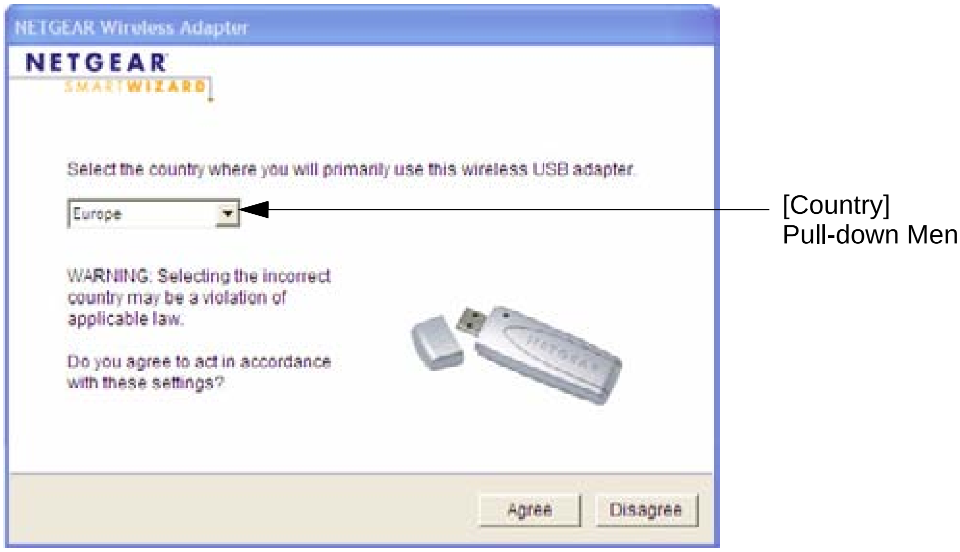


Figure 3-44 select the country

The Setup Wizard window appears:

Figure 3-45 Setup wizard - Settings

6.) Enter “Network Name (SSID)” and check/adjust all other settings.

NOTE: For detailed description of available parameters, refer to Section 3-11-2-1 "Description of “Netgear” Configuration Parameters" on page 3-58.

7.) Type a suitable name for the new profile into the “Profiles” box and then click SAVE PROFILE.

8.) Finally click FIND NETWORK and wait a few seconds....

3-11-2 Wireless Network Configuration (cont'd)

After a few seconds waiting, following information appear in the status bar at the bottom of the page. You have successfully installed WLAN, are connected to a wireless network and ready to communicate!

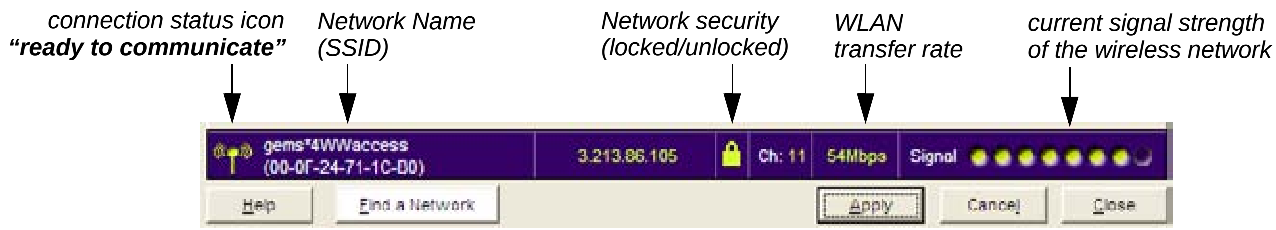


Figure 3-46 Status bar at bottom of the page

9.) Click APPLY and CLOSE to finish configuration.

NOTICE **Once the Wireless Network is configured:**
After a few seconds waiting, the connection status icon indicates "ready to communicate" (see: Figure 3-46 above) and the other values are shown automatically, whenever the WLAN CONFIGURATION button (see: Figure 3-43 on page 3-56) is clicked.

3-11-2-1 Description of "Netgear" Configuration Parameters

Profiles **Type a suitable name for each new profile.** (As a recommendation, type Voluson).
If you do not enter a name in the Profile Name box, then the name Profile is used to save your settings.

Network Name (SSID) The Service Set Identification (SSID) name identifies the specific wireless network that you want the client adapter to access.
Type the Network Name (up to 32 alphanumeric characters) as provided by the hospital´s Network Administrator.

Note: The SSID in the wireless access point is the SSID you configure in the wireless USB adapter.
For the access point and wireless nodes to communicate with each other, all must be configured with the same SSID.

Note: You will not get a wireless network connection unless the SSID matches exactly what is configured in the access point.

Network Type Specifies the type of network in which your client adapter is installed.

Default: Access Point (Infrastructure)

Access Point (Infrastructure): Connect to an access point or router with the 802.11 infrastructure mode. For example, this mode is used when computers in a house connect to an access point that is attached to a router, which lets multiple computers share a single cable or DSL broadband Internet connection.

Computer-to-Computer (Ad Hoc): Connect directly to another computer(s) with the 802.11 ad hoc mode (or *peer to peer*). For example, Ad Hoc mode is used when Windows computers are configured with file and print sharing enabled and you want to exchange files directly between them.

Security These options are the wireless security features you can enable. The table below identifies the various basic wireless security options

Default**:** Disabled (no wireless security)

WEP Authentication: WEP Encryption key size. Identify one: 64-bit or 128-bit. The encryption key size must the wireless network settings.-Data Encryption (WEP) Keys. There are two methods for creating WEP data encryption keys.

Passphrase method: Enter a word or group of printable characters (case sensitive) and click the [Generate Keys] button.

Not all wireless devices support the passphrase method.

Manual method: For 64-bit WEP, enter 10 hex digits in the appropriate field. For 128-bit WEP, enter 26 hex digits.

These values are not case sensitive.

WPA-PSK: WPA-Pre-shared Key does perform authentication, uses 128-bit data encryption and

dynamically changes the encryption keys making it nearly impossible to circumvent.

Enter a word or group of printable characters in the Password Phrase box. These characters are case sensitive.

Note: Not all wireless adapter configuration utilities support WPA. Furthermore, client software is required on the client. Windows XP and Windows 2000 with Service Pack 3 do include the client software that supports WPA. Nevertheless, the wireless adapter hardware and driver must also support WPA.

CAUTION **WLAN security has to be adjusted to prevent viruses and to ensure data protection. Discuss settings with the hospital´s network administrator. He must provide the required information.**

Section 3-12
Network IP Address Configuration

NOTE: *Following Information must be provided by customer or hospital engineer before you can start:*
A Station name, AE Title, IP address and Port Number for the Voluson® S8 / Voluson® S6.
The IP addresses for the default gateway and other routers at the site for ROUTING INFORMATION.
Only if necessary (e.g. for Internet access).

1.) Press the **UTILITIES** key on the control panel.
2.) In the "Utilities" menu select SYSTEM SETUP to invoke the setup desktop on the screen.
3.) On the left side of the screen select CONNECTIVITY and then click the **DEVICE SETUP** tab.
4.) Click the NETWORK CONFIGURATION button, read the message and confirm with YES.

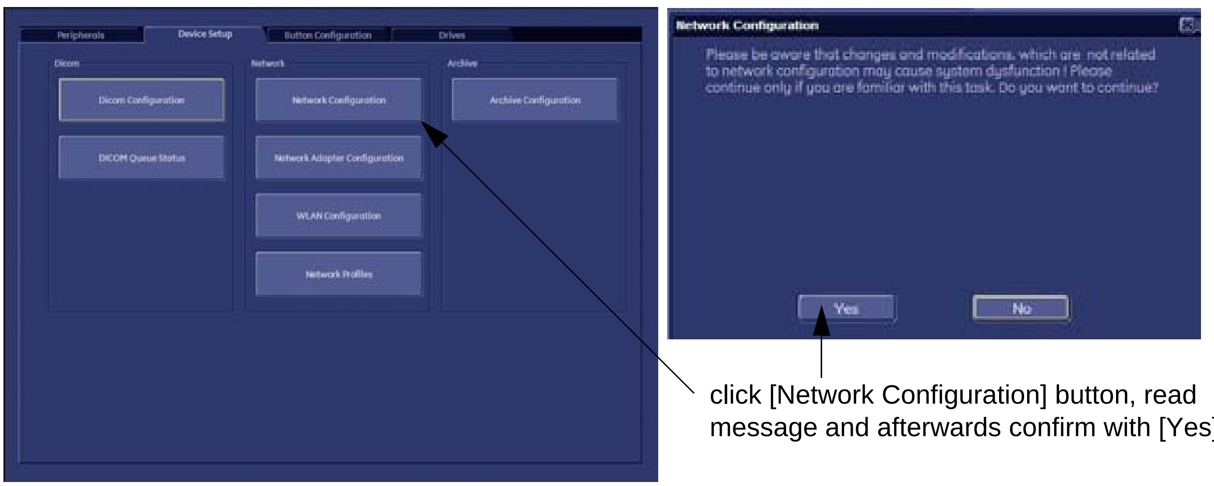


Figure 3-47 Network Configuration

5.) The "Internet Protocol (TCP/IP) Properties" dialog page appears.

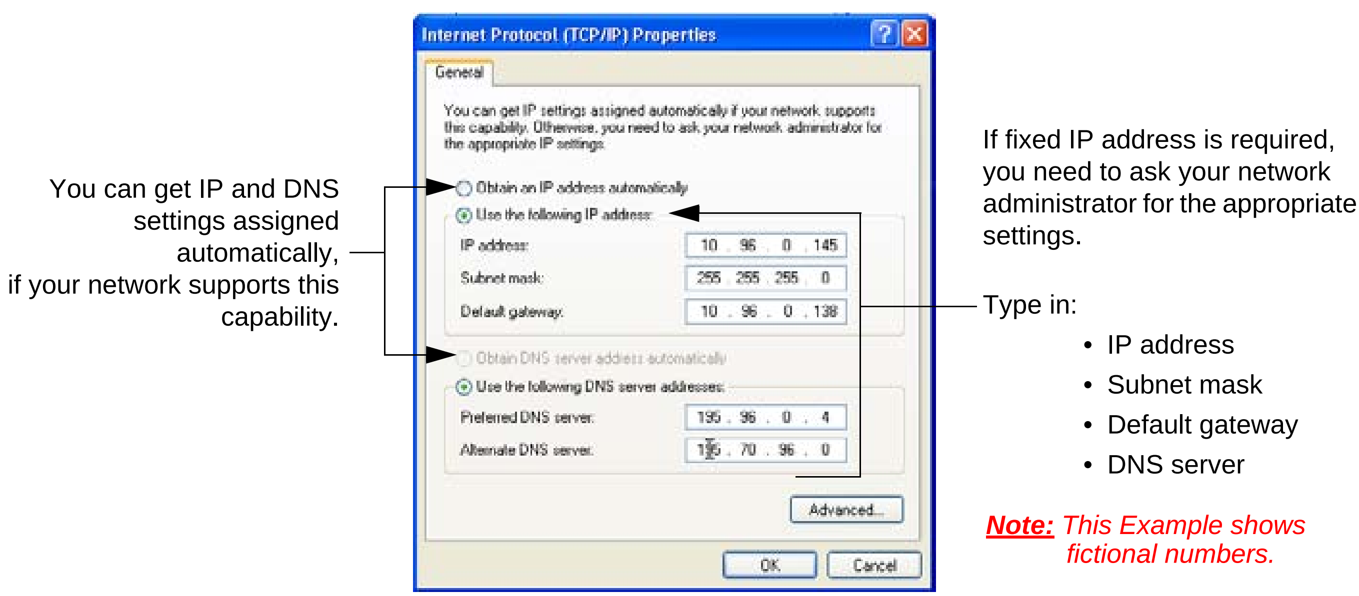
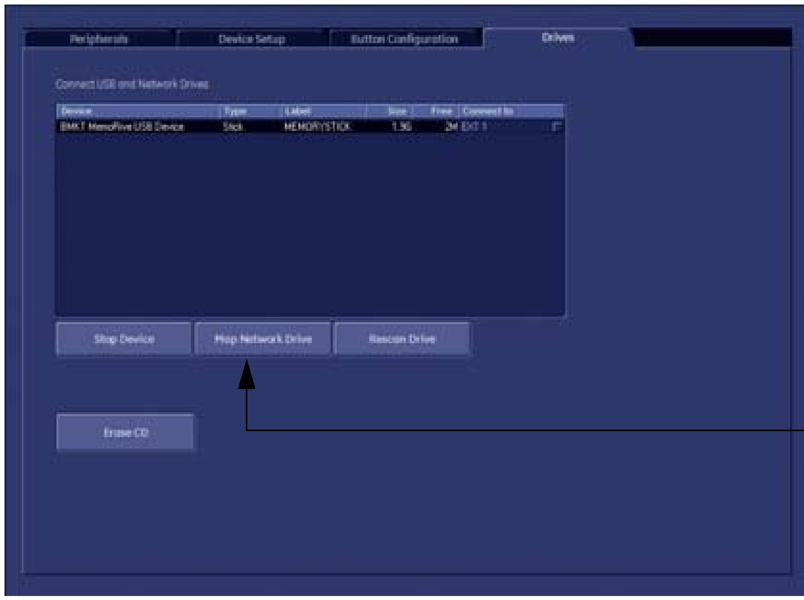


Figure 3-48 Internet Protocol (TCP/IP)

To specify a DICOM Address, follow the instructions of described in the Basic User Manual, Chapter 13 of the Voluson® S8 / Voluson® S6.

3-12-1 Map Network Drive

1.) Press the **UTILITIES** key on the control panel.
2.) In the “Utilities” menu select SYSTEM SETUP to invoke the setup desktop on the screen.
3.) On the left side of the screen select CONNECTIVITY and then click the **DRIVES** tab.



[Map Network Drive] button

Figure 3-49 System Setup - Connectivity - DRIVES page

4.) Select the MAP NETWORK DRIVE button to open a dialog where the system can be connected to a shared network drive of another server.

Figure 3-50 Map Network Drive window

NOTICE The MAP NETWORK DRIVE button is also accessible in the “Connect USB and Network Drives” dialog window that appears when pressing the **EJECT** (= F3) key on the alphanumeric keyboard.

5.) Enter the name of the shared network folder in the „Network Folder Name” field.
6.) Supply a valid user name and a password for this folder.

*NOTE: If you check the „Automatic Reconnect“ box, the system tries to establish the connection again when starting up.
Otherwise, the connection must be re-established manually after a shutdown or reboot.*

3-12-1 Map Network Drive (cont'd)

7.) Select the CONNECT button to establish the connection to the remote machine.
If successful, the DISCONNECT button becomes active.

NOTICE If there is an error during the connection, a warning message appears inside the dialog.
In this case, please verify the data in the dialog.

NOTICE If there already is a connection to the remote server, the CONNECT button is grayed.
To change the existing connection, first click on DISCONNECT and then enter the new settings.

WARNING ***Please make sure that the server you are connecting to is trustworthy and reliable. For details, contact your local system administrator.
If you backup Archive data to this server, all the patients' demographic data will be copied to this server!***

Section 3-13
Connectivity Setup Worksheet

Site System Information

Site:

Dept:

Voluson® S8 / Voluson®

Type:

Floor:

Room:

REV:

Comments:

CONTACT INFORMATION

Name	Title	Phone	E-Mail Address

TCP/IP Settings

System IP Settings

Name - AE Title:

IP Address:

Subnet Mask:

Default Gateway:

Remote Archive Setup

Name - AE Title:

IP Address:

Subnet Mask:

Default Gateway:

Server Name:

Remote DB User Name:

Services (Destination Devices)

	Device Type	Manufacturer	Name	IP Address	Port	AE Title
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

Section 3-13 Connectivity Setup Worksheet (cont'd)

Voluson® S8 / Voluson® S6

Host Name		Local Port	
AE Title			
IP Address	. . .	Net Mask	. . .

ROUTING INFORMATION

	Destination IP Addresses	GATEWAY IP Addresses
Default		. . .
ROUTER1	. . .	. . .
ROUTER2	. . .	. . .
ROUTER3	. . .	. . .

DICOM APPLICATION INFORMATION

	NAME	MAKE/REVISION	AE TITLE	IP ADDRESSES	PORT
Store 1				. . .	
Store 2				. . .	
Store 3D_1				. . .	
Store 3D_2				. . .	
Print				. . .	
Worklist				. . .	
Structured Reporting				. . .	
Storage Commit				. . .	
MPPS				. . .	

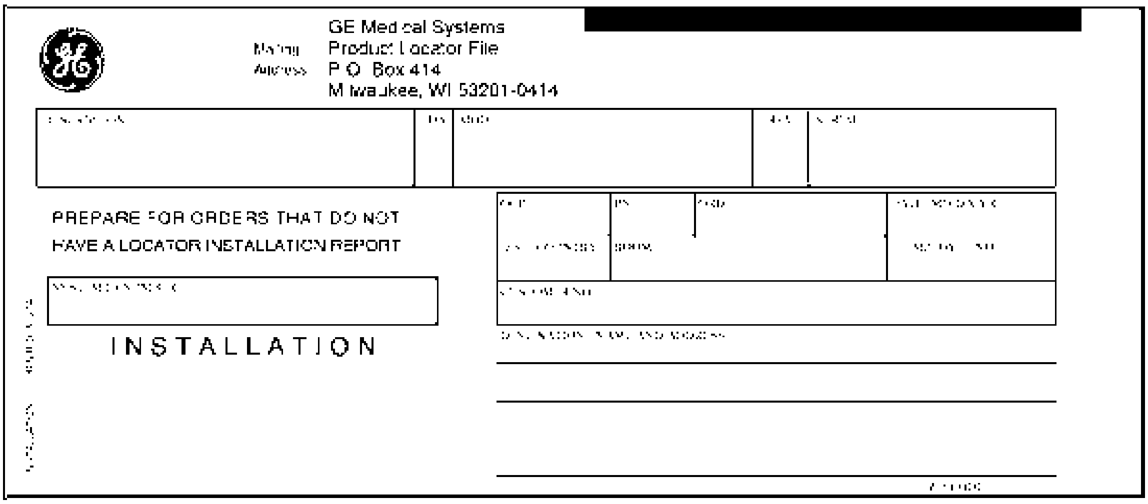
Figure 3-51 Worksheet for DICOM Network Information

Section 3-14
Paperwork

NOTE: During and after installation, the documentation (i.e. User Manual, Installation Manual,...) for the peripheral units must be kept as part of the original system documentation. This will ensure that all relevant safety and user information is available during the operation and service of the complete system.

3-14-1 Product Locator Installation

NOTE: The Product Locator Installation Card shown may not be same as the provided Product Locator card.



GE Medical Systems
Mailing Address Product Locator File
P.O. Box 414
Milwaukee, WI 53201-0414

PREPARE FOR ORDERS THAT DO NOT HAVE A LOCATOR INSTALLATION REPORT

INSTALLATION

Figure 3-52 Product Locator Installation Card

3-14-2 User Manual(s)

Check that the correct User Manual(s) for the system and software revision, is included with the installation. Specific language versions of the User Manual may also be available.
Check with your GE Sales Representative for availability.

Chapter 4
Functional Checks

Section 4-1
Overview

4-1-1 Purpose of Chapter 4

This chapter provides procedures for quickly checking major functions of the Voluson® S8 / Voluson® S6 scanner diagnostics by using the built-in service software, and power supply adjustments.

Table 4-1 Contents in Chapter 4

NOTICE Most of the information pertaining to this Functional Checks chapter is found in the Voluson® S8 / Voluson® S6 Basic User Manual; see: Table 9-10, “System Manuals - Voluson® S8 / Voluson® S6,” on page 9-16.

Section 4-2
Required Equipment

- An empty (blank) DVD/CD+R/RW and/or external USB device (stick or hard disk drive).
- At least one transducer. See *Chapter 9 - Probes, on page 9-17* for an overview.
  (normally you should check all the transducers used on the system)

Section 4-3
General Procedure

CAUTION **SYSTEM REQUIRES ALL COVERS**
Operate this unit only when all board covers and frame panels are securely in place.
The covers are required for safe operation, good system performance and cooling purposes.

NOTICE Lockout/Tagout Requirements (For USA only)

Follow OSHA Lockout/Tagout requirements by ensuring you are in total control of the Power Cable on the system.

4-3-1 Power On / Boot Up

NOTICE After turning off a system, wait at least 10 seconds before turning it on again.
The system may not be able to boot if power is recycled too quickly.

4-3-1-1 Scanner Power On

1.) Connect the Main Power Cable to the back of the system.
2.) If not already done, screw on the pull-out protection of the mains power cable with the 2 screws.
3.) Connect the Main Power Cable to a hospital grade power outlet with the proper rated voltage. Never use an adapter that would defeat the safety ground.
4.) Switch ON the Circuit Breaker at the rear of the system.

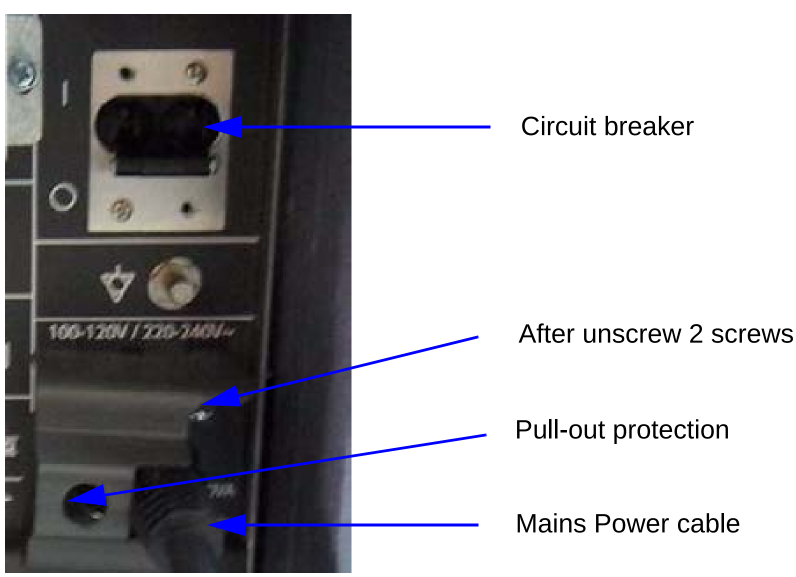


Figure 4-1 Circuit Breaker, pull-out protection and main power cable at rear of system

NOTICE When AC power is applied to the scanner, the **ON/OFF** button on the control panel illuminates amber, indicating that the System (including the Back-end Processor) is in *Standby* mode.

4-3-1-1 Scanner Power On (cont'd)

5.) Hold down the **On/Off** button (see: Figure 4-2) on the control panel for ~3 seconds.

*NOTE: The power for on-board peripheral auxiliary equipments are commonly switched with the **ON/OFF** button. The power switch of any attached printer(s) needs to be in ON position before starting the system. However, be aware some auxiliary equipment may switch itself to standby mode (e.g., Color video printer) and must therefore be switched on separately.*

Figure 4-2 On/Off Button on Control Panel

As soon as the software has been loaded, the system enters 2D-Mode with the probe and application that were used before the system was shut down. Total time used for start-up is about 2 minutes.

*NOTE: The power for on-board peripheral auxiliary equipments are commonly switched with the **ON/OFF** button. So the auxiliary equipment need not to be switched ON/OFF separately.*

4-3-2 Power Off / Shutdown

NOTICE After turning off a system, wait at least 10 seconds before turning it on again. The system may not be able to boot if power is recycled too quickly.

4-3-2-1 Scanner Shutdown

1.) If not already in read mode, freeze the image.
2.) Press the **ON/OFF** button (see: Figure 4-2) on the control panel. Following dialog appears.

Figure 4-3 Shutdown, Restart or Cancel

3.) Select the SHUTDOWN button. The system performs an automatic full shutdown sequence.

NOTE: Full shut down is also performed when pressing the ON/OFF button on the control panel twice.

4.) Switch OFF the Circuit Breaker at the rear of the system.

*NOTE: The mains outlet of the system for peripheral auxiliary equipment are commonly switched with the **ON/OFF** button. So the auxiliary equipment need not to be switched ON/OFF separately.*

WARNING ***Disconnection of the Main Power Cable is necessary! For Example: When repairing the system.***

5.) After complete power down, unscrew the 2 screws and remove the pull-out protection to disconnect the main power cable from the system or unplug it from the AC wall outlet socket.

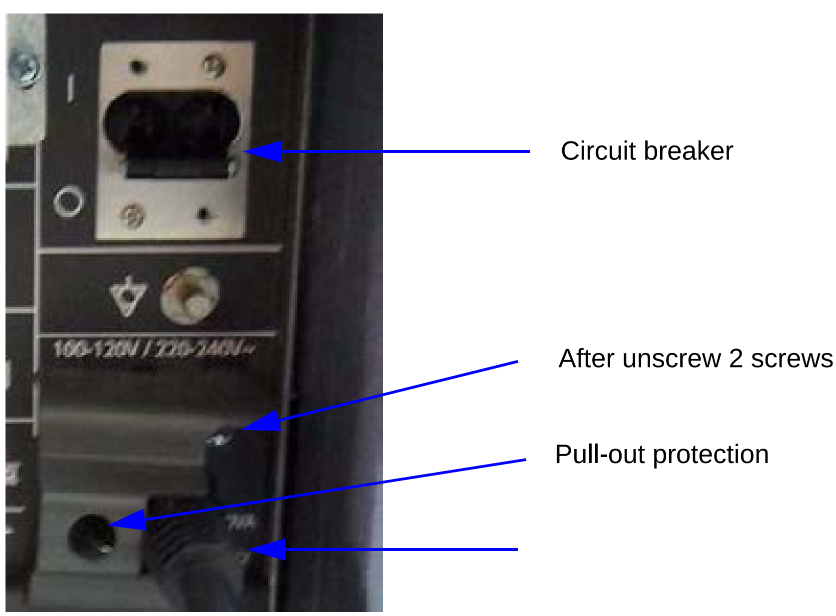


Figure 4-4 Circuit Breaker, pull-out protection and main power cable at rear of system

6.) Press on the brakes to block the front caster wheels.

7.) Disconnect probes.

CAUTION **DO NOT disconnect a probe while running (Live Scan “Write” mode)!
A software error may occur. In this case switch the unit OFF (perform a reset).**

4-3-3 System Features

4-3-3-1 Control Panel

Figure 4-5 Control Panel Tour

1	Loudspeaker position	**9**	Hard keys
2	TGC Slider controls	**10**	Trackball button
3	Menu window digipot controls	**11**	Probeholders
4	Menu window flipswitch controls		
5	Mode keys(digipot controls)		
6	Toggle switch controls		
7	Trackball		
8	Alphanumeric Keyboard		

4-3-3-2 Monitor Display

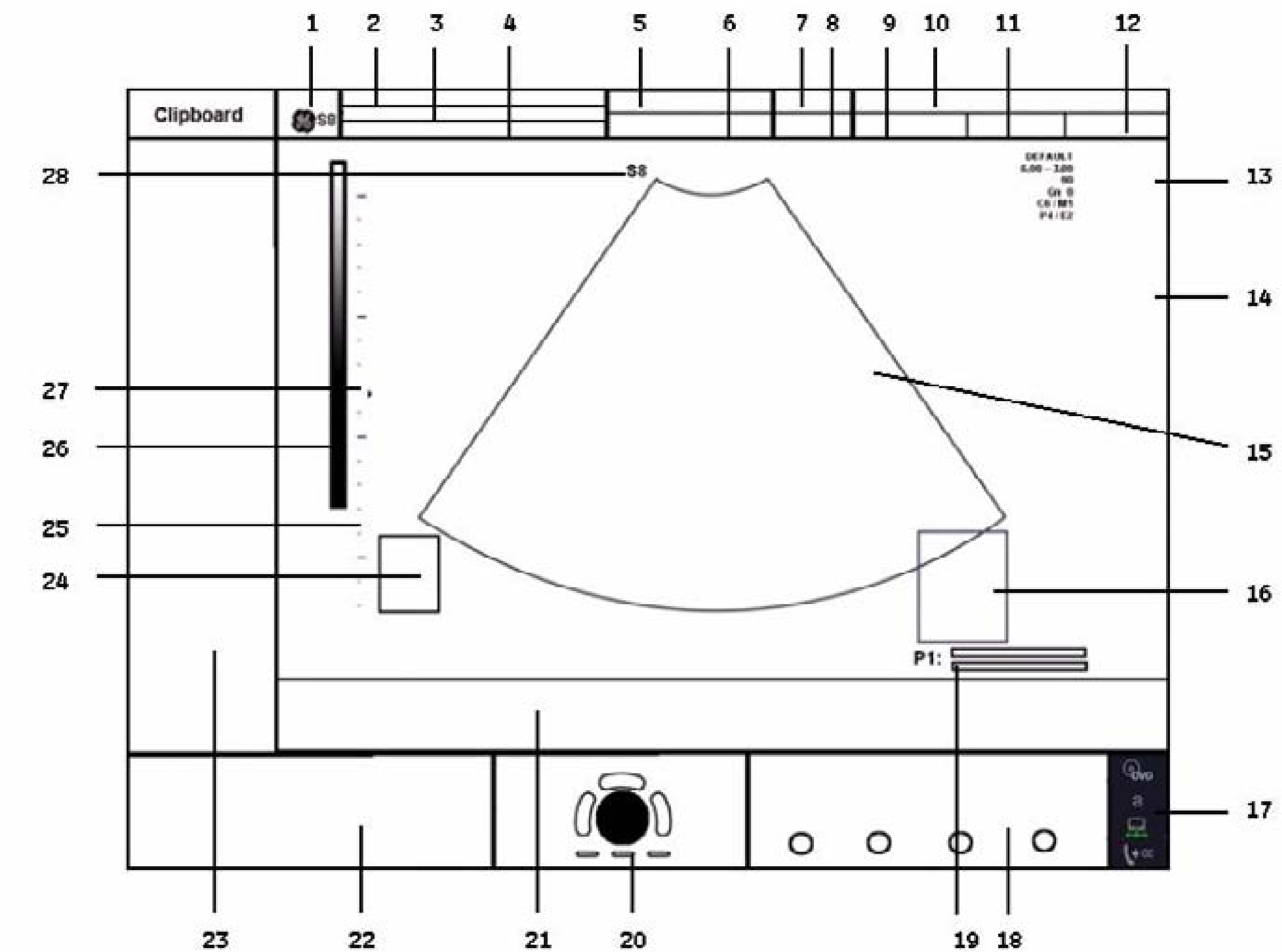


Figure 4-6 Monitor Display Tour

Table 4-2 Monitor Display Features

1. Logo	15. Image area
2. Patient Name (Last-, First-, Middle Name)	16. Measurement results
3. Patient ID-number ; GA (Gestational Age)	17. Status bar area
4. 2nd Patient ID-number	18. P buttons
5. Probe / Application	19. Cine
6. Depth / Frame rate	20. TrackballCine
7. Mechanical Index	21. Current Clipboard
8. Thermal Index	22. Rotary button and Paddle Key
9. Sonographers Name	23. On Screen Menu
10. Hospital Name (Identification)	24. Body marker
11. Date	25. Depth scale markers
12. Time	26. Gray scale wedge
13. Image Info	27. Focal zones marker
14. TGC curve	28. Orientation marker

Section 4-4
Functional Checks

For a basic functional check of the system's different modes, following pages will familiarize you with image optimization for:

- 2D Mode (B Mode), see: Section 4-4-1 on page 4-9
- Additional (optional) Operating Modes, see: Section 4-4-2 on page 4-13
    - XTD-View
    - Coded Contrast Imaging
- M Mode, see: Section 4-4-3 on page 4-15
    - MCFM Mode
- Spectral Doppler Modes, see: Section 4-4-4 on page 4-17
    - PW - Pulsed Wave Doppler
    - CW - Continuous Wave Doppler
- Color Doppler Modes, see: Section 4-4-5 on page 4-19
    - CFM - Color Flow Mode
    - PD - Power Doppler
    - TD - Tissue Doppler
    - HD-Flow - Bi-Directional Angio
- Volume Modes, see: Section 4-4-6 on page 4-21
    - 3D Static
    - 4D Real Time
    - 4D Biopsy
    - VCI - Volume Contrast Imaging (A-Plane, C-Plane and VCI Static)
    - STIC
    - T.U.I. (Tomographic Ultrasound Imaging)
    - VOCAL II

*NOTE: Some software may be considered standard depending upon system configuration.
If any Modes or Options are not part of the system configuration, the check can be omitted.*

*NOTE: Different menus are displayed depending on which Mode is selected.
Some function keys only appear if they are available for the selected probe.*

4-4-1 2D Mode Checks

Figure 4-7 2D Main and 2D Sub Menu

Table 4-3 2D Mode Functions

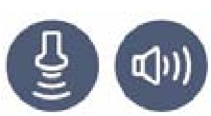
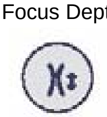
Step	Task	Expected Results
1	2D Mode Gain	Rotate the **2D MODE** key to adjust the sensitivity (brightness) of the entire image.
2	Transmit Power &  Acoustic Output of speakers	Transmit Power: Optimizes image quality and allows user to reduce beam intensity. push/dial Toggle control Acoustic Output: Adjustment of the Audio level of the speakers.
3	Focus Depth 	To select the depth position of the actual focus zone(s). Arrows at the left edge of the 2D-Image mark the active focal zone(s) by their depth position.

Table 4-3 2D Mode Functions

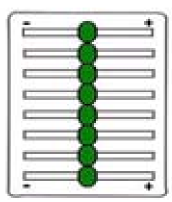
Step	Task	Expected Results
4	Depth 	Adjusts the penetration depth range of the ultrasound image for the region of interest. The number of image lines and the frame rate are automatically optimized.
5	Multi Format (Dual, Quad) 	Press this keys to change the display Mode from Single to **DUAL** or **QUAD** display mode. Press the **SINGLE** format key or the **2D MODE** key to change from Dual or Quad to Single display.
6	2D Automatic Optimization 	Pressing the **AUTO** key causes automatic optimization of the gray scale to enhance the contrast resolution. Pressing again: optimization will be updated and remain active. Press the **AUTO** key twice to switch off the Automatic Optimization in 2D.
7	Harmonic Imaging 	Press the **HI** key on the control panel to switch on/off the Coded Harmonic Imaging function in 2D Mode provided the active probe allows this function.
8	**TGC**Slider Control 	The °×TGC slide controls°± vary the gain in certain depths of the 2D image to allow an exact compensation for the attenuation of the echoes over time (depth). TGC slide controls to selectively adjust the gain (brightness) in depth. Slide a slide control to the left to decrease the gain in the corresponding specific 2D depth. Slide a slide control to the right to increase the gain in the corresponding specific 2D depth.
9	**FFC** (Focus and Frequency Composite)	FFC combines a low frequency to increase the penetration and higher frequency to keep a high resolution. It reduces speckle and artifacts in the 2D image.
10	**XBEAM CRI** (CrossBeam Compound Resolution Imaging)	Pulses are transmitted not only perpendicularly to the acoustic window, but also in oblique directions. The advantages of XBeam CRI are enhanced contrast resolution with better tissue differentiation and clear organ borders.
11	**CE** (Coded Excitation)	Coded Excitation improves image resolution and penetration in the far field. This allows to use a higher frequency on technically difficult patients.
12	**SRI** (Speckle Reduction Imaging)	Speckle Reduction Imaging is a smoothing type filter to reduce speckle in the ultrasound image.
13	Receiver Frequency Range 	The “Frequency range” function allows for the fast adjustment of high resolution/lower penetration, mid resolution/mid penetration, or lower resolution/ high penetration for the 2D image. From the transducer’s broadband signal a certain start frequency and start bandwidth is extracted and then continuously changed over depth. Every transducer has a set of three fixed receive settings which are easily controlled by switching the [Frequency] key.
14	**TRAPEZ**	Advantage of the Trapezoid Mode (button is highlighted): The scan area is very increased in relation to the linear display by steering the ultrasound lines in the border of the probe.
15	Image Orientation	Use the **LEFT/RIGHT** respectively the **UP/DOWN** keys on the Touch Panel to alternate the image orientation.

Table 4-3 2D Mode Functions

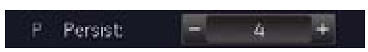
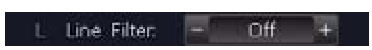
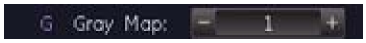
Step	Task	Expected Results
16	**ANGLE**	Use this control to select a part of interest of the 2D image. The advantage of the decreased field-of-view is an increased 2D frame rate due to the smaller sector width.
17	**ß-VIEW**	This function allows the adjustment of the Volume O-Axis position of 3D probes in 2D Mode. The green line in the displayed symbol indicates the position of the acoustic block.
18	**OTI** (Otimized Tissue Imaging)	OTI™ allows to “fine tune” the system for scanning different kinds of tissue.
19	**CINE** Mode 	While scanning a certain number of frames (2D images of the last examination sequence), this will be stored in the cine memory automatically. This is indicated by the green bar in the bottom left corner:  When entering freeze mode, by pressing the [Freeze] key or the defined [Px] key, the cine memory will be stored as a sequence. This sequence can be reviewed in loop mode or image by image. After the cine clip is stored the cine memory will be deleted.
20	**PERSIST**. 	Persistence is a temporal filter that averages frames together. This has the effect of presenting a smoother, softer image. This function is only available if **XBEAM CRI** is switched off.
21	**LINE FILTER** 	The signals of the neighboring pulses are less weighted for the display of the actual pulse which considerably improves the detail lateral resolution and signal-to-noise ratio. This function is only available if **XBEAM CRI** is switched off.
22	**CRI FILTER** 	If this filter is set to “high”, the XBeam CRI-image is smoothed. CRI Filter setting “off” leads to a sharper impression of the XBeam CRI-image. This function is only available if **XBEAM CRI** is switched on.
23	**DYNAMIC CONTROL** 	“Dynamic Control” allows you to enhance a part of interest of the grayscale to make it easier to display pathology. You can select between twelve different Dynamic control curves. The dynamic control is displayed in the Image Info area on the screen. Dynamic Control: 1 to 12
24	**LINE DENSITY** 	Control to improve the resolution by reducing the frame rate. Respectively reducing the resolution by increasing the image frame rate. **high:** higher resolution / lower frame rate **norm:** normal resolution / medium frame rate **low:** lower resolution / higher frame rate
25	**ENHANCE** 	Edge Enhance brings out subtle tissue differences and boundaries by enhancing the gray scale differences corresponding to the edges of structures.
26	**REJECT**	Selects a level below which echoes will not be amplified (an echo must have a certain minimum amplitude before it will be processed).

Table 4-3 2D Mode Functions

Step	Task	Expected Results
27	GRAY MAP 	A gray map determines the displayed Brightness of an echo in relationship to its amplitude.
28	TINT MAP 	A Tint map determines the Chroma value (color tone and saturation) of an echo in relationship to its amplitude.

For further details refer to the Voluson® S8 / Voluson® S6 Basic User Manual, Chapter 6, 2D Mode.

4-4-2 Additional (optional) Operating Modes

4-4-2-1 B-Flow

B-Flow On/Off switch
Press the **BF** control to activate/deactivate the B-Flow mode.
The “B-Flow Main” menu appears on the menu area (scan mode).
B-Flow is an option. If the option is not installed, the **BF** control is not active.

For further details refer to the Voluson® S8 / Voluson® S6 Basic User Manual, Chapter 6.6

4-4-2-2 XTD-View Check

XTD-View On/Off switch
Press the **XTD** key to activate/deactivate the XTD-View mode.
A blue box is displayed at the border of the 2D image.
Start and Stop the XTD-image acquisition with the **right trackball key**.

Figure 4-8 XTD-View Main Menu

For further details refer to the Voluson® S8 / Voluson® S6 Basic User Manual, Chapter 6.7.

4-4-2 Additional (optional) Operating Modes (cont'd)

4-4-2-3 Coded Contrast Imaging Check

Coded Contrast Imaging On/Off switch

Press the **CONTRAST** key to activate/deactivate the Coded Contrast Imaging mode.

Figure 4-9 Contrast Main and Contrast Sub Menu

For further details refer to the Voluson® S8 / Voluson® S6 Basic User Manual, Chapter 6.8.

4-4-3 M Mode Checks

NOTE: The AMM menu is only displayed if the Anatomical M-Mode option is installed.

Figure 4-10 M Main and M Sub Menu

Table 4-4 M Mode Functions

Step	Task	Expected Results
1	Cursor Position	Adjust the M Cursor position with the **TRACKBALL** in the 2D Single image.
2	Activation of M Mode	Press the **right or left trackball key** to activate both Modes (2D/M).
3	M Mode Gain	Rotate the **M MODE** key to adjust the sensitivity (brightness) of the entire M image.
4	**SPEED**	By adjusting + or -, four different sweep speeds can be selected.
5	**INVERT**	Invert of the M Mode image. (Function is only available with endovaginal probes.)
6	**FREQUENCY** resp.	Common with 2D Mode Receiver Frequency Range.
7	TGC Slider Controls	Common with 2D Mode TGC Slider Controls
8	Transmit Power	Common with 2D Mode Transmit Power
9	M Mode Depth	Common with 2D Mode Depth.
10	M Cineloop	Common with 2D Mode CINE Mode
11	REJECT	It determines the amplitude-level below which echoes are suppressed (rejected).

Table 4-4 M Mode Functions

Step	Task	Expected Results
12	ENHANCE	Due to this function a finer, sharper impression of the image is produced.
13	DYNAMIC CONTROL.	Dynamic Range enhances a part of the grayscale to make it easier to display pathology.
14	DISPLAY FORMAT	For selection of different rations of display format.
15	Gray Map	Common with 2D Mode Gray Map
16	UTILITIES	After pressing **[Utilities]**, the menu area changes to the “Utilities” menu.

For further details refer to the Voluson® S8 / Voluson® S6 Basic User Manual, Chapter 7, M Mode.

4-4-3-1 MCFM Mode Check

By pressing the M control and the C control, the MCFM mode is switched on in the preparation mode. The M-cursor with M-Color window appears on the active 2D image.

Figure 4-11 MCFM Main and MCFM Sub Menu

For further details refer to the Voluson® S8 / Voluson® S6 Basic User Manual, Chapter 7.4.

4-4-4 Spectral Doppler Mode Checks

NOTE: Different menus are displayed depending on which Spectral Doppler Mode (PW or CW) is selected.

NOTE: The Continuous Wave Doppler Mode is an Option. The CW key is only illuminated if the option is installed and the selected probe is capable for the Continuous Wave Doppler Mode.

Figure 4-12 Spectral Doppler Mode (PW or CW) Functional menu

Table 4-5 Spectral Doppler Mode (PW or CW) Functions

Step	Task	Expected Results
1	Gate Position and Gate WIDTH	Adjust the Gate- Position resp. Size with the **TRACKBALL** in the 2DSingle image. The **upper trackball key** changes from Gate position to Gate size.
2	Activation of PW Mode	Press the **right trackball key** to activate the motion display. Press the **left trackball key** to activate both Modes (B/D).
3	PW Gain Control	Rotate the **PW MODE** key to adjust the amplification of the entire spectrum.
4	PW Automatic Optimization	Pressing the **AUTO** key enables automatic optimization of the PRF and Baseline
5	FREEZE	The steering function is only available with linear probes.
6	SPEED	By adjusting + or -, four different sweep speeds can be selected.
7	AUDIO SIGNAL	
8	RT TRACE (Real Time Auto-Trace)	The envelope curve of the Doppler spectrum (maximum velocities) and the corresponding evaluations are automatically displayed on the monitor.
9	Display Format	Doppler spectrum is displayed below the B mode image or on its right side.
10	INVERT	To invert the Doppler spectrum display in relation to the direction of the flow.
11	**ANGLE**	The angle cursor can be turned in both directions without stop. By pressing the angle knob repeatedly the angle correction switches from +60° to 0° and to -60°.
12	**BASELINE**	Adjusting the baseline is possible in read- and write Mode (up/down in 8 steps).

Table 4-5 Spectral Doppler Mode (PW or CW) Functions

Step	Task	Expected Results
13	**WMF** (Wall Motion Filter)	Used to eliminate Doppler “noise” that is caused by vessel wall motion.
14	**PRF**	The Velocity Range display is governed by the pulse repetition frequency (PRF) Exceeding the maximum PRF, the HPRF-Mode is automatically switched on.
15	DYN. CONTR.	Dynamic Range adjusts the display cutoff of the Doppler analysis waveform.
16	CENTER FREQUENCY	It serves for selection of the required transmit frequency.
17	SCALE UNIT	To select the displayed measuring unit (in relation to the zero-line).
18	DISPLAY FORMAT	For selection of different rations of display format.

For further details refer to the Basic User Manual, Chapter 8, Doppler Mode.

4-4-5 Color Doppler Mode Checks

NOTE: *Different menus are displayed depending on which Color Doppler Mode (CFM, PD, HD-FLow or TD) is selected.*

NOTE: *After pressing the* ***PD*** *key on the control panel, the* *HD-FLOW* *menu (to activate the Bi-Directional Angio Mode) can be seen.*

Figure 4-13 CFM Main and CFM Sub Menu

Table 4-6 Color Doppler Mode (CFM, PD, HD-Flow, TD) Functions

Step	Task	Expected Results
1	Color Box Position and Color Box Size	Adjust the Box- Position resp. Size with the **TRACKBALL** in the 2DSingle image. The **upper trackball key** changes from Box position to Box size.
2	CFM Gain PD Gain HD-Flow Gain TD Gain	Rotate the **C MODE** key to ensure that continuous flow is displayed, where appropriate. Rotate the **PD MODE** key to adjust the Power Doppler Gain Rotate the **PD MODE** key to adjust the Bi-Directional Angio Gain Rotate the **C MODE** key to adjust the Tissue Doppler Gain.
3	STEERING	Beam Steering is only possible with linear probes in CFM, PD and HD-Flow Mode.
4	2D+2D/C (PD, HD-Flow or TD)	Changes the Single image display to two simultaneous half images. The left frame shows only the 2D Mode image. The right frame shows the 2D Mode image with color information.
5	INVERT	The color of the color wedge inverts around the baseline. (impossible in PD Mode)
6	**ZOOM**	Image magnification (PAN-Zoom) in read- and write mode.
7	**QUALITY**	Improves the Color Resolution by reducing the image frame rate, respectively vice versa.

Table 4-6 Color Doppler Mode (CFM, PD, HD-Flow, TD) Functions

Step	Task	Expected Results
8	**WMF** (Wall Motion Filter)	Used to eliminate Doppler “noise” that is caused by vessel wall or cardiac wall motion. (CFM,PD, HD-Flow)
9	**PRF**	By adjusting toward up the PRF increases. By adjusting toward the PRF decreases.
10	**THRESHOLD**	After **FREEZE** you can adjust the Color Threshold. It eliminates small color noise or motion artifact signals in the color image. (small number cuts off less signals than a higher setting)
11	DISPL. MODE	To select the CFM- Display Mode (V; V-T; V-Pow; Pow-T; or T).
12	SMOOTH	To select different filter periods for rising velocity and falling velocity. RISE Filtering of the rise velocity leads to noise suppression. FALL This filter leads for “prolongation” of the display flow.
13	FREQU.	It serves for selection of the Transmit Frequency which also depends on the Color Box position.
14	ENSEMBLE	Controls the number of pulses to constitute one Color-, Power-Doppler or HD-Flow line in the display.
15	FLOW RES.	This function controls the axial resolution of color in the display. It adjusts the axial sample depth of color pixels.
16	LINE DENS	Determines the line density within the Color-Box. The lower the line density, the larger the line distance and the size of the color pixels.
17	SCALE (CFM, HD-Flow, TD)	The maximum velocities are displayed above and under the color scale in kHz, cm/s or m/s.
18	CFM-MAP (PD, HD-Flow, TD)	Provides selectability of the color coding for an optimization of the display of blood flow (similar to the post-processing curves with grayscale 2D scans). After a selection has been made, the color bar displays the resultant map.
19	GENTLY COLOR	Gently means the transition between color and gray scale information. The embedding of the color into 2D Mode is performed smoothly with less colored splashes. To activate the “Gently Color” function, select the CFM MAP (PD, HD-Flow, TD) key in the menu.
20	BALANCE	The Balance controls the amount of Color display over bright echoes and helps to confine color within the vessel walls.
21	ARTEFACT (on/off)	Switch on/off the artifact suppression.
22	BASELINE	The baseline shift can be used to prevent aliasing in one flow direction similar to the Doppler baseline shift. (Impossible in PD Mode.)
23	LINE F.	With “Line Filter” the signals of the neighboring pulses are less weighted for the display of the actual pulse which considerably improves the detail lateral resolution and signal-to-noise ratio.

For further details refer to the Voluson® S8 / Voluson® S6, Basic User Manual:

- Chapter 8, CFM Mode (Color Flow Mode)
- Chapter 8, PD Mode (Power Doppler Mode)
- Chapter 8, HD-Flow Mode (Bi-Directional Angio Mode)
- Chapter 8, TD Mode (Tissue Doppler Mode)

4-4-6 Volume Mode Checks

NOTICE 4D Real Time 4D, STIC, VCI, VCI Omni View, TUI, VOCAL II, SonoVCAD Heart, SonoVCAD labor and SonoAVC are Options. If options are not part of the system configuration, checks can be omitted.

NOTE: Different menus are displayed depending on which Menu and which Volume Mode is selected(4D Real Time or 3D Static) is selected.

NOTE: Some function keys only appear on the meun area if they are available for the selected Probe.

4-4-6-1 Pre-Volume Mode Functions

1. select the desired Volume Mode:

or

The Volume Mode function is switched on, the “3D Pre” respectively “4D Pre” menu appears on the screen (write mode) and the volume box

2. if possible, select the desired Acquisition Mode

3. Select User Setting

4. select the desired Visualization Mode

5. Start the Volume Acquisition with the Freeze key resp. the right trackball key.

Figure 4-14 Pre-Volume Mode menus (e.g., 4D Real Time)

Table 4-7 Pre-Volume Mode Functions

Step	Task	Expected Results
1	**AQUISITION:**	
	• 3D STATIC	3D Volume Mode - Static volume acquisition (also in combination with PD, HD-Flow or CFM)

Table 4-7 Pre-Volume Mode Functions

Step	Task	Expected Results
	• 4D REAL TIME	Real Time 4D - continuous volume acquisition and parallel calculation of 3D rendered images
	• VCI A	Volume Contrast Imaging - improves the contrast resolution and the signal / noise ratio and therefore facilitates finding of diffuse lesions in organs
	• VCI OMNI VIEW	Volume Contrast Imaging Omni View (any plane) - improves the contrast resolution and the signal / noise ratio and therefore facilitates finding of diffuse lesions in organs. Volumes can be edited in all other Visualization Modes.
	• STIC	The fetal heart or an artery can be visualized in 4D (also in combination with PD, HD-Flow or CFM)
	• 4D BIOPSY	Real Time 4D Biopsy - continuous volume acquisition + parallel calculation of 3D rendered images
1	**QUALITY**	Changes the line density against the acquisition speed (low, mid1, mid2, high1, high2).
2	**VOL. ANGLE**	To select the Volume Sweep Angle.
3		- Quarter size display of Sectional planes without 3D image **or** - Quarter size display of Sectional planes + rendered 3D image (Note: The display depends on selected Acquisition- and Visualization Mode!)
4		Dual size display of Sectional Planes + rendered 3D image. (Note: The display depends on selected Acquisition- and Visualization Mode! This format is not possible for Static 3D Acquisition)
5		- Full size display of a the reference image **or** - Full size display of the rendered 3D image. (Note: The display depends on selected Acquisition- and Visualization Mode!)
6	Volume Box Position and Volume Box Size	Adjust the Volume Box (ROI) Position resp. Size with the **TRACKBALL** in the 2D Single image. The **upper trackball key** to change the Trackball function from Box Position to Box Size.
7	Start Acquisition	Press the **FREEZE** key resp. the **right trackball key** to start the Volume acquisition.
8	**VISUALIZATION:**	After resp. during Volume Mode Acquisition:
	• RENDER	After the 3D acquisition the system switches automatically to the read menu. The selected format will be present on the monitor (e.g., 3D ROI Mode: sectional planes A, B, C + rendered 3D image).
	• SECTIONAL PLANES	After the 3D Sectional Planes acquisition the system switches automatically to the read menu. The selected format will be present on the monitor (e.g., A,B,C - Sectional Plane mode).
	• TUI	This method of visualization is consistent with the way other medical systems such as CT or MRI, present the data to the user (slices through the data set, which are parallel to each other).
	• VOLUME ANALYSIS	The basic idea behind “VOCAL” is the combination of 3D ultrasound tissue (presented as voxels) and the geometric information of surfaces in a 3D data set. After definition of contour in 3D space (semi-automatically, manually or spherical) a wide range of functionality is given.
	• SONOVCAD HEART	Technology that automatically generates a number of views of the fetal heart. At this time it can help to find the right and left outflow tract of the heart and the fetal stomach.
	• SONOVCAD LABOR	Allows to measure fetal progression during the second stage of labor – fetal head progression, rotation and direction. Visual evidence and objective data of the labor process are provided.
	• SONOAVC GENERAL	This Feature can automatically detect low echogenic objects (e.g., follicles) in a volume of an organ (e.g., ovary) and analyze their shape and volume.
	• NICHE	Parts of the orthogonal sections A, B and C are compiled to a 3D-section aspect. The name “Niche” has been chosen because the aspect shows a quasi spatial cut into the reference image.

4-4-6-2 Functions after the Acquisition

Figure 4-15 Sectional Planes and Image Rendering

Table 4-8 Functions after the 3D Acquisition

Step	Task	Expected Results
1		PW MODE rotary control: Rotation about X-axis of the reference image. M MODE rotary control: Rotation about the Y-axis of the reference image. PD MODE rotary control: Rotation about the Z-axis of the reference image.
2		C MODE rotary control: Movement along Z-axis of the reference image. TRACKBALL: Movement along X- and Y-axis of the reference image.
3	NICHE	Parts of the orthogonal sections A, B and C are compiled to a 3D-section aspect. The aspect shows a quasi spatial cut into the reference image.
4	REF. IMAGE	To select the Reference image among A, B, C or 3D.
5	INIT	Resets rotations and translations of a volume section to the initial (start) position.
6	3D INIT	Resets the 3D image to the initial (start) position.

Table 4-8 Functions after the 3D Acquisition

Step	Task	Expected Results
7	SRI / SRI 3D	Speckle Reduction Imaging (SRI) to reduce speckle which interferes with the sectional planes or rendered 3D image.
8	**ZOOM**	The 3D image as well as the sectional planes can be varied by their aspect ratio.
9	**MIX**	To adjust the mix ratio between two calculated modes.
10	**TH. LOW**	All color values below the level will be disregarded for calculation of the surface.
11	MAGI CUT	Ability to electronically manipulate the images and cut way “3D artifacts”.
12	RENDER MODE	To select the Render Mode (Image Type and Render Algorithm)

4-4-6-3 3D/4D Sub Menu

Figure 4-16 3D/4D Sub Menu

Table 4-9 Sub Menus

Step	Task	Expected Results
1	PROBE ORIENTATION	Adjust and activate the display of direction markers at border of the image.
2	GRAY/TINT MAPS	Depending on individual requirements a “harder” or “softer” image can be obtained.
3	RENDER VIEW DIRECTION	To select the desired Render View Direction. The green line symbolizes the direction of the view. Note: The Render View Direction keys are not available in Static 3D Sectional Planes.
4	3D/4D INFO	On/Off switch to show full or reduced Image Info parameter on screen.
5	3D COLOR OFF	On/Off switch to show an acquired 3D+CFM, 3D+PD or 3D+HD-Flow image with or without the color information.
6	GRAY 3D	Adjusts the contrast and brightness of the rendered 3D image.
7	**BACKGROUND**	Adjusts the contrast of the screen background from dark to bright. Note: This key is not available in Static 3D Sectional Planes mode.
8	**BALANCE**	Only available if a 3D+CFM, a 3D+PD or a 3D+HD-Flow image is acquired. Note: Only available if a 3D+CFM, a 3D+PD or a 3D+HD-Flow image is acquired.

Table 4-9 Sub Menus

Step	Task	Expected Results
9	**POWER TRESH.**	This function eliminates low color noise of motion artefact signals in the sectional slices as well as in the rendered 3D image. Note: Only available if a 3D+CFM, a 3D+PD or a 3D+HD-Flow image is acquired.

For further details refer to the Voluson® S8 / Voluson® S6 Basic User Manual, Chapter 9.

4-4-7 Using Cine

4-4-7-1 Activating Cine

Press **FREEZE**, then roll the **TRACKBALL** to display the images of the stored sequence one by one.

4-4-7-2 Cine-Split Function (Multiple Format)

After **FREEZE** of a sequence in 2D Mode two or four different images of the sequence can be displayed simultaneously in Dual respectively Quad Display Mode.

Move the **TRACKBALL** to display the images of the stored sequence. Use the **FORMAT** keys to change to the next (part of) frozen 2D image sequence to play back the cine memory.

NOTE: The Cine-Split function (multiple format) is also possible in 2D Cine mode.

4-4-7-3 Activating 2D Cine

1.) After Freeze, select the CINE MENU on the menu area.
2.) Select the **START** of the sequence.The selected image is simultaneously displayed.
3.) Turn the **END** digipot to the end of the sequence. The selected image is displayed.
4.) Select the review **SPEED** and the read **ZOOM** factor.
5.) Select the Cine Mode review direction.
6.) To start/stop the Cine Loop playback select 2D CINE START/STOP.

After stopping the sequence, move the **TRACKBALL** to display the images one by one.

4-4-7-4 Spectral Doppler- or M Cine Loop

Press **FREEZE**, then roll the **TRACKBALL** to display the Cine / Loop one by one.

The **UPPER TRACKBALL KEY** changes from the 2D Cine to the D Loop (respectively M Loop).

*NOTE: The active Cine is displayed on the monitor screen: **2D**/D(M)-image or 2D/**D(M)-image.***

4-4-7-5 Activating 3D Rotation Cine

1.) After 3D Volume acquisition the 3D ROT. CINE key on the Touch Panel.
2.) Select the Rotation angle with the select keys or select it manually with the **START IMAGE** and **END IMAGE** rotary controls.
3.) Select the Step angle and the Rotation axis.
4.) Select the CALCULATE CINE SEQUENCE key to start the calculation.
5.) To start/stop the 3D Rotation Cine sequence select START/STOP.

4-4-7-6 Activating Volume Cine

1.) After Real Time 4D acquisition move the **TRACKBALL** horizontally to display the Volumes of the stored sequence one by one. (Alternative use the **VOL CINE #** control to select the desired volume.) For further details refer to the Voluson® S8 / Voluson® S6 Basic User Manual, Chapter 11.6.

4-4-7-7 Activating Auto Cine

1.) After Real Time 4D acquisition select the CINE key on the menu area.
2.) Select the **START VOLUME** and the **END VOLUME** of the sequence with the rotary controls.
3.) Select the Cine Mode direction and the review **SPEED**.
4.) To start/stop the Cine sequence select the START/STOP key.

*NOTE: After stopping a sequence, move the **TRACKBALL** to display the images / volumes one by one.*

4-4-7-8 Activating Cine Calc

1.) After 3D Volume or Real Time 4D acquisition select the CINE CALC key on the .
2.) Choose desired Cine Calc display mode.
3.) Select Step Size and Reference image.
4.) Select the **START IMAGE** and the **END IMAGE** of the sequence with the rotary controls.
5.) Select the CALCULATE CINE SEQUENCE key to start the calculation.
6.) To start/stop the calculated Cine sequence select START/STOP.

4-4-8 Generic Measurements

NOTE: Different menus are displayed depending on:
• the currently selected Application and Display Mode,
• the selected “Study”,
• and the settings in the Measure Setup - **MEASURE & CALC** *page.*

For further details refer to the Voluson® S8 / Voluson® S6 Basic User Manual, Chapter 13.

General remarks to perform Generic Measurements:

- By pressing the **CALIPER** key on the control panel the Generic Measurement function is switched on.
- Positioning of measurement marks is done with the **TRACKBALL**.
- Entering and storage of measuring marks is done with **SET** (right or left trackball key).
- To change measuring marks before completion press **CHANGE** (upper trackball key).
- Depending on the setting in the Measure Setup, also the **FREEZE** key can be used for confirming the last measuring mark of the currently performed measurement.
- The status bar area shows the current function of the trackball.
- To cancel the measurement of the currently selected item, select CANCEL on the menu area.
- To delete all measurement results of the selected “Study” from the monitor as well as from the corresponding Worksheet, select the CLEAR STUDY key on the menu area.
- All measurement results will be automatically included in the “Generic” patient worksheet.
- To erase measurement results from the screen, press the **CLEAR** key on the control panel or press the **DEL** key on the keyboard.
- To exit from Generic measurements select the EXIT on the menu area, press the **CALIPER** key or the **EXIT** key on the control panel.

NOTE: The following instructions assume that you first scan the patient and then press **FREEZE**.

4-4-8-1 Distance and Tissue Depth Measurements (2D and M Mode)

1.) Press the **CALIPER** key and then select GENERIC DIST. on the menu area.
2.) Select the appropriate item on the menu area. An active cursor appears.
3.) To position the active cursor at the start point (distance) or the most anterior point (tissue depth), move the **TRACKBALL**.
4.) To fix the start point, press **SET** (the right or left trackball key).
The system fixes the first cursor and displays a second active caliper.
5.) To position the second active caliper at the end point (distance) or the most posterior point (tissue depth), move the **TRACKBALL**.
6.) To complete the measurement, press **SET**.
The system displays the distance or tissue depth value in the measurement results window.

Before you complete a measurement:

To toggle between active calipers, or to re-adjust the traced line, press the upper trackball key.

To erase results, press the **CLEAR ALL** key on the control panel or the **DELETE STUDY.** on the keyboard.

NOTE: To alternate the control from one cursor to the other, press **CHANGE** *(the upper trackball key).*
To re-adjust a traced line, press **UNDO** *(the upper trackball key) repeatedly.*

NOTE: To exit Generic measurements, select the EXIT *key on the Touch Panel, press the* **CALIPER** *key or the* **EXIT** *key on the control panel.*

4-4-8 Generic Measurements (cont'd)

4-4-8-2 Circumference/Area Measurements

1.) Press the **CALIPER** key and then select GENERIC AREA on the menu area.
2.) Select the corresponding item on the menu area. An active cursor displays.
3.) To position the active cursor, move the **TRACKBALL**.
4.) To fix the start point, press **SET** (the right or left trackball key). The system fixes the first cursor and displays a second active caliper.
5.) To position the second caliper, move the **TRACKBALL** and press **SET** (Rt./Lt. trackball key).

NOTE: *If you have selected a "trace" item, the measurement is finished and the area and circumference results appear on the screen.*

6.) An ellipse appears the axis of which is defined by these two points.
To adjust the width of the ellipse, move the **TRACKBALL**.
7.) To toggle between calipers, or to readjust a traced line, press the upper trackball key.
8.) To complete the measurement, press **SET** (right or left trackball key). The system displays the circumference and area in the measurement results area.

Before you complete a measurement:

- To erase the ellipse resp. trace and the current data measured, select CANCEL once and select DELETE LAST on the menu area.
The original caliper is displayed to restart the measurement.
- To exit the measurement function without completing the measurement, select EXIT on the menu area, press the **CALIPER** key again or press **EXIT** on the control panel.

4-4-8-3 Volume Measurements

1.) Press the **CALIPER** key and then se;ect GENERIC VOLUME on the menu area.
2.) Select the appropriate item.
3.) Perform the measurement(s) using the **TRACKBALL** and **SET** (right or left trackball key).
For further details: Section 4-4-8-1 on page 4-30 and Section 4-4-8-2 on page 4-31.

4-4-8-3-1 Multiplane Measurements

NOTE: *This volume measurement is only possible in 3D Mode.*

1.) Select the reference image in which the measurement is to be performed (A, B or C).
2.) Press the **CALIPER** key once and then select MULTIPLANE on the menu area.
3.) Select the first section through the body by rotating the **REF.SLICE** or by rotating the **C MODE** digipot. (first section should be set at the edge of the object)
4.) Position the start dot of the area which should be surrounded and store it with **SET**.
5.) Surround the area with the trackball, then press **SET** (right or left trackball key). The area is calculated and displayed. It may even be "zero". Press the **SET** key twice.
6.) Select the next parallel section with the **REF. SLICE** digipot or the **C MODE** digipot, and measure the area.
7.) Repeat 5. and 6. until the edge of the measured object is reached.

NOTE: *To erase the results, select the* CLEAR *key on the* control panel.

4-4-8 Generic Measurements (cont'd)

4-4-8-4 Measurements in Spectral Doppler Mode

NOTE: The Spectral Doppler image is displayed based on time (X-axis) and velocity (Y-axis).

4-4-8-4-1 Auto Trace

1.) Press the **CALIPER** key.
2.) Select AUTO TRACE on the menu area. It traces the Spectral Doppler image automatically and displays the results (according to the Measure Setup).
3.) Select the **SENSITIVITY** of the envelope curve (to eliminate artifacts).
4.) Select the **TRACE MODE** channel of the envelope curve (upper, both, lower).
5.) If necessary, select the Angle and the Baseline.
6.) Press the right or left trackball key **SET** to finish the measurement.

Before you complete the measurement:

- To readjust the start cycle (vertical yellow line), press **CHANGE** (upper trackball key). Press **SET** (right or left trackball key) to fix the line.
- Press the **CHANGE** key again to readjust the end cycle (vertical green line). Press **SET** to fix the line.

NOTE: The determination of the envelope curve requires a clear and low-noise record of the Doppler spectrum. Otherwise the reliability of the displayed measurement results may not be ensured!

4-4-8-4-2 Manual Trace

1.) Press the **CALIPER** key.
2.) Select MANUAL TRACE on the menu area. A cursor appears on the screen.
3.) Move the cursor with the **TRACKBALL** to the start point of the measurement and press **SET** (right or left trackball key) to fix the marker.
4.) Trace to the end of the period and press the **SET** key again to fix the mark. The measurement results appear on the screen.

Before you complete the measurement:

To readjust the traced line, press **UNDO** (upper trackball key) repeatedly.

4-4-8-4-3 Heart Rate

1.) Press the **CALIPER** key.
2.) Select HR on the menu area. A line appears on the screen.
3.) Move the line with the **TRACKBALL** to the start point of the period and press **SET** (right or left trackball key). A second line appears.
4.) Move the second line to the end point of the period.
5.) Select the number of “HR cycles” for the measurement with the digipot on the control panel.
6.) Press the **SET** (right or left trackball key) again to fix the line. The Heart Rate is displayed.

NOTE: For further Doppler Measurements and other details refer to the Voluson® S8 / Voluson® S6 Basic User Manual, Chapter 11

4-4-9 Calculations

The Voluson® S8 / Voluson® S6 system supports calculation packages and application-oriented patient Worksheets (Reports) for following applications:

- Abdomen Calculations
- Small Parts Calculations
- Obstetric Calculations
- Cardiology Calculations
- Urology Calculations
- Vascular Calculations
- Gynecology Calculations
- Pediatric Calculations
- Neurology Calculations
- Musculoskeletal Calculations

NOTE: Confirm that the patient information is correct and the probe and application are selected properly.

NOTE: Different menus are displayed depending on:
• the currently chosen Application
• the selected Display Mode,
• the selected “Study”,
• and the settings in the Measure Setup - **MEASURE & CALC** *page.*

For further details refer to the Voluson® S8 / Voluson® S6 Basic User Manual, Chapter 11

General remarks to perform Calculations:

- By pressing the **CALC** key on the control panel the Calculation function is switched on.
- Positioning of measurement marks is done with the **TRACKBALL**.
- Entering and storage of measuring marks is done with **SET** (right or left trackball key).
- To change measuring marks before completion press **CHANGE** (upper trackball key).
- Depending on the setting in the Measure Setup, also the **FREEZE** key can be used for confirming the last measuring mark of the currently performed measurement.
- The status bar area shows the current function of the trackball.
- To cancel the measurement of the currently selected item, select CANCEL on the menu area.
- To delete the results of the last measured item, select DELETE LAST on the menu area.
- To delete all measurement results of the selected “Study” from the monitor as well as from the corresponding Worksheet, select the CLEAR STUDY key on the menu area.
- All measurement results will be automatically included in the corresponding patient worksheet.
- To erase measurement results from the screen, press the **CLEAR** key on the control panel or press the **DEL** key on the keyboard.
- To exit from Calculations select the EXIT key on the menu area, press the **CALC** key or press the **EXIT** key on the control panel.

4-4-9-1 Worksheet (Report) Pages

Press the **REPORT** key on the control panel to view the “application dependent” patient worksheet pages that contain the results of calculations and measurements. Any stored patient worksheet can be edited, printed, transferred, saved in the Archive or sent to DICOM server.

4-4-10 Probe/Connectors Usage

4-4-10-1 Connecting a probe

1.) Place the probe's carrying case on a stable surface and open the case.
2.) Carefully remove the probe and unwrap the probe cable.
3.) DO NOT allow the probe head to hang free.
Impact to the probe head could result in irreparable damage.
4.) Align the connector with the probe port and carefully push into place.

4-4-10-2 Activating the probe

1.) Press the **PROBE** key to activate the “Probe Select” menu.
2.) Select the appropriate probe by selecting the corresponding menu.
3.) Upon selection of an “Setting Groups”, the programmed user presets appear.
4.) Selecting a “Setting” key causes loading of the preset.

The probe is initialized, the menu area shows the main menu (2D mode) and the ultrasound image appears on the monitor in write mode (real time display).

4-4-10-3 Deactivating the probe

When deactivating the probe, the probe is automatically placed in standby mode (read mode).

1.) Press the **FREEZE** key.
2.) Gently wipe the excess gel from the face of the probe. (Refer to the Basic User Manual of Voluson® S8 / Voluson® S6 for complete cleaning instructions.)
3.) Carefully slide the probe around the side of the keyboard, toward the probe holder. Ensure that the probe is placed gently in the probe holder.

4-4-10-4 Disconnecting the probe

Prior to disconnect a probe freeze the image. It is unnecessary to switch the unit off.

CAUTION **If a probe is disconnected while running (write mode) a software error may occur. In this case switch the unit OFF (perform a reset).**

1.) Remove the cable from the cable holder and close the door.
2.) Move lever to the right position to lock probe. Pull the probe and connector straight out of the probe port.
3.) Carefully slide the probe and connector away from the probe port and around the right side of the keyboard. Ensure the cable is free.

4-4-11 Patient Archive (Image Management)

The Voluson® S8 / Voluson® S6 provides an Patient/Image Management System that allows fast and extremely easy patient, exam and image management.

Figure 4-17 Patient Archive - ARCHIVE

- **Current Patient:**
  The entered patient data will be used in calculations, patient worksheets, DICOM settings and is displayed on the screen to identify images.
- **Archive:**
  The patient archive database is used for searching a particular exam and/or patient.
  Via the ARCHIVE button, it is possible to send images over the DICOM network, print exams/ images, export exams/images, import exams/images, etc.
- **Image History:**
  Image History gives you access to all the US pictures and exams of a particular patient.
- **Exam Review:**
  Exam Review allows you to view all exams of a particular patient. Additionally it is possible to view image properties, input comments and voice annotations, etc.

NOTE: For detailed description of image management functionality and its topics refer to Chapter 12 in the Basic User Manual of Voluson® S8 / Voluson® S6.

*NOTE: Images can be backed up and restored by means of the **Image Archive** function in the System Setup. Operation see: Section 4-5-6 "Archiving Images" on page 4-47.*

4-4-12 Erasing DVD/CD

1.) Press the **UTILITIES** key on the control panel.

2.) In the “Utilities” menu select SYSTEM SETUP to invoke the setup desktop on the screen.

3.) On the left side of the screen select CONNECTIVITY and then click the **DRIVES** tab.

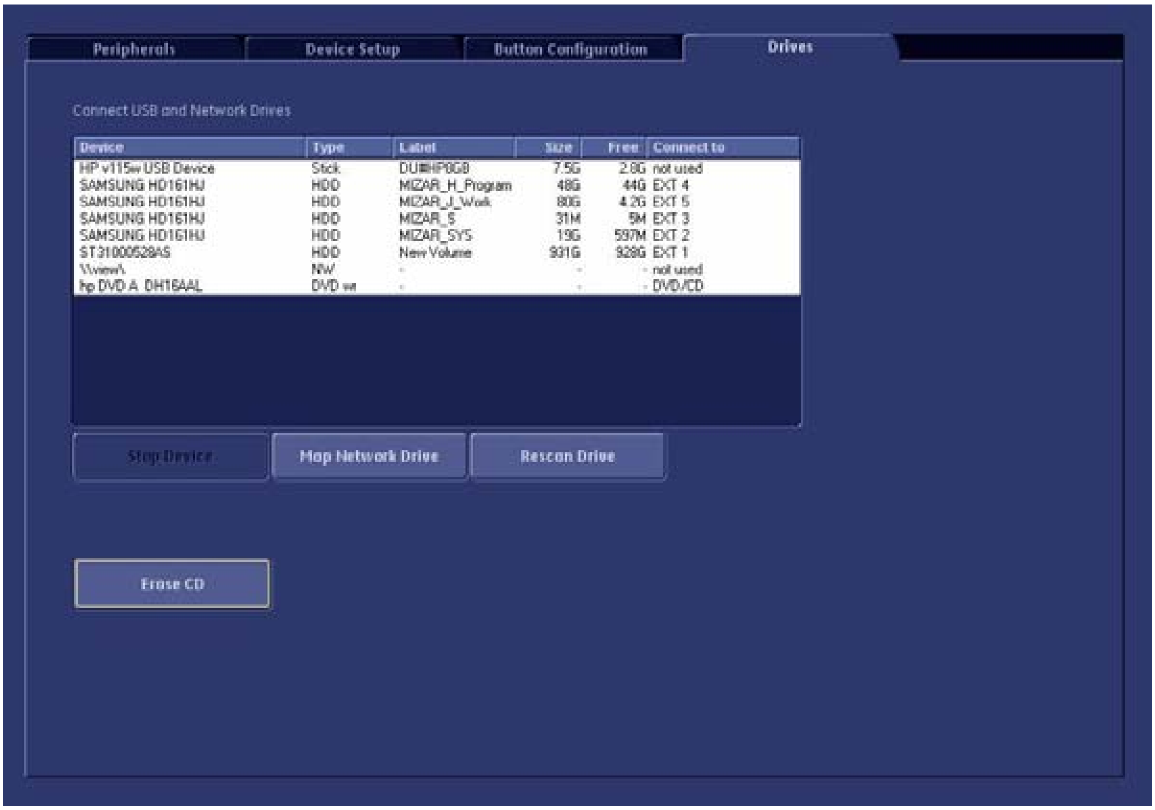


Figure 4-18 System Setup - Connectivity - DRIVES page

4.) Click the ERASE CD button to displays the “Erase DVD/CD” window as shown in Figure 4-19.

5.) Select the “Erase Mode” and click the [OK] button to start the process.

NOTICE It is highly recommended to use the complete erase mode, to avoid problems with the CD+(R)W! When using a DVD+R/RW,just the fast erase mode is possible.

Figure 4-19 Erase DVD/CD Window

6.) When erasing is finished, select EXIT to return to the Scan Mode.

Section 4-5
Backup and Restore Database, Preset Configurations and Images

CAUTION It is recommended to **Backup the Full System Configuration** (Section 4-5-3 on page 4-42) and the **Image Archive** (Section 4-5-6 on page 4-47) **once a week.**

1.) Press the **UTILITIES** key on the control panel.
2.) In the “Utilities” menu select SYSTEM SETUP to invoke the setup desktop on the screen.
3.) On the left side of the screen select BACKUP and then click the **SYSTEM CONFIGURATION** tab.

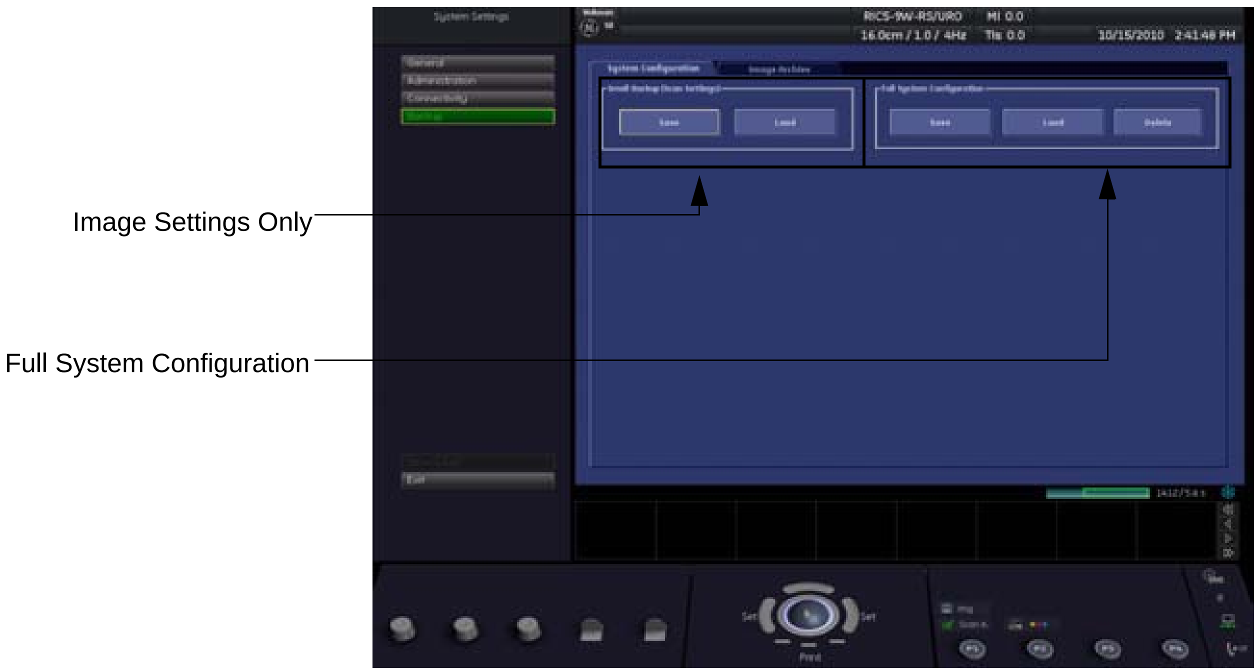


Figure 4-20 System Setup - Backup - SYSTEM CONFIGURATION page

The **SYSTEM CONFIGURATION** page is subdivided in 2 main groups:

A.) Image Settings Only

- Section 4-5-1 "Save Image Settings Only" on page 4-38
- Section 4-5-2 "Load Image Settings Only" on page 4-39

B.) Full System Configuration

- Section 4-5-3 "Save Full System Configuration (Full Backup)" on page 4-42
- Section 4-5-4 "Load Full System Configuration (Full Backup)" on page 4-44
- Section 4-5-5 "Delete Full System Configuration (Full Backup)" on page 4-46

The Image Settings and/or Full System Configuration can be saved to the following destinations:

- D: partition of internal hard disk
- DVD/CD+R/RW
- Mapped Network Drive, see: Section 3-12-1 "Map Network Drive" on page 3-60
- Any other drive connected to the system (e.g.; USB-Stick or external hard disk drive)
  Note: This function is only available in the Full Backup utility.
  For further details review: Section 3-5-9 on page 3-22

4-5-1 Save Image Settings Only

The Image Settings contains:

- Application Settings
- User Programs
- Auto Text
- 3D/4D Programs
- Scan Assistant

1.) Insert a DVD/CD+R/RW into the drive or connect an external USB device.
2.) Press the **UTILITIES** key on the control panel.
3.) In the “Utilities” menu select SYSTEM SETUP to invoke the setup desktop on the screen.
4.) On the left side of the screen select BACKUP and then click the **SYSTEM CONFIGURATION** tab.
5.) Click the SAVE button of the “Small Backup(Scan Settings)” group.

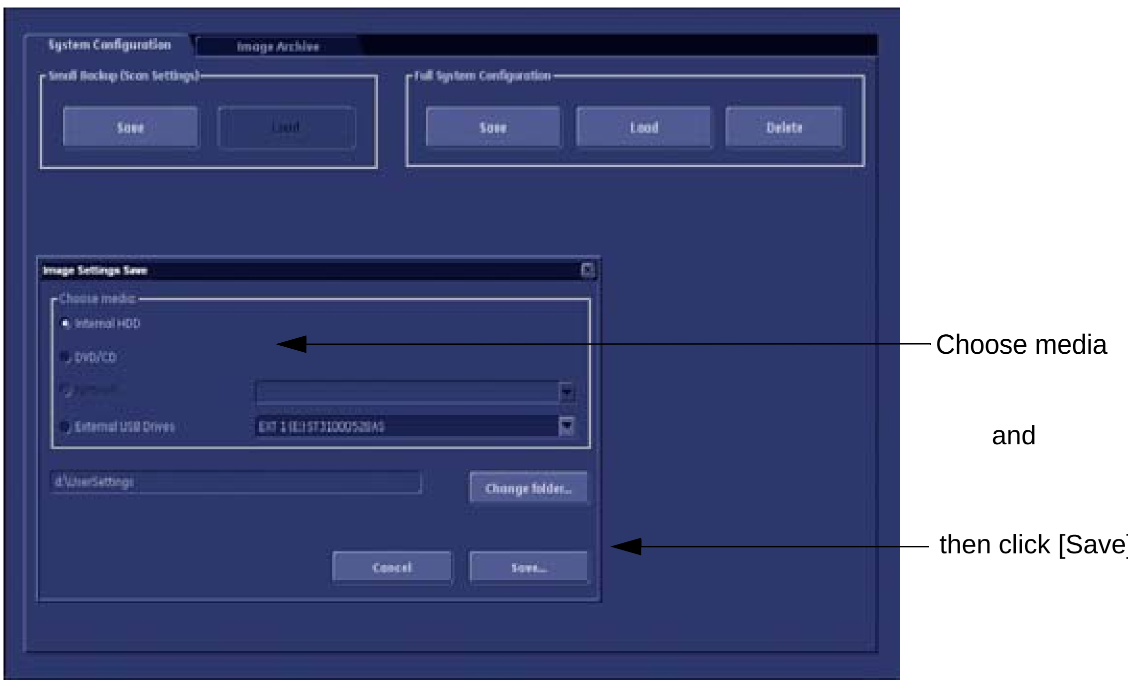


Figure 4-21 Image Settings Only - Save window

6.) Choose the media and click the SAVE button.
7.) Select the NEW FILE... key and enter a file name (without extension).
8.) Click the OK key to start the process. When the saving has been completed, click OK.

4-5-2 Load Image Settings Only

CAUTION The loading procedure overwrites the existing image settings on the local hard drive.
Make sure to insert the correct System DVD.
Additionally you can load the image settings from D:\usersettings\FactoryDefault\Mizar

4-5-2-1 Preparations

1.) Insert a DVD/CD+R/RW into the drive or connect an external USB device.
2.) Press the **UTILITIES** key on the control panel.
3.) Select SYSTEM SETUP button to invoke the setup desktop.
4.) On the left side of the screen select BACKUP and then click the **SYSTEM CONFIGURATION** tab.
5.) Click the LOAD button of the "Small Backup (Scan Settings)" group.

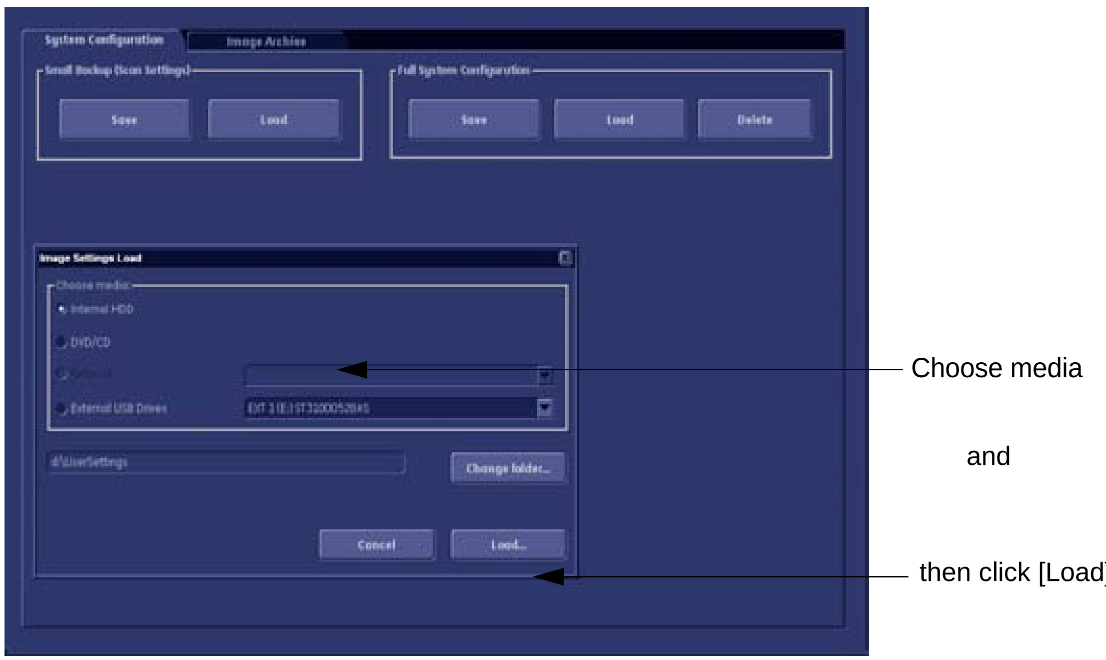


Figure 4-22 Image Settings Only - Load window

6.) Choose the media and click LOAD.

NOTE: *If it is desired to load image settings from media **Internal HDD**, click on the CHANGE FOLDER button, browse for the folder "D:\usersettings\FactoryDefault\Mizar" and then click the LOAD button.*

7.) Select the appropriate file and click OK.
8.) Select the desired loading procedure:
- Load "Complete Backup" on page 4-40
- Load only parts of the "Complete Backup" on page 4-41

4-5-2-2 Load “Complete Backup”

NOTE: Following procedure should be used, if the user prefers factory default settings, which are adapted for the installed Application Software version.

1.) Perform Section 4-5-2-1 "Preparations" on page 4-39.

2.) Select the **“Complete Backup”** (marked blue; see: Figure 4-23 below) and click the >> button to copy the Complete Backup into the Load Data field.

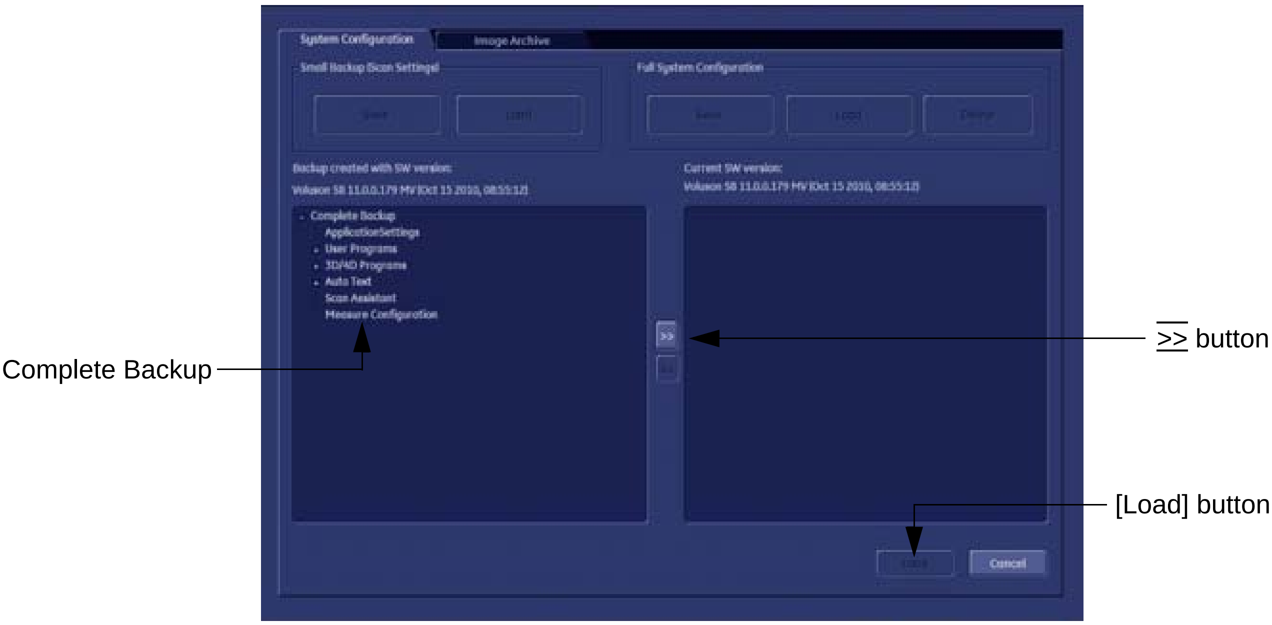


Figure 4-23 Load Backup Data

3.) Click the LOAD button to start the loading procedure of the complete backup into the system.

The US Application Software restarts.

4-5-2-3 Load only parts of the “Complete Backup”

NOTE: Following procedure should be used, if the user has saved own User Programs, 3D/4D Programs or AutoText entries, but new presets have to be added to match the installed Application Software version (e.g., User Programs and 3D/4D Programs for new probe, etc.).

1.) Perform Preparations on page 4-39.

2.) Click the + sign (next to “Complete Backup”) to open the content tree.

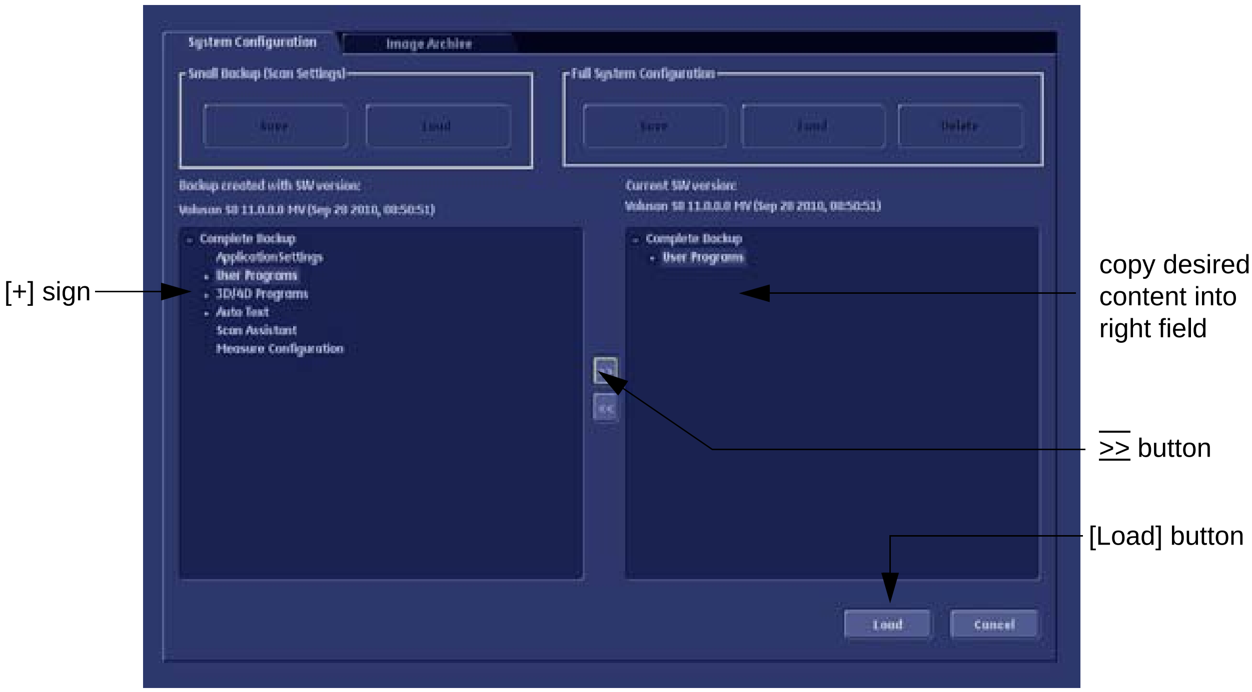


Figure 4-24 Load image settings for probe (e.g., RAB4-8-D)

3.) Click the + sign next to “UserPrograms”, select the desired probe(s) and copy the content by clicking the >> button.

4.) Click the + sign next to “3D/4D Programs”, select the desired probe(s) and copy the content by clicking the >> button.

NOTE: To return selected items from the “Load Data” field to “Backup Data” field select the << button.

5.) Confirm selection with the LOAD button.

Settings will be loaded and the US Application Software restarts.

4-5-3 Save Full System Configuration (Full Backup)

A backup of the Full System Configuration always contains the following data

- User Settings (databases and files containing User Programs, 2D/3D/4D Programs, Auto Text entries, gray curves and complete System settings such as language, time/date format, etc.)
- Measure Configuration (user specific measure setup settings)
- Patient Archive (database containing patient demographic data and measurements) - **no images**
- Options (Permanent Key that is specific for enabled software options and Demo Key)
- Image Transfer Configuration (DICOM settings e.g., DICOM servers, AE Title, Station Name, etc.)
- Network Configuration (network settings including the computer name)
- Service Platform (state of the Service Software)

NOTE: It is recommended to "Full Backup" system configuration data before upgrading the software and/or image settings (presets). This ensures that if settings need to be reloaded, will be the same ones the customer was using prior to service.

1.) Press the **UTILITIES** key on the control panel.
2.) In the "Utilities" menu select SYSTEM SETUP to invoke the setup desktop on the screen.
3.) On the left side of the screen select BACKUP and then click the **SYSTEM CONFIGURATION** tab.
4.) Click the SAVE button of the "Full System Configuration" group.

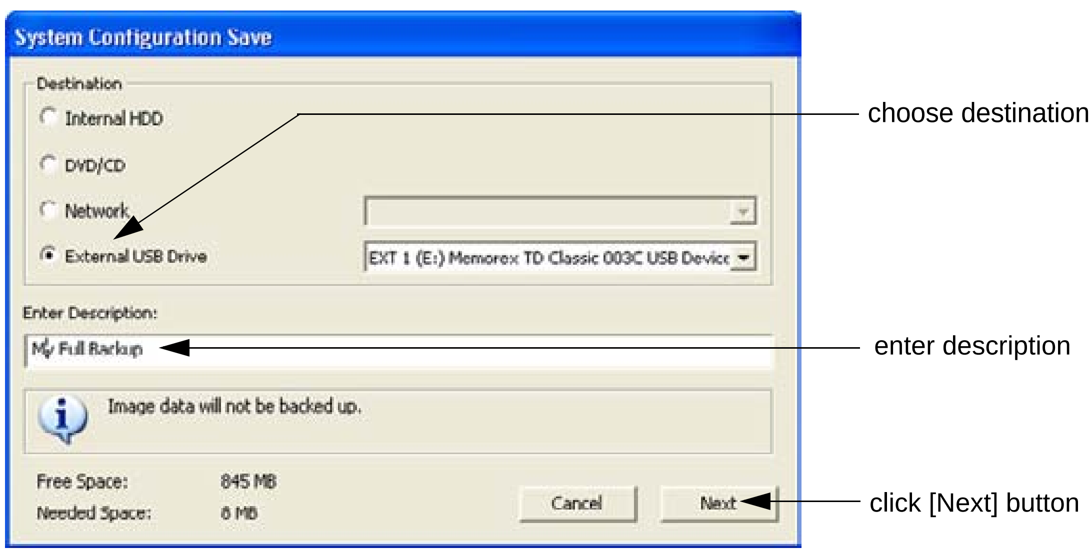


Figure 4-25 System Configuration Save

5.) Choose the Destination.
6.) Enter the description of the full backup.

CAUTION Image data will not be backed up!
To backup the Image Archive, refer to Section 4-5-6 on page 4-47.

7.) Select the NEXT button.
8.) To start the backup process click YES.

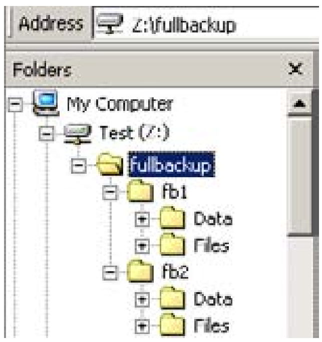
After copying the data, the Voluson® S8 / Voluson® S6 reboots and the application starts again.

4-5-3 Save Full System Configuration (Full Backup) (cont'd)

When the "Full Backup" is saved on a network drive (to map a network drive see: Section 3-12-1 "Map Network Drive" on page 3-60), it may be desirable to move the data (e.g., for backup or maintenance).

The backups reside in sub folders of the main "*fullbackup*" -folder found at the root of the drive.
For Example: Backups on the mapped **Network Drive** are below path **Z:\fullbackup**.

The directory structure of the full backup data is as follows:

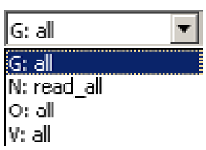


The sub folders have the names *fbX* where ***X*** is a number (e.g., Z:\fullbackup\fb1).

The data resides within a directory structure within these sub folders. It is possible to move the *fbX* sub folders, even leaving gaps in the numeration sequence.

However, **NO** change **MUST** be made to the contents of the *fbX* folders itself, otherwise the backup data cannot be restored!

Figure 4-26 directory structure of full backup data



If the destination „Other drive" is selected, the available drives (e.g., external USB-memory stick) can be chosen from the drop down menu.

Figure 4-27 "Other drive" drop down menu

NOTICE When the backup is saved to an external USB-device, the system has to be informed about the removal of the hardware. For this purpose every last dialog of "Full Backup Save" and "Full Backup Delete" has a STOP USB DEVICES button (see: Figure 4-28).

Figure 4-28 Please stop USB Devices before unplugging!

For further details review: Section 3-5-9 on page 3-22.

4-5-4 Load Full System Configuration (Full Backup)

WARNING ***It is recommended to backup data before an upgrade; see: Section 4-5-3 on page 4-42.***
The "Full Backup" loading procedure replaces (overwrites) ALL the existing data (except Application Settings which are adapted for the used System software version) on the local hard drive of the Voluson® S8 / Voluson® S6 system!

NOTICE It is **neither required nor advisable to reload a previously stored "Full Backup"** after a software upgrade that was performed by means of the FMI FROM DVD button!

CAUTION **There are circumstances where it is not possible to load (restore) all the data.**
The following rules specify these restrictions:

1.) Generally, **only** restoring data from an older to a newer software version is possible.
Loading a backup into a system that has a lower software version than the system the backup was created on is prohibited.

2.) Options can **only** be restored on the same Voluson® S8 / Voluson® S6 system within the same major software version.

3.) When loading a backup into a system with a software version that has a higher major number, the following items will not be restored:

A.) Options

B.) State of the Service Platform

4.) The **user** is **only** allowed to restore data to a different system if and only if the software version on this system is the same as in the backup.

5.) The **user** is **not** allowed to restore the following items to a different system:

A.) Windows Network Settings

B.) Options

C.) DICOM AE Title

D.) DICOM Station Name

E.) State of the Service Platform

4-5-4 Load Full System Configuration (Full Backup) (cont'd)

1.) Press the **UTILITIES** key on the control panel.
2.) In the "Utilities" menu select SYSTEM SETUP to invoke the setup desktop on the screen.
3.) On the left side of the screen select BACKUP and then click the **SYSTEM CONFIGURATION** tab.
4.) Click the LOAD button of the "Full System Configuration" group.

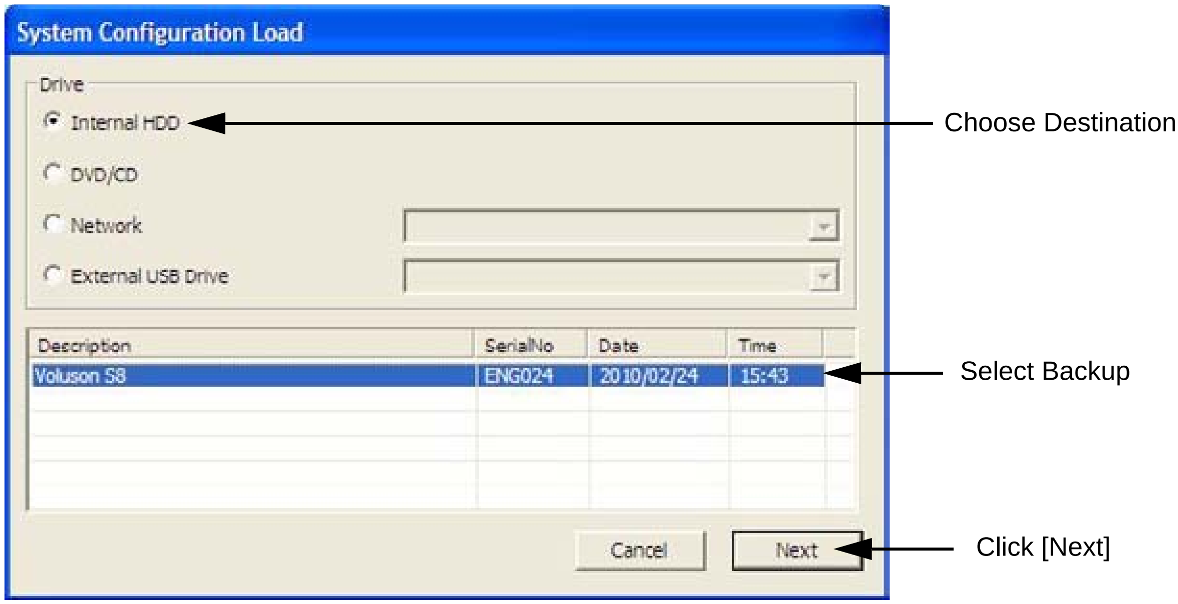


Figure 4-29 System Configuration Load

5.) Choose the Destination.
6.) Click on the backup to be restored (additional information is displayed in the table).
7.) Select the NEXT button. The following window will be displayed.

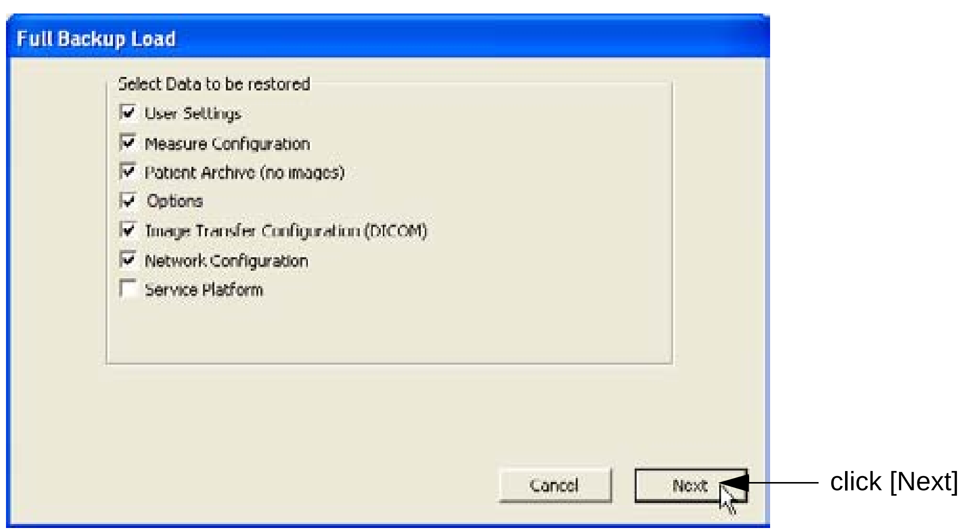


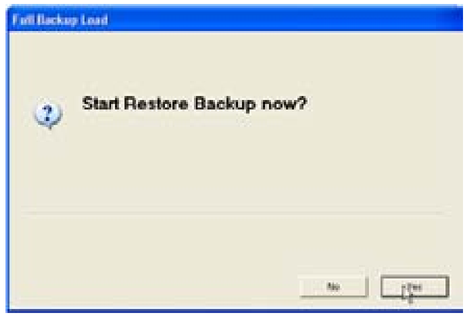
Figure 4-30 Select Data to be restored

8.) Select the data to be restored to the Voluson® S8 / Voluson® S6 system.

NOTE: For description of the check box names refer to:
Save Full System Configuration (Full Backup) on page 4-42.

4-5-4 Load Full System Configuration (Full Backup) (cont'd)

9.) Click the NEXT button and then select YES to start, or NO to cancel the restore procedure.



WARNING

When clicking "YES", the current data on the system will be permanently replaced by the data of the backup and can not be restored!

Figure 4-31 Start Restore Backup now?

After restoring the data, the Voluson® S8 / Voluson® S6 reboots and the application starts again.

10.) Confirm that the date and time are set correctly

4-5-5 Delete Full System Configuration (Full Backup)

1.) Press the **UTILITIES** key on the control panel.
2.) In the "Utilities" menu select SYSTEM SETUP to invoke the setup desktop on the screen.
3.) On the left side of the screen select BACKUP and then click the **SYSTEM CONFIGURATION** tab.
4.) Click the DELETE button of the "Full System Configuration" group.

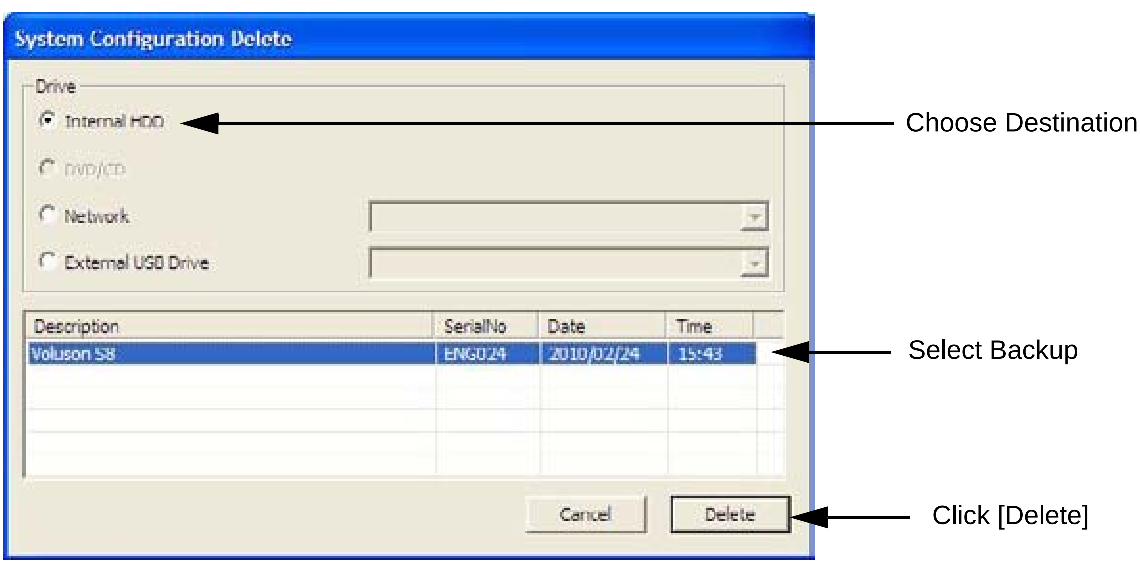


Figure 4-32 System Configuration Delete

5.) Choose the Destination.
6.) Click on the backup to be deleted (additional information is displayed in the table).
7.) Select the DELETE button.

WARNING ***There is no " UNDO" function for this action!***

4-5-6 Archiving Images

CAUTION It is recommended to **Save Image Archive** (Section 4-5-6-1 on page 4-47) and **Backup the Full System Configuration** (Section 4-5-3 on page 4-42) **once a week.**

4-5-6-1 Save Image Archive

*NOTE: A backup of the Image Archive always contains the Patient Archive (database containing patient demographic data and measurements) **+ images** of the selected exams.*

1.) Press the **UTILITIES** key on the control panel.

2.) In the "Utilities" menu select SYSTEM SETUP to invoke the setup desktop on the screen.

3.) On the left side of the screen select BACKUP and then click the **IMAGE ARCHIVE** tab.

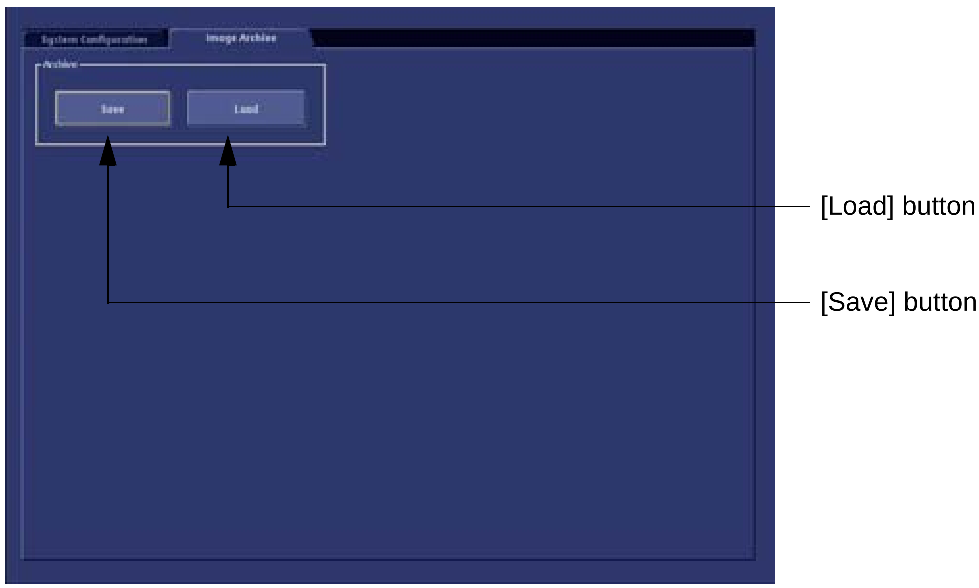


Figure 4-33 System Setup - Backup - IMAGE ARCHIVE page

4.) Click the SAVE button.

Figure 4-34 Image Archive Save - preparations

4-5-6-1 Save Image Archive (cont'd)

5.) Choose archiving span time from the pop-up menu.

NOTICE If for example "All images older than" **1 Day** is chosen (see Figure 4-34 on page 4-47), images of the current day will not be archived! However, if you click the [Advanced] button you can put this right.

6.) If desired, check mark "Remove Local Images after Backup".
7.) Click the ADVANCED button if it is desired to adapt archive data.
8.) Select the NEXT button.

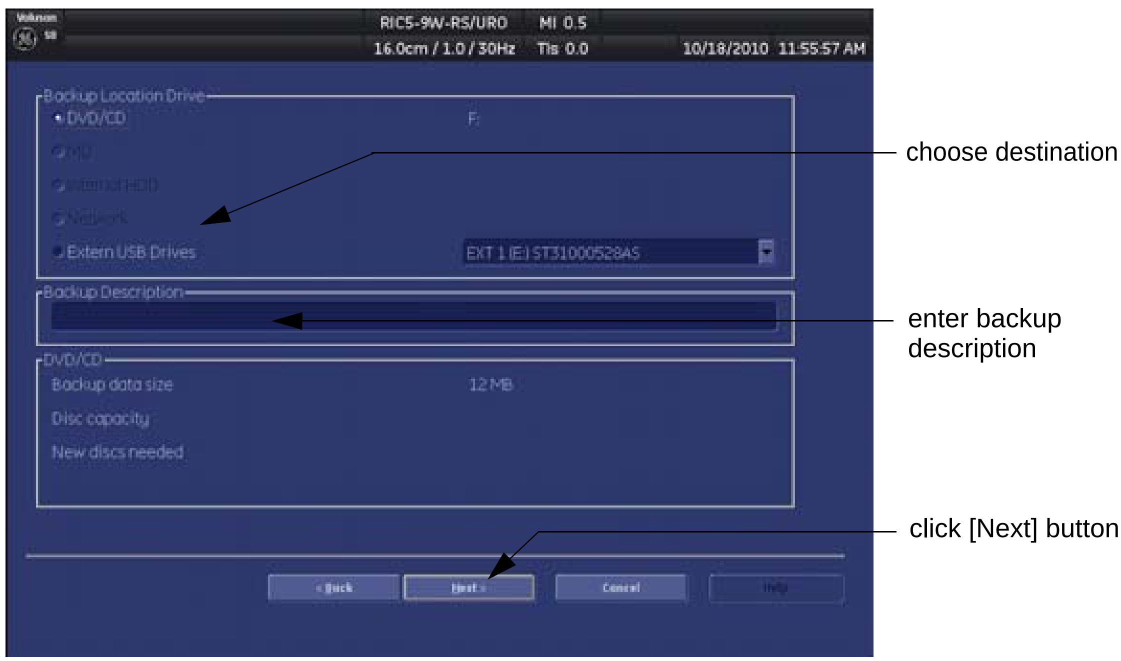


Figure 4-35 Image Archive Save - choose destination

9.) Choose the Destination.
10.) Enter the description of the image backup.

CAUTION **Voluson® S8 / Voluson® S6 presets, configurations and image settings will not be backed up! To Backup the Full System Configuration refer to Section 4-5-3 on page 4-42.**

11.) Select the NEXT button.
12.) To start the backup process click YES.

4-5-6-2 Load Image Archive

1.) Press the UTILITIES key on the control panel.
2.) In the "Utilities" menu select SYSTEM SETUP to invoke the setup desktop on the screen.
3.) On the left side of the screen select BACKUP and then click the IMAGE ARCHIVE tab.
4.) Click the LOAD button (see: Figure 4-33 on page 4-47).

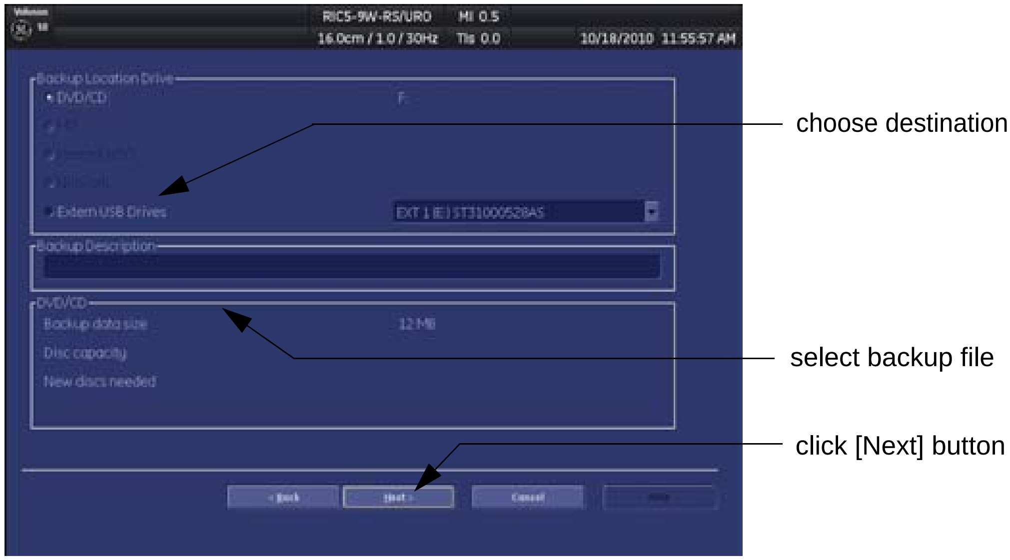


Figure 4-36 Image Archive Load - choose destination

5.) Choose the Destination.
6.) Click on the backup to be restored (additional information is displayed in the table).
7.) Select the NEXT button. The following window will be displayed.

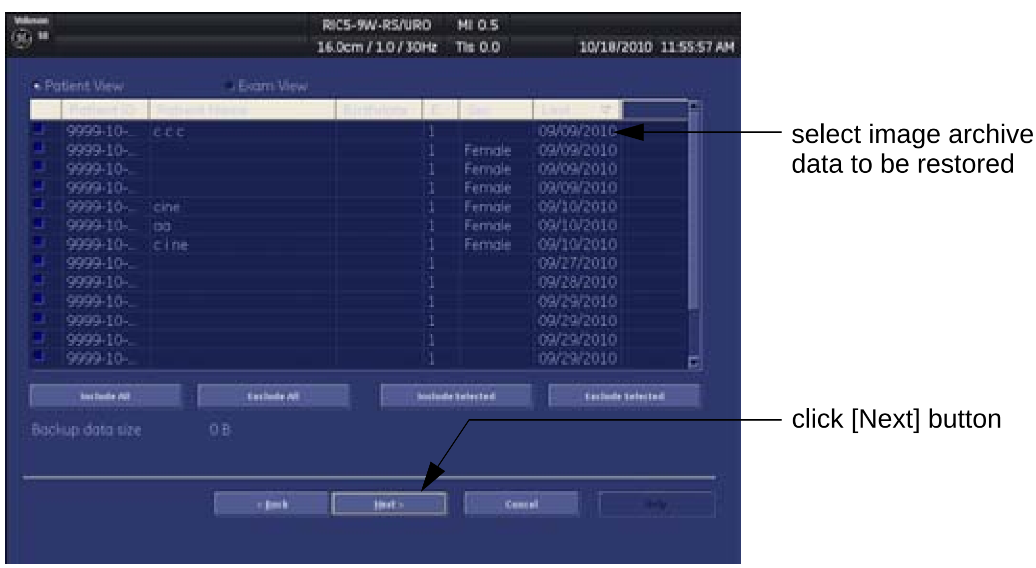


Figure 4-37 select image archive data to be restored

8.) Select (check mark) the image archive data to be restored to the Voluson® S8 / Voluson® S6 system.
9.) Click the NEXT button and then select YES to start, or NO to cancel the restore procedure.

Section 4-6
Software Configuration Checks

4-6-1 System Setup

Press the **UTILITIES** key on the control panel and then select SYSTEM SETUP.
On the left side of the screen select the desired major group.
Each major group contains different pages to check:

Table 4-10 System Setup Checks - GENERAL

Step	Page + Task	Expected Result(s)
1	General: Check Date and Time setting	Date and Time are correct
2	General: Check that Location (Clinic Name) is correct	Location Name is correct
3	General: Check Language settings	desired Language is displayed
4	General: Check EUM Language settings	desired EUM Language is displayed
5	User Setting: Check all the User Settings	settings assigned as desired by the customer
6	Patient Info Display: Check all settings	settings assigned as desired by the customer
7	Scan Assistant: Check settings	settings assigned as desired by the customer

Table 4-11 System Setup Checks - ADMINISTRATION

Step	Page + Task	Expected Result(s)
1	Options: Check that all options are set up correct	D = Demo , I = Inactive , P = Permanent

Table 4-12 System Setup Checks - CONNECTIVITY

Step	Page + Task	Expected Result(s)
1	Peripherals: Check assignment of Report Printer	printer assigned as desired by the customer
2	Peripherals: Check assignment of Foot Switch	Footswitch left/right are assigned as desired by the customer
3	Device Setup: Check DICOM, Network and Archive configuration	setting assigned as desired and required by the customer
4	Button Configuration: Check assignment of remote keys **P1**, **P2**, **P3** and **P4**.	Remote keys are assigned as desired by the customer
5	Button Configuration: Check assignment of START EXAM and END EXAM	buttons are assigned as desired by the customer

4-6-2 Measure Setup

Press the **UTILITIES** key on the control panel and then select MEASURE SETUP.
The Measure Setup desktop offers three different pages to check.

NOTICE Parameters and possible adjustments depend on the selected Application.
To view, add, delete, reorder, edit or when creating a new parameter (in the **MEASURE & CALC** page), it is very important that all items are chosen correctly and that the relevant item is highlighted.
For further information refer to Chapter 18 in the Basic User Manual of Voluson® S8 / Voluson® S6.

Table 4-13 Measurement Setup Checks

Step	Task	Expected Result(s)
1	Measure & Calc: Check all settings for all applications	setting assigned as desired by the customer
2	Application Parameters: Check all settings for all applications	setting assigned as desired by the customer
3	Global Parameters: Check all settings	setting assigned as desired by the customer

Section 4-7
Peripheral Checks

Check that peripherals work as described below:

Table 4-14 Peripheral Checks

Step	Task to do	Expected Result(s)
1	Press the **FREEZE** key.	Stop image acquisition.
2	Press the remote key (**P1**, **P2**, **P3** or **P4**), which is assigned to the BW printer.	The image displayed on the screen is printed on the Black & White printer.
3	Press the remote key (**P1**, **P2**, **P3** or **P4**), which is assigned to the color printer.	The image displayed on the screen is printed on the Color printer.
4	Press the remote key (**P1**, **P2**, **P3** or **P4**), which is assigned to recorder control.	Recording starts/stops.

4-7-1 Control Console Positioning

The control console can be rotated and adjusted in height.

NOTE: For further details refer to Section 5-11-3 on page 5-45.

4-7-2 Brakes and Direction (Swivel) Locks

Check the brakes and swivel locks function as described below.

Table 4-15 Brakes and Direction (Swivel) Lock

Step	Task	Expected Result(s)
1		Swivel lock engaged.
2		Brakes and swivel lock released.
3		Brakes and swivel lock engaged (=full lock)

Section 4-8
Site Log

Table 4-16 Voluson® S8 / Voluson® S6 - Site Log (Paper Documentation)

Date	Service person	Problem	Comments

Chapter 5
Components and Functions (Theory)

Section 5-1
Overview

5-1-1 Purpose of Chapter 5

This chapter explains Voluson® S8 / Voluson® S6's system concepts, component arrangement, and subsystem function. It also describes the Power Distribution scheme and probes.

Table 5-1 Contents in Chapter 5

Section 5-2
General Information

Voluson® S8 / Voluson® S6 is a digital beamforming curved-, linear- and phased array ultrasound imaging system.

The system can be used for:

- 2D Mode Imaging and additional Operating Modes (B-Flow, XTD-View, Coded Contrast Imaging)
- Color Doppler Imaging (CFM, PD, TD and HD-Flow)
- M Mode + MCFM Imaging
- Doppler (PW, CW)
- 3D Mode and Real Time 4D Imaging
- Different combinations of the above modes

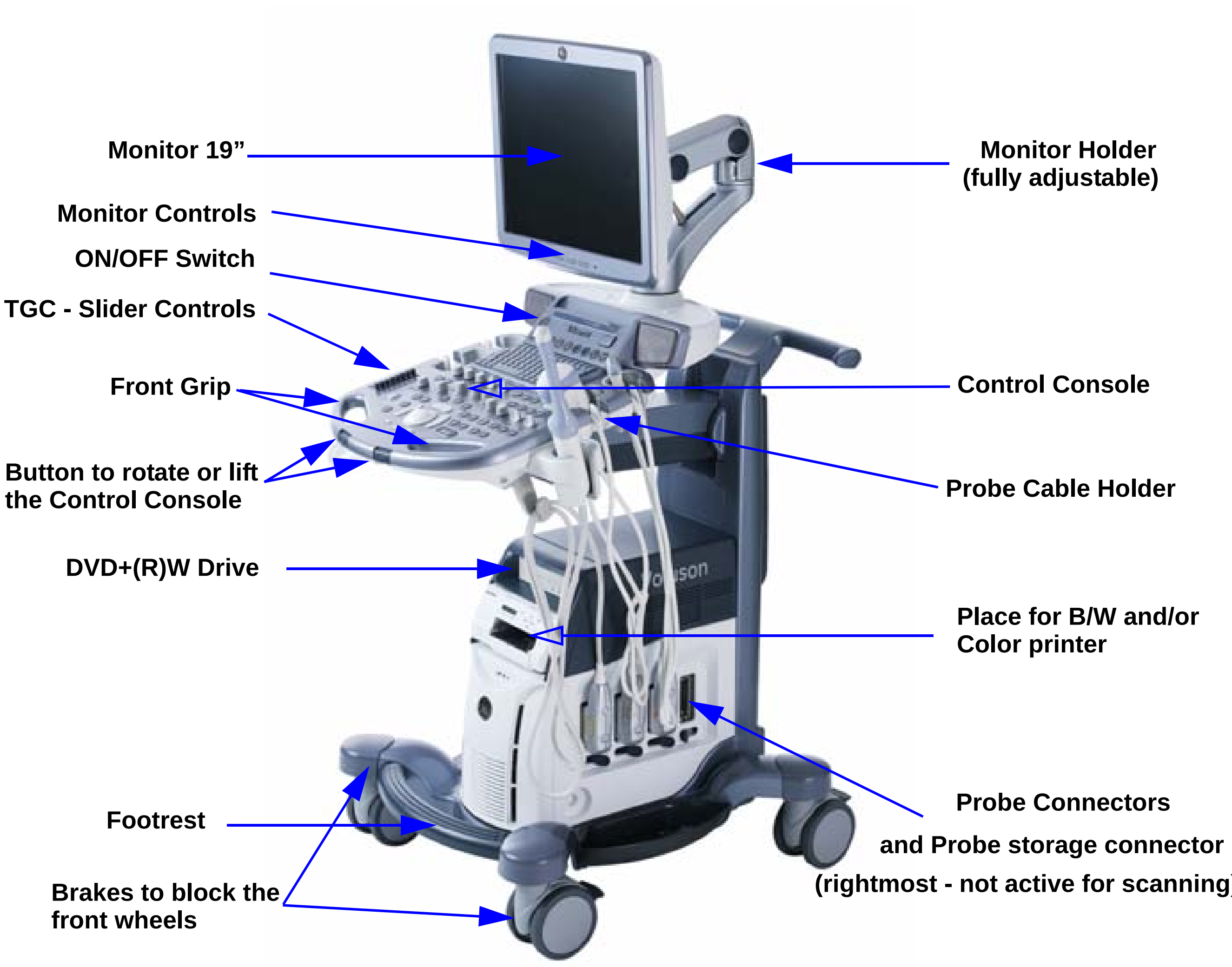


Figure 5-1 Voluson® S8 / Voluson® S6 Major Components

Section 5-2 General Information (cont'd)

Among other significant features of the Voluson® S8 / Voluson® S6 ultrasound system are the following:

- Integrated FrontEnd (uses advanced FGPA technologies)
- Open connectivity using USB ports
- Bluetooth - wireless connectivity
- high performance 19" LCD monitor
- Low profile, backlit Keyboard

Voluson® S8 / Voluson® S6 has a digital beam forming system (incorporated in the FrontEnd) which can handle up to 192 element probes by use of multiplexing.

Signal flow from the Probe Connector Panel, to the FrontEnd (FE) Electronics, to the BackEnd Processor, and finally is displayed on the LCD monitor and peripherals.

Voluson® S8 / Voluson® S6 internal electronics are divided into three:

- Front End (FE) Processor
- Back End Processor
- Power Supply Unit

Interconnecting signals from FrontEnd, BackEnd, keyboard, monitor, and power distribution sub-systems are routed internally.

Major System Components:

- FrontEnd processor: Section 5-3 on page 5-21
- BackEnd processor: 5-4-2 on page 5-27
- Top Console User interface (System I/O with hard keys): Section 5-6 on page 5-30
- Monitor: Section 5-7 on page 5-34
- External I/O: Section 5-8 on page 5-35
- Peripherals: Section 5-9 on page 5-36
- System mechanical chassis: trolley to keep all major components Section 5-11 on page 5-44

Section 5-2 General Information (cont'd)

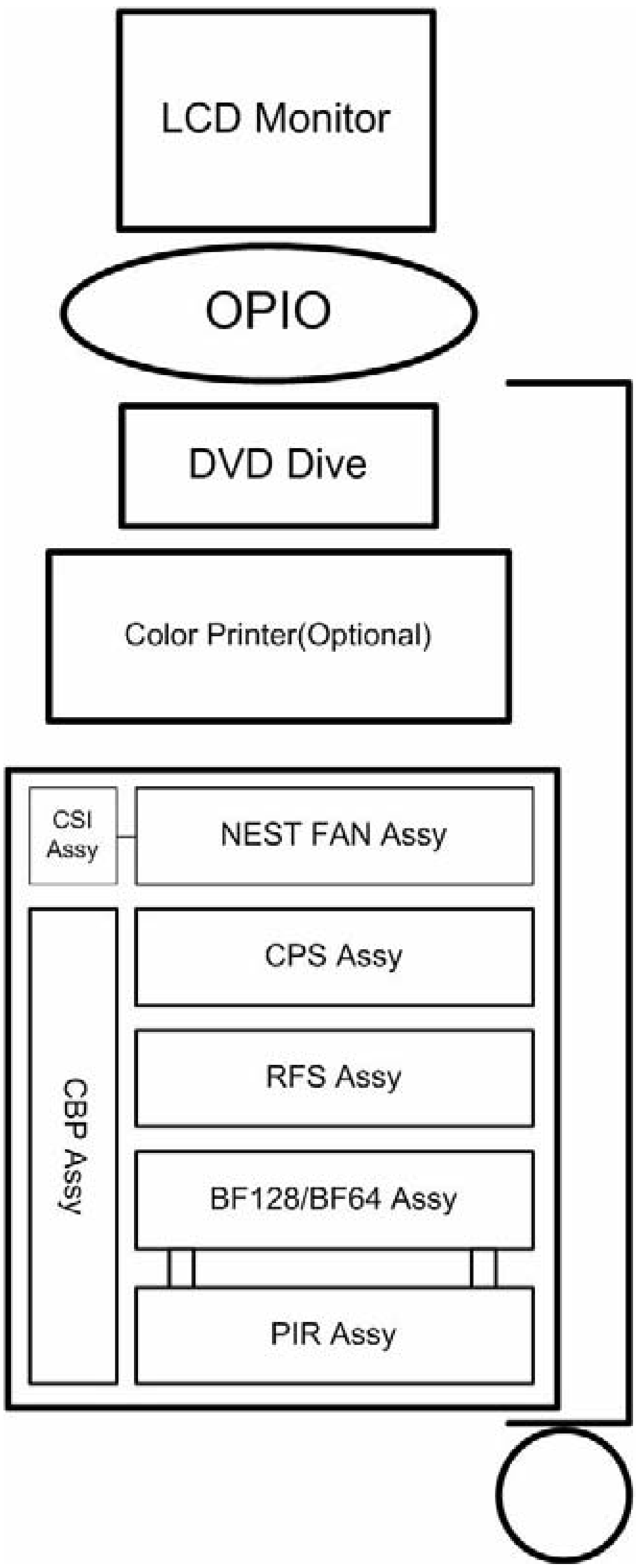


Figure 5-2 Basic Block diagram of Voluson® S8 / Voluson® S6

Section 5-2 General Information (cont'd)

The Voluson® S8 / Voluson® S6 used digital beamforming technology which provides high resolution and high penetration performance. It is a general purpose, mobile, software controlled diagnostic ultrasound scanner. Its function is to acquire ultrasound data and to display the data of different modes. gives the operator the ability to measure anatomical structures and offers analysis packages that provide information that is used to make a diagnosis by competent health care professionals.

The Calculation and Report function supports following application packages:

- Abdomen (ABD)
- Obstetrics (OB)
- Gynecology (GYN)
- Cardiology (CARD)
- Urology (URO)
- Vascular (VAS)
- Neurology (NEURO)
- Small Parts (SM P)
- Pediatrics (PED)
- Musculoskeletal (MSK)

The Voluson® S8 / Voluson® S6 supports a variety of linear- and curved array for various clinical applications.
Any 3 probes may be connected at the same time.

Medical application fields include:

- Obstetrics
- Gynecology and Fertility
- Radiology
- Neurology
- Oncology
- Urology
- Pediatrics
- Musculoskeletal

The system is designed for follow-up expansion.

In addition to the initial operational settings for each transducer pre-programmed in the system, user-customized parameter settings for each transducer may be inserted by the operator and stored for recall as needed via the system control panel. System configuration is stored on the hard drive and all necessary software is loaded from the hard drive on power up.

Biopsy guidelines are provided on screen to assist in the collection of tissue samples, using biopsy guide adapters offered as an optional accessory.

The system provides the ability to perform remote viewing of images without compression, via DICOM 3.0 compatible output. Management of patient history is possible by image-filing function.
High-resolution images are provided by utilizing a technology called digital dynamic receive focusing.

For more detailed explanations of functions and controls refer to the Voluson® S8 / Voluson® S6 Basic User Manual.

5-2-1 Description of Voluson® S8 / Voluson® S6 Operating Modes

5-2-1-1 B-Mode or 2D-Mode

B-Mode or 2D-mode is a two-dimensional image of the amplitude of the echo signal. It is used for location and measurement of anatomical structures and for spatial orientation during operation of other modes. In 2D-mode, a two-dimensional cross-section of a three-dimensional soft tissue structure such as the heart is displayed in real time. Ultrasound echoes of different intensities are mapped to different gray scale or color values in the display. The outline of the 2D cross-section may be a rectangle, parallelogram, sector or 360-degree circle, depending on the particular transducer used.
2D-mode can be used in combination with any other mode.

5-2-1-1-1 B-Flow (optional)

For details review: Section 5-2-4-5 "B-Flow" on page 5-17

5-2-1-1-2 Coded Harmonic Imaging (HI)

In Harmonic Imaging, acoustic aberrations due to tissue are minimized by receiving and processing the second harmonic signal that is generated within the insonified tissue. Voluson® S8 / Voluson® S6´s high performance HI provides superb detail resolution and penetration, outstanding contrast resolution, excellent acoustic clutter rejection and an easy to operate user interface.
Coded Harmonics enhances near field resolution for improved small parts imaging as well as far field penetration. It diminishes low frequency amplitude noise and improves imaging technically difficult patients. It may be especially beneficial when imaging isoechoic lesions in shallow-depth anatomy in the breast, liver and hard-to-visualize fetal anatomy.
Coded Harmonics may improve the B-Mode image quality without introducing a contrast agent.

5-2-1-1-3 XTD-View

XTD-View (Extended View) provides the ability to construct and view a static 2D image which is wider than the field of view of a given transducer. This feature allows viewing and measurement of anatomy that is larger than what would fit in a single image. XTD-View constructs the extended image from individual image frames as the operator slides the transducer along the surface of the skin in direction of the scan plane.
Examples include scanning of vascular structures and connective tissues in the arms and legs.

5-2-1-1-4 Coded Contrast Imaging (optional)

For details review: Section 5-2-4-7 "Coded Contrast Imaging" on page 5-17

5-2-1-2 M-Mode

In M-mode, soft tissue structure is presented as scrolling display, with depth on the Y-axis and time on the X-axis. It is used primarily for cardiac measurements such as value timing on septal wall thickness when accurate timing information is required. M-mode is also known as T-M mode or time-motion mode. Ultrasound echoes of different intensities are mapped to different gray scale values in the display.
M-mode displays time motion information of the ultrasound data derived from a stationary beam. Depth is arranged along the vertical axis with time along the horizontal axis. M-mode is normally used in conjunction with a 2D image for spatial reference. The 2D image has a graphical line (M-line) superimposed on the 2D image indicating where the M-mode beam is located.

5-2-1-2-1 MCFM Mode (M Mode + Color Flow Mode)

Color Flow Mode and Color M Mode are Doppler modes intended to add color-coded qualitative information concerning the relative velocity and direction of fluid motion within the 2D mode or M mode image. Color Flow overlays color on the M mode trace using velocity and variance color maps. The Color Flow wedge overlays the 2D mode image and M mode timeline.

5-2-1-3 Color Doppler Modes

Color Doppler is used to detect motion presented as a two-dimensional display.
There are following applications of this technique:

- Color Flow Mode (C) - used to visualize blood flow velocity and direction
- Power Doppler (PD) - used to visualize the spatial distribution of blood
- Bi-Directional Angio (HD-Flow) - used to visualize flow direction with spatial resolution and low artifact visibility
- Tissue Doppler (TD) - used to visualize tissue motion direction and velocity

5-2-1-3-1 Color Flow Mode

A real-time two-dimensional cross-section image of blood flow is displayed. The 2D cross-section is presented as a full color display, with various colors being used to represent blood flow (velocity, variance, power and/or direction). Often, to provide spatial orientation, the full color blood flow cross-section is overlaid on top of the grayscale cross-section of soft tissue structure (2D echo). For each pixel in the overlay, the decision of whether to display color (Doppler), gray scale (echo) information or a blended combination is based on the relative strength of return echoes from the soft tissue structures and from the red blood cells. Blood velocity is the primary parameter used to determine the display colors, but power and variance may also used. A high pass filter (wall filter) is used to remove the signals from stationary or slowly moving structures. Tissue motion is discriminated from blood flow by assuming that blood is moving faster than the surrounding tissue, although additional parameters may also be used to enhance the discrimination. Color flow can be used in combination with 2D and Spectral Doppler modes as well as with 3D mode.

5-2-1-3-2 Power Doppler

A real-time two dimensional cross-section of blood flow is displayed. The 2D cross-section is presented as a full color display, with various colors being used to represent the power in blood flow echoes. Often, to provide spatial orientation, the full color blood flow cross-section is overlaid on top of the gray scale cross-section of soft tissue structure (2D echo). For each pixel in the overlay, the decision of whether to display color (Doppler power), gray scale (echo) information or a blended combination is based on the relative strength of return echoes from the soft-tissue structures and from the red blood cells. A high pass filter (wall filter) is used to remove the signals from stationary or slowly moving structures. Tissue motion is discriminated from blood flow by assuming that blood is moving faster than the surrounding tissue, although additional parameters may also be used to enhance the discrimination. The power in the remaining signal after wall filtering is then averaged over time (persistence) to present a steady state image of blood flow distribution. Power Doppler can be used in combination with 2D and Spectral Doppler modes as well as with 3D mode.

5-2-1-3-3 Bi-Directional Angio (HD-Flow Mode)

Directional Power Doppler is a Power Doppler mode incorporating the flow direction (much like Color Doppler) into the displayed image. The focus of the settings for Directional Power Doppler is for high spatial resolution and low artifact visibility, allowing vessels to be seen with less blooming and finer detail.

5-2-1-3-4 Tissue Doppler (option)

The Tissue Color Doppler Imaging is used for color encoded evaluation of heart movements.
The TD image provides information about tissue motion direction and velocity.

5-2-1-4 Pulsed (PW) Doppler

PW Doppler processing is one of two spectral Doppler modalities. In spectral Doppler, blood flow is presented as a scrolling display, with flow velocity on the Y-axis and time on the X-axis. The presence of spectral broadening indicates turbulent flow, while the absence of spectral broadening indicates laminar flow. PW Doppler provides real time spectral analysis of pulsed Doppler signals. This information describes the Doppler shifted signal from the moving reflectors in the sample volume. PW Doppler can be used alone but is normally used in conjunction with a 2D image with an M-line and sample volume marker superimposed on the 2-D image indicating the position of the Doppler sample volume. The sample volume size and location are specified by the operator. Sample volume can be overlaid by a flow direction cursor which is aligned, by the operator, with the direction of flow in the vessel, thus determining the Doppler angle. This allows the spectral display to be calibrated in flow velocity (m/sec.) as well as frequency (Hz). PW Doppler also provides the capability of performing spectral analysis at a selectable depth and sample volume size. PW Doppler can be used in combination with 2D and Color Flow modes.

5-2-1-5 3D Imaging

The Voluson® S8 / Voluson® S6 Ultrasound System will be used to acquire multiple, sequential 2D images which can be combined to reconstruct a three dimensional image. These 3D images are useful in visualizing three-dimensional structures, and in understanding the spatial or temporal relationships between the images in the 2D sequence. The 3D image is presented using standard visualization techniques, such as surface or volume rendering.

5-2-1-6 3D Data Collection and Reconstruction

2D gray scale images including Color Flow or Power Doppler information may be reconstructed.
The acquisition of volume data sets is performed by sweeping 2D-scans with special transducers (called 3D-transducers) designed for the 2D-scans and the 3D-sweep.

2D ultrasound imaging modes are used to view a two dimensional cross-sections of parts of the body. For example in 2D gray scale imaging, a 2 dimensional cross-section of a 3-dimensional soft-tissue structure such as the heart is displayed in real time. Typically, the user of an ultrasound machine manipulates the position and orientation of this 2D cross-section in real time during an ultrasound exam.

By changing the position of the cross-section, a variety of views of the underlying structure are obtained, and these views can be used to understand a 3-dimensional structure in the body.

To complete survey a 3-dimensional structure in the body, it is necessary to collect 2D images which span a volume containing the structure. One way is to sweep the imaging cross-section by translating it in a direction perpendicular to the cross-section. Another example method is to rotate the cross section about a line contained in the cross section. The Voluson® S8 / Voluson® S6 Ultrasound System uses the automated so called C-Scan for the motion perpendicular to automated B-scan. Once a representative set of 2D cross-sections are obtained, standard reconstruction techniques can be used to construct other 2D cross-sections, or to view the collection of the cross-sections as a 3D images.

5-2-1-7 3D Image Presentation

Several techniques can be used to aid the human observer in understanding the resulting 2D image as a representation of a three-dimensional object. One is to rotate the volume of data, and present the resulting sequence of 2D projections to the observer. The changing direction of observation helps the observer to separate the features in the volume according to their distance from the observer.

5-2-1-8 3D Rendering

The 3D (volume) rendering is a calculation process to visualize certain 3D-structures of a scanned volume by means of a 2D-image. The gray value for each pixel of the 2D-image is calculated from the voxels along the corresponding projection path (analyzing beam) through the volume. The render (calculation) algorithm, surface or transparent mode, determines how 3D-structures are visualized.

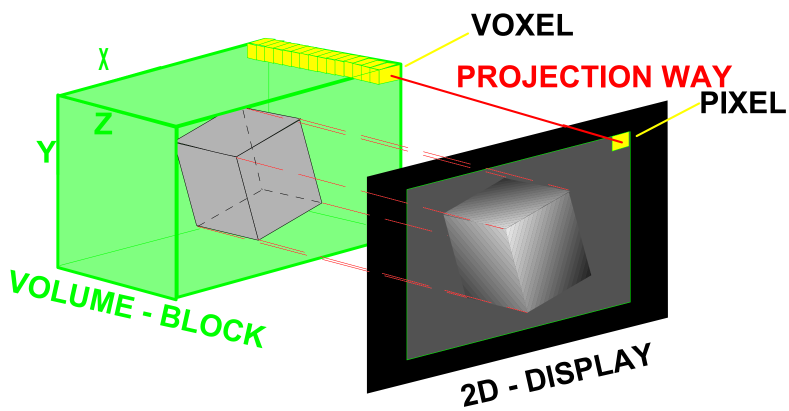


Figure 5-3 Principle: Volume Rendering

5-2-2 Block diagram Voluson® S8 / Voluson® S6

Figure 5-4 Voluson® S8 / Voluson® S6 - Block diagram

5-2-2-1 Front End Block diagram

For further details :

see: "Front End Processor - Block diagram" on page 5-21

see: "PIR - Blockdiagram" on page 5-22

see: "Beamformer + Frontend" on page 5-23

see: "RFS-Board - Block diagram" on page 5-24

5-2-2-2 Back End Block diagram

For further details :

see: "BackEnd Processor - Block diagram" on page 5-26

5-2-2-3 OPIO Block diagram

For further details :

see: "Main OPIO - Block Diagram" on page 5-30

5-2-3 Data Flow Control Description

This section describes the functions of the boards vs. different operation modes.

- BF128 / BF64 - Beamformer Motherboard
- RFS - Mid-Processor, System Control and DMA Controlle

5-2-3-1 B-Mode

1.) RFS

The RFS contains the Clock-Management and PRF-Generator.
It generates(drives) BF(=Beamformer)-FPGA-Clock (200MHz) and Shot-Trigger for the Beamformer board (BF128 or BF64).
Configures PIR (Probe Interface board) and Beamformer (BF128 or BF64 with Tx-Frequency, Tx-Focus, Rx-Focus, LineNo (lateral Position), Tx- Apodization, RX-Apodization, Multibeam, etc. The RFS board also contains the Tx-Power-Reference-DAC.

Furthermore it contains Multibeam-DeInterleave, Subtraction Filter (for HI-Mode, see: Section 5-2-3-1-1 "Special B-Mode Techniques" on page 5-12, DigitalTGC, DC-Canceler, Mixer (Part of Demodulator), LowPassFilter, Decimation (Pixel rate Conversion), Magnitude Calculator (Part of Demodulator), Logarithmic Amplifier, Re-Sample, Edge Enhance (Contrast Enhancement through differentiation), Frame Filter, Blending (adapting Brightness in order to perfectly combine Nearfield-Frame with Farfield-Frame in FFC-Mode, see: Section 5-2-3-1-1 "Special B-Mode Techniques" on page 5-12.

Multibeam-DeInterleave means: Incoming Pixel order
shot1**pix1**-shot2**pix1**-shot3**pix1**-shot4**pix1** -
shot1**pix2**-shot2**pix2**-shot3**pix2**-shot4**pix2**...
is converted to the new order:
shot1pix1-**shot1**pix2-**shot1**pix3..... - **shot2**pix1-**shot2**pix2-**shot2**pix3.....

After DC-cancelling the signal is mixed with RX-Frequency and brought to LF-Spectrum, where the LowPassFilter cuts HF. Mixer and Magnitude-Calculator arrange Complex Demodulation, and Logarithmic Amplifier arrange the conversion from High-Dynamic LinearSignal to the Low-Dynamik(e.g.8Bit) Log-Signal. Several Postprocessing steps (LineFilter, FrameFilter, ReSample, Edge Enhance) enable smooth image quality while keeping contrast high.

a.) Direct Memory Access (DMA) section

B-mode-Data from RFS is written via Signal Processor (SP) Channel 0 into SDRAM Fifo Buffer memory. DMA Controller 0 transfers the data into PC main memory where scan conversion is performed per software.
Cine Mode: Reserved area in PC main memory is used.

2.) BF128 (Voluson® S8) or BF64 (Voluson® S6)

This Beamformer board consists of Bemaformer-FPGA, TX-pulser, RX-AFE. BF128 supports 128 TX/RX channels, and BF64 supports 64 TX/RX channels. beamformer-FPGA generates TX-Frequency through dividing 200MHz by 2,3,4,5,..., TX-Focus, and Sampling Clocks for the ADC, and manages RX-Foxcus (Delay and Chain-Adder) and Apodization.

5-2-3-1-1 Special B-Mode Techniques

a.) **HI** (Coded Harmonic Imaging):
In one method of HI the RX-Frequency is doubled, so that the radial resolution is increased due to the higher RX-Frequency.
The second method of HI is pulse-inversion: 2 TX-Beams are shot to the same Tissue-location, one with positive, one with negative polarity. The subtraction of both shots (Subtraction Filter) brings to bear the nonlinear-echo-reflection-properties of the tissue (especially in usage of Contrast-medias), which is very useful with extremely difficult-to-image patients.

b.) FFC (Frequency and Focus Composite):
2 or more TX-Beams are shot to the same Tissue-location. The Beams have different TX-foci. By means of Blending (adaption of Brightnesses) they are composed to one whole RX-Line.

c.) XBEAM CRI (CrossBeam - Compound Resolution Imaging):
Does not need any special functions of RFS.
Image is composed of more than one different-direction-steered images. PC-calculated.

d.) VCI (Volume Contrast Imaging): Does not need any special functions of RFS.
Image is composed of more than 2 small angle neighbored images. PC-calculated.
(Only possible with 4D-Probes).

5-2-3-2 M-Mode

1.) RFS

see: Section 5-2-3-1 "B-Mode" on page 5-12

a.) DMA section

B-mode-Data is written via SP0 into SDRAM Fifo Buffer memory. DMA Controller 1 transfers the data into SOM (System-On-Module) main memory where scan conversion is performed per software, i.e. the sweep image is generated (scaling and interpolation between lines).
CineMode: CineMode-Memory is the SOM main memory.

5-2-3-3 D-Mode (Pulsed Wave- and Continuous Wave Doppler)

1.) RFS

- PRF-generator; see: Section 5-2-3-1 "B-Mode" on page 5-12
- After DC-cancelling the signal is mixed with RX-Frequency and brought to LF-Spectrum, where the LowPassFilter cuts HF.
  Mixer and Magnitude-Calculator arrange Complex Demodulation.

a.) DMA section

D-mode-Data is written via SP0 into SDRAM Fifo Buffer memory. DMA Controller 1 transfers the data into PC main memory where FFT and scan conversion is performed per software, i.e. the sweep image is generated (scaling and interpolation between lines).
CineMode: CineMode-Memory is the SOM main memory.

5-2-3-4 D-Mode Autotrace (draws PC-calculated envelope to D-Spectrum)

1.) RFS

- PRF-generator; see: Section 5-2-3-1 "B-Mode" on page 5-12
- After DC-cancelling the signal is mixed with RX-Frequency and brought to LF-Spectrum, where the LowPassFilter cuts HF.
  Mixer and Magnitude-Calculator arrange Complex Demodulation.

a.) DMA section

D-mode-Data is written via SP0 into SDRAM Fifo Buffer memory.
PC calculates Autotrace-Curve from D-Mode data.
Cine Mode with Autotrace: Cine Mode-Memory for the Autotrace-Curve is inside SOM-Memory.
Software has to take care that D-Spectrum and Autotrace-Curve are placed exactly one upon the other, means: have the same Cine-Shift.

5-2-3-5 CFM-Mode (Color Flow Mode)

1.) RFS

- PRF-generator; see: Section 5-2-3-1 "B-Mode" on page 5-12
- After DC-cancelling the signal is mixed with RX-Frequency and brought to LF-Spectrum, where the LowPassFilter cuts HF.
  Mixer and Magnitude-Calculator arrange Complex Demodulation.

5-2-3-6 3D-Mode (Freezes after 1 volume sweep)

see: Section 5-2-3-1 "B-Mode" on page 5-12

5-2-3-7 Real Time 4D-Mode (nonstop volume rendering)

see: Section 5-2-3-1 "B-Mode" on page 5-12

5-2-3-8 XBeam CRI-Mode (CrossBeam Compound Resolution Imaging)

see: Section 5-2-3-1 "B-Mode" on page 5-12

5-2-3-9 VCI-Mode (Volume Contrast Imaging)

see: Section 5-2-3-1 "B-Mode" on page 5-12

5-2-3-10 Archive write mode (store Image to Archive)

1.) RFS

Not used

5-2-4 Description of Software Options

To activate the software options:

1.) Press the **UTIL** button on the OPIO.
2.) On the left side of the screen select SYSTEM SETUP to activate the setup desktop screen.
3.) On the left side of the screen select ADMINISTRATION and then click the **OPTIONS** tab.

Table 5-2 Software Options

SW-Option	Description	Voluson® S8 EMEA	Voluson® S8 LA	Voluson® S8 USA/CAN	Voluson® S8 Japan	Voluson® S8 India	Voluson® S8 APAC	Voluson® S6 EMEA	Voluson® S6 LA	Voluson® S6 IVF	Voluson® S6 USA/CAN	Voluson® S6 ARM	Voluson® S6 Japan	Voluson® S6 India	Voluson® S6 APAC
3D/4D Advanced	5-2-4-1 3D/4D Advanced	N/A	N/A	N/A	N/A	N/A	N/A	X	S	S	S	S	X	S	S
3D/4D Expert	5-2-4-2 3D/4D Expert	X	S	S	X	S	S	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Advanced VCI	5-2-4-3 Advanced VCI	X	S	X	X	S	S	X	X	X	N/A	N/A	X	S	S
DICOM	5-2-4-4 DICOM	X	S	S	X	S	S	X	X	X	S	S	X	S	S
B-Flow	5-2-4-5 B-Flow	X	S	X	X	X	X	X	S	X	N/A	N/A	X	X	X
Elastography	5-2-4-6 Elastography	X	X	X*	X	S	S	X	X	X	N/A	N/A	X	N/A	S
Coded Contrast Imaging	5-2-4-7 Coded Contrast Imaging	X	X	N/A	X	X	X	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SonoVCAD Heart	5-2-4-8 SonoVCAD Heart-Computer Assisted Heart Diagnosis Package	X	X	X	X	S	X	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SonoAVC follicle	5-2-4-9 SonoAVC follicle - Sono Automated Volume Count	X	X	X	X	S	X	X	N/A	S	N/A	S	X	N/A	X
SonoVCAD labor	5-2-4-10 SonoVCAD labor	X	X	X	X	X	X	X	N/A	N/A	X	X	X	N/A	X
Anatomical M-Mode	5-2-4-11 Anatomical M-Mode (AMM)	X	X	X	X	S	S	X	X	X	N/A	N/A	X	S	X
Advanced SRI (SRI II)	5-2-4-12 Advanced SRI	S	S	S	S	S	S	X	S	X	S	S	X	S	S
SonoNT	5-2-4-13 SonoNT	S	S	X	X	S	S	S	S	S	X**	N/A	X	S	S
STIC	5-2-4-14 STIC	X	X	X	X	S	S	X	X	N/A	N/A	N/A	X	S	X
ScanAssistant	5-2-4-15 ScanAssistant	S	S	X	S	S	S	S	S	S	X	X	S	S	S

Legend: X = Optional Feature (separately purchasable) S = Standard Feature N/A = Not available
X* - USA Not available Elastography on Voluson® S6 and Voluson® S8
X** - USA Not available SonoNT on Voluson® S6

5-2-4-1 3D/4D Advanced

5-2-4-1-1 Real Time 4D

Real Time 4D mode is obtained through continuous volume acquisition and parallel calculation of 3D rendered images. In Real Time 4D mode the volume acquisition box is at the same time the render box. All information in the volume box is used for the render process. In Real Time 4D mode a “frame rate” of up 40 volumes/second is possible. By freezing the acquired volumes, size can be adjusted, manipulated manually as known from the Voluson 3D Mode

5-2-4-2 3D/4D Expert

5-2-4-2-1 Real Time 4D

Real Time 4D mode is obtained through continuous volume acquisition and parallel calculation of 3D rendered images. In Real Time 4D mode the volume acquisition box is at the same time the render box. All information in the volume box is used for the render process. In Real Time 4D mode a “frame rate” of up 40 volumes/second is possible. By freezing the acquired volumes, size can be adjusted, manipulated manually as known from the Voluson 3D Mode.

5-2-4-2-2 Real Time 4D Biopsy

For minimal invasive procedures like biopsies, ultrasound is a widely used method to visualize and guide the needle during puncture. The advantage in comparison with other imaging methods is the real-time display, quick availability and easy access to any desired region of the patient. 4D biopsy allows for real time control of the biopsy needle in 3D multi-planar display during the puncture.
The user is able to see the region of interest in three perpendicular planes (longitudinal, transversal and frontal section) and can guide the biopsy needle accurately into the centre of the lesion.

5-2-4-2-3 VCI - Volume Contrast Imaging

Volume Contrast Imaging utilizes 4D transducers to automatically scan multiple adjacent slices and delivers a real-time display of the ROI.
This image results from a special rendering mode consisting of texture and transparency information. VCI improves the contrast resolution and therefore facilitates finding of diffuse lesions in organs. VCI has more information (from multiple slices) and is of advantage in gaining contrast due to improved signal/noise ratio.

Static VCI is a part of the VCI option, which allow to apply the contrast enhancing VCI method to 3D data sets after the acquisition.

5-2-4-2-4 T.U.I. - Tomographic Ultrasound Imaging

TUI is a new visualization mode for 3D and 4D data sets. The data is presented as slices through the data set which are parallel to each other. An overview image, which is orthogonal to the parallel slices, shows which parts of the volume are displayed in the parallel planes.
This method of visualization is consistent with the way other medical systems such as CT or MRI, present the data to the user. The distance between the different planes can be adjusted to the requirements of the given data set. In addition it is possible to set the number of planes.
The planes and the overview image can also be printed to a DICOM printer, for easier comparison of the ultrasound data with CT and/or MRI data.

5-2-4-3 Advanced VCI

5-2-4-3-1 VCI Omni View - Volume Contrast Imaging (any plane)

More flexibility with Any Plane, VCI plane is freely selectable. Any shape can be drawn.

- Volumes can be edited in all other Visualization Modes.
- Dual Format is now also possible in Render Mode and Sectional Planes Mode.

- VCI slice thickness can be set to zero.

5-2-4-4 DICOM

Software package providing following DICOM functionality:

- Storage Service Class
- Print Management Service Class
- Structured Reporting Service Class
- Storage Commit Service Class
- Modality Performed Procedure Step Service Class

Sending of reports - Additionally all OB/Gyn measurements can be sent to a PC*.
Receiving of these reports is supported by ViewPoint workstation “PIA” only. All other workstations can be adapted individually.

* Without using structured reporting.

5-2-4-5 B-Flow

B-Flow is especially intuitive when viewing blood flow, for acute thrombosis, parenchymal flow and jets. It helps to visualize complex hemodynamics and highlights moving blood in tissue.
B-Flow is less angle dependent, no velocity aliasing artifacts, displays a full field of view and provides better resolution when compared with Color-Doppler Mode. It is therefore a more realistic (intuitive) representation of flow information, allowing to view both high and low velocity flow at the same time.

5-2-4-6 Elastography

Elastography refers to the measurement of elastic properties of tissues, based on the well-established principle that malignant tissue is harder than benign tissue.

Elastography shows the spatial distribution of tissue elasticity properties in a region of interest by estimating the strain before and after tissue distortion caused by external or internal forces. The strain estimation is filtered and scaled to provide a smooth presentation when displayed.

During scanning in the elastography mode, the examiner manually slightly compresses the tissue using the ultrasound probe. A strain correlation (strain is the deformation of the tissue by compression) is continuously performed for visual perception on the monitor.

5-2-4-7 Coded Contrast Imaging

Injected contrast agents re-emit incident acoustic energy at a harmonic frequency much more efficiently than the surrounding tissue. Blood containing the contrast agent stands out brightly against a dark background of normal tissue.
Possible clinical uses are to detect and characterize tumors of the liver, kidney and pancreas and to enhance flow signals in the determination of stenosis or thrombus.

5-2-4-8 SonoVCAD Heart- Computer Assisted Heart Diagnosis Package

VCAD is a technology that automatically generates a number of views of the fetal heart to make diagnosis easier. At this time it can help to find the right and left outflow tract of the heart and the fetal stomach.

5-2-4-9 SonoAVC follicle - Sono Automated Volume Count

This Feature can automatically detect follicles in a volume of an organ (e.g., ovary) and analyze their shape and volume. From the calculated volume an average diameter can be calculated. It also lists the objects according to their size.

- Each object can be calculated automatically.
- A description name can be defined for each object up to 10 descriptions. With the “Add to Report”

button all values of the measured objects can be sent to the worksheet. Also the description name will be sent.

- The description name can be edited in the worksheet.
- If the number button is activated, all objects are assigned a number inside the displayed object according to the measurement index.
- Group function: All objects will be added to one volume.
  The color of all objects will be changed to red and the measurement will show only one result.

5-2-4-10 SonoVCAD labor

Allows the user to measure fetal progression during the second stage of labor – fetal head progression, rotation and direction. Visual evidence and objective data of the labor process are provided.

All SonoVCAD labor measurements (Head direction, Midline Angle, Progression Distance, Progression Angle and associated acquisition time) are automatically added to the worksheet, as soon as they are performed. Only one measurement result is available for each measurement type. If the measurement is repeated, the old result is replaced by the new result.

If a volume is deleted, the according measurements are not deleted from the worksheet.

SonoVCAD labor measurement data can be transferred via DICOM SR.

5-2-4-11 Anatomical M-Mode (AMM)

Anatomical M-Mode displays a distance/time plot from a cursor line, which can be defined freely.
The M-Mode display changes according to the motion of the M cursor. In the Dual format, two defined distances can be displayed at the same time.

AMM is available in grayscale and color modes (CF, HD Flow, TD)

- simultanous Display of 2 M-Mode Cursors in 2D Mode
- each Cursor is freely rotatable
- can be done after Freeze and on reloaded Cine

5-2-4-12 Advanced SRI

A type of image noise or interference is generally considered undesirable and can obscure the quality or interpretation of B-mode images. Although somewhat associated with the underlying echogenicity of tissue scatters, image speckle characteristics such as brightness, density or size have no apparent value in determining tissue structure or related properties. The elimination of or significant reduction in speckle improves the quality or diagnostic potential of the image.

The method applied in the subject modification utilizes a nonlinear diffusion filtering technique that permits effective speckle reduction in real time. The speckle reduction filter is available to the user in all B-mode imaging, independent of the transducer used.

5-2-4-13 SonoNT

SonoNT is an additional function for manual NT (Nuchal Translucency) measurement. This function supports the user to find the correct position for the NT measurement. The user can switch between NT Method “Manual” and “Sono NT” (semi-automatic).

A Box has to be placed for the NT-ROI. Then the NT-distance is calculated automatically, a graphic (yellow head-image) and the NT-result are displayed.

If no result is found a temporary warning “No valid NT-distance found!” is displayed.

5-2-4-14 STIC

With this acquisition method the fetal heart or an artery can be visualized in 4D. It is not a Real Time 4D technique, but a post processed 3D acquisition.

In order to archive a good result, try to adjust the size of the volume box and the sweep angle to be as small as possible. The longer the acquisition time, the better the spatial resolution will be. A good STIC, STIC CFM (2D+CFM), STIC PD (2D+PD) or STIC HD (2D+HD-Flow) data set shows a regular and synchronous pumping of the fetal heart or of an artery.

The user must be sure that there is minimal movement of the participating persons (e.g., mother and fetus), and that the probe is held absolutely still throughout the acquisition period. Movement will cause a failure of the acquisition. The acquired images are post processed to calculate a 4D Volume Cine sequence. Please make sure that the borders of the fetal heart or the artery are smooth and there are no sudden discontinuities. If the user (trained operator) clearly recognizes a disturbance during the acquisition period, the acquisition has to be cancelled.

- STIC - Fetal Cardio is only available on RAB & RIC probes in the OB/GYN application.
- STIC - Vascular is only available on the RSP probe in the Peripheral Vascular application.

5-2-4-15 ScanAssistant

All major ultrasound societies (SMFM, AIUM, ACR, ACOG) have guidelines to be followed for each examination. For legal reasons, documentation is recommended for all structures evaluated.

Scan Assistant prevents the user from missing an important step of an examination. Completely customizable, each exam can have sub menus that allow measurements and annotations to be tagged for transfer with DICOM and DICOM SR.

5-2-5 Description of Hardware Options

Table 5-3 Hardware Options

	HW-Options	Description
1	DVR Recorder	5-2-5-1 DVR Recorder
2	WLAN Network Adapter	5-2-5-2 Wireless Network Adapter (WLAN - Wireless Local Area Network)
3	Scan/Freeze Footswitch	5-2-5-3 Scan/Freeze Footswitch

5-2-5-1 DVR Recorder

For details see: Section 5-9-1-1 "DVD Recorder" on page 5-36

5-2-5-2 Wireless Network Adapter (WLAN - Wireless Local Area Network)

For details see: Section 5-9-4 "Wireless Network Adapter" on page 5-36

5-2-5-3 Scan/Freeze Footswitch

For details see: Section 5-9-5 "Footswitch" on page 5-36

5-2-6 Data Location

The Voluson® S8 / Voluson® S6 has a 160 Gbyte Hard disk divided into 4 partitions:

C: System partition:

- Operating System (Windows XP) including all Windows settings (IP-address, Network Name, etc.)
- US-Application Software (UISAPP)
- Global Service Platform Software
- Software Options

D: User partition:

- User Presets (Backup) database
- Images (Archive), Patient-ID´s and Reports database
- Service database
- System settings database

R: Rescue partition:

- Factory Images of C:Partition for System recovery after HDD (Windows) crash
- Printer Drivers

LINUX partition: (not visible in Windows)

- Linux operating system for rescue functionality

Figure 5-5 Data Location - distribution of partitions

Section 5-3
FrontEnd Processor

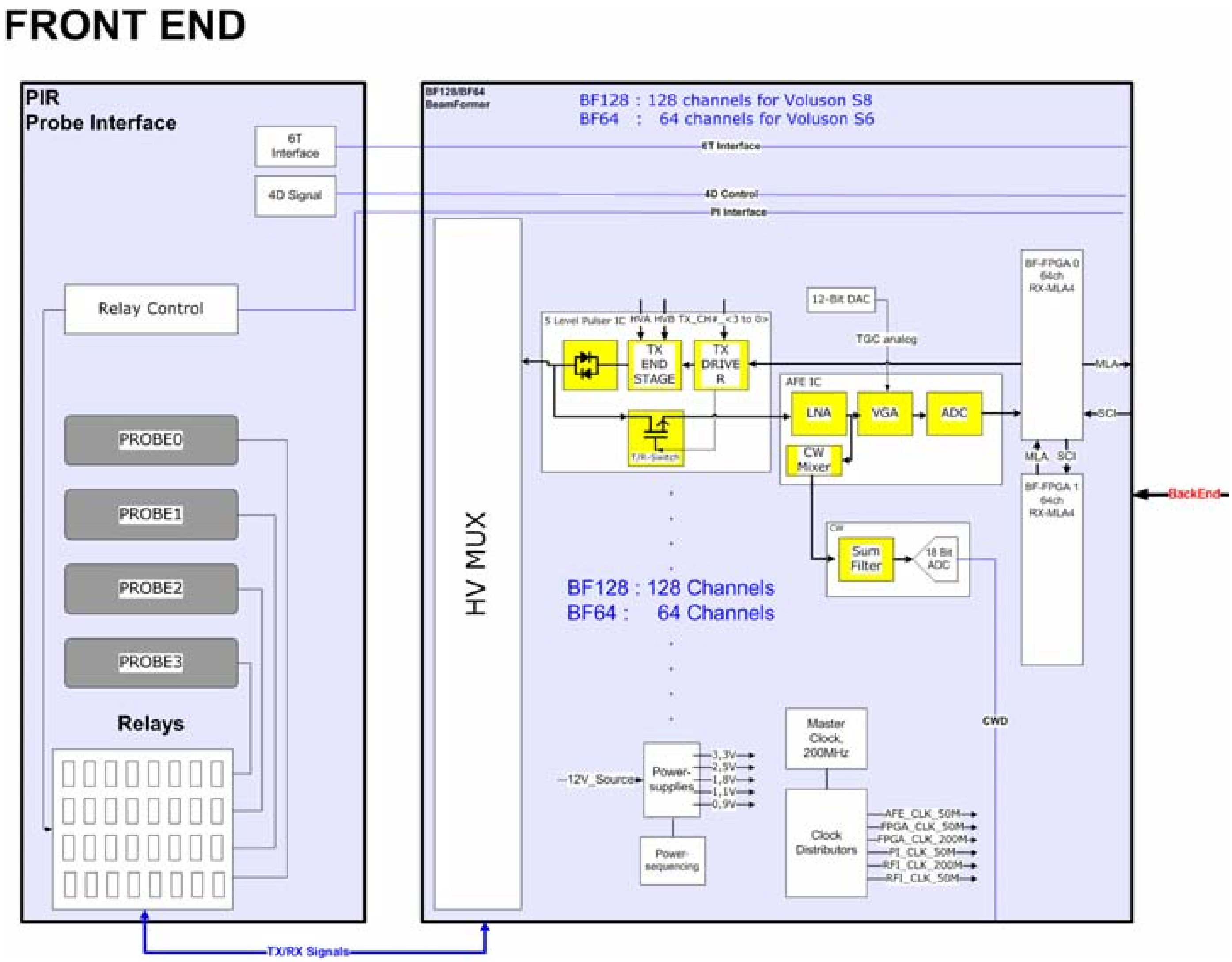


Figure 5-6 Front End Processor - Block diagram

Table 5-4 below outlines the Voluson® S8 / Voluson® S6 Front End components described in the sub-sections.

Table 5-4 Voluson® S8 / Voluson® S6 - Front End components

Sub-section	Description	Page Number
5-3-1	PIR - Probe Interface board	5-22
5-3-2	BF128 / BF64 - Beam former board	5-23
5-3-3	RFS - Radio Frequency interface and System controller	5-24

5-3-1 PIR - Probe Interface board

Switches the Probe Connectors (3 RS -Connectors) and recognizes Probes

- 3 RS-Probe Connectors
- 1 RS-Dummy Probe Connector
- Probe Select Relays
- Probe Recognition

For Block diagrams refer to:

- *Figure 5-7: PIR - Blockdiagram*

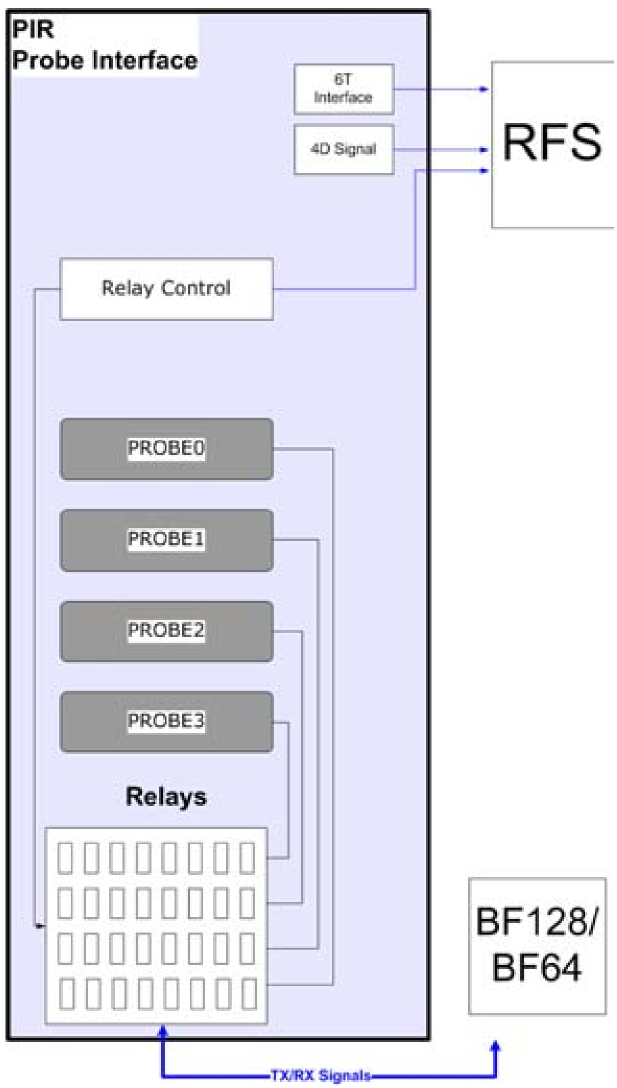


Figure 5-7 PIR - Blockdiagram

5-3-2 BF128 / BF64 - Beam former board

BF128 or BF64 board has 128 TX/RX channels or 64 TX/RX channels, respectively. beamformer board is a complete 128 or 64 channel ultrasound Front-end that includes the following features and functions:.

- TX-pulse genetration, TX-Apodization, TX-Focus
- RX-Focus Delay and summation
- Full receiving channel with integrated AFE IC: TGC + Anti-Aliasing Filter + ADC
- High Voltage Multiplexer, 192 x 128 channels (BF128), 192 x 64 channels (BF64)

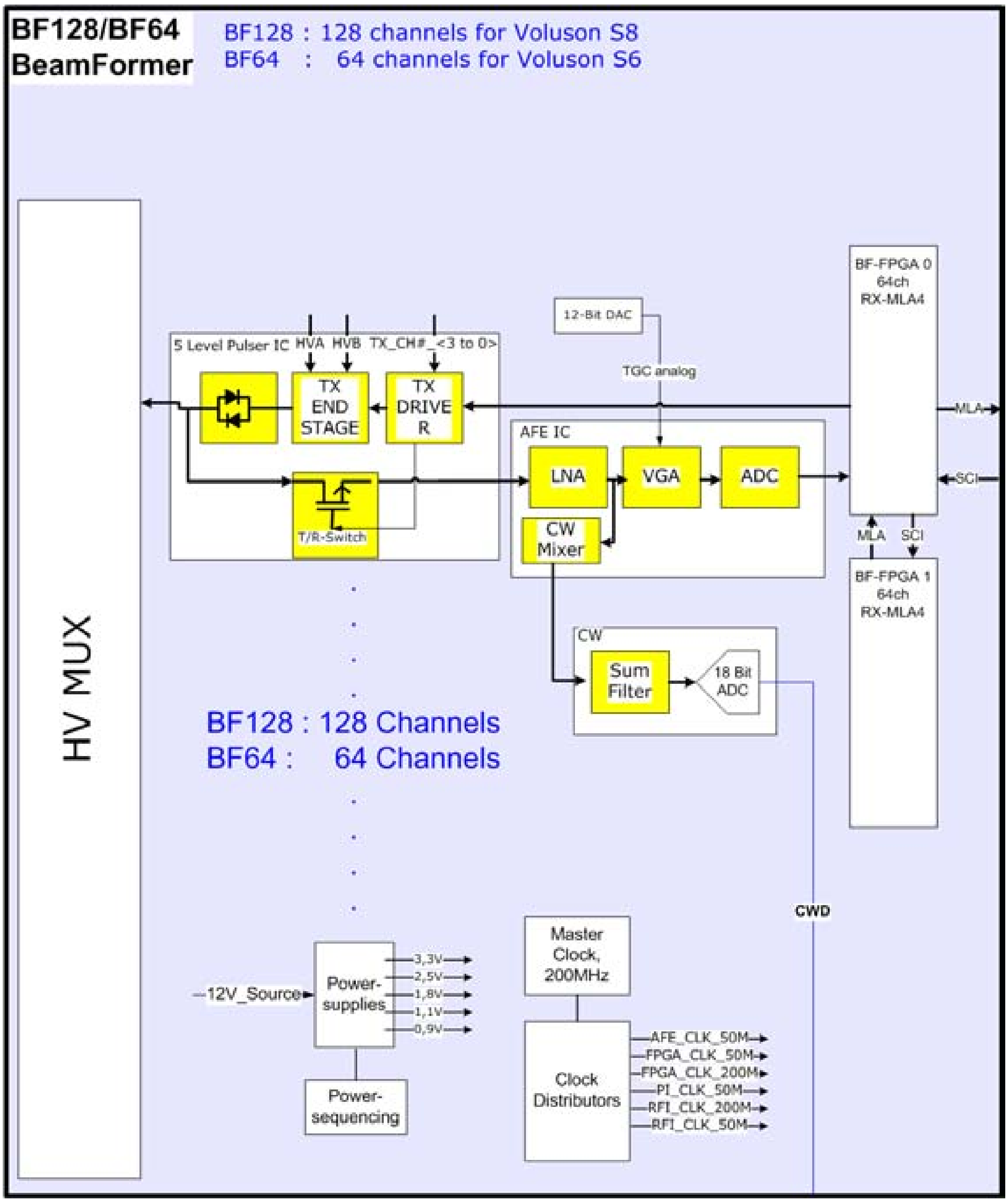


Figure 5-8 Beamformer + Frontend

5-3-3 RFS - Radio Frequency interface and System controller

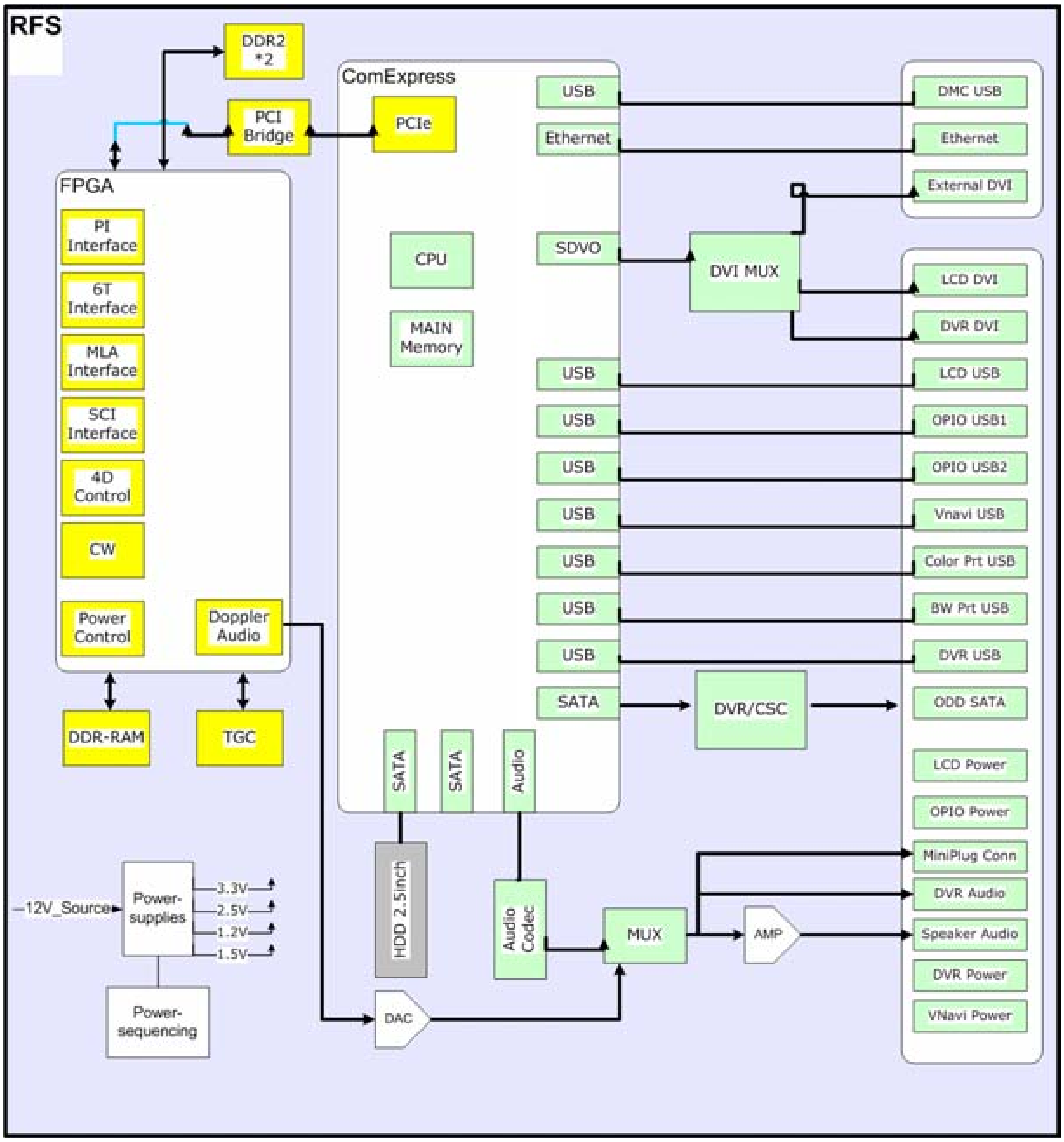


Figure 5-9 RFS-Board - Block diagram

5-3-3-1 RFS board - FPGA

A.) Beamformer interface

- LVDS-interface
- Raw ultrasound data is transferred from the Beamformer to the Interface FPGA.
- Configuration data (Probe Setup data, Beam Setup data) is transferred from the Interface FPGA to the Beamformer.
- FPGA configuration data is transferred from the Interface FPGA to the Beamformer

B.) DMA Logic

- Receives pre-processed ultrasound data coming from the Processing FPGA.

- Stores this data in the Line Memory buffer (2x SDRAM)
- Transfers buffered data by DMA-transfer via PCI and PCI-Express to the PC
  - Non-TimeMotion data (B, C): DMA0
  - TimeMotion data (M, PW): DMA1.

C.) PIR FPGA programming interface

- This FPGA is the interface between the scanner connectors and the RFS-board.

D.) Ultrasound Data Pre-processing

- Raw ultrasound data is coming in from the Interface FPGA. It is pre-processed.Further processing will be done by the PC. The pre-processed data is transferred back to the Interface-FPGA.

E.) System control

- PRF (Pulse Repetition Frequency) Generator
- Line Number (Lateral Position)
- Control of TX-Power DACs (generation of TX POWER reference voltage)
- Controls discharge of capacity on CPS board during the reduction of TX POWER
- Shut-down signal coming from the BF128/BF64 board is passed to the SOM
- Probe Select signals, which indicate that a probe is connected to a probe connector.
- Probe Code Interface: The Probe Code can be read from a connected probe, or a new code can be written into the probe..
- Audio Control:
  - PW Doppler Audio Output for buffered signals from the PC

F.) 4D motor control

- Master of Control for 3D-Sweep
- Master of Control for 4D-Sweeps
- Generation of Volume Trigger and Frame Trigger (for 4D)
- Drives motor (in 3D/4D-probes) via SIN (sine-signal) & COS (cosine signal)
- The HALL-signal coming from the 3D/4D probe is passed to the DSP for zero position detection.

Section 5-4
BackEnd Processor

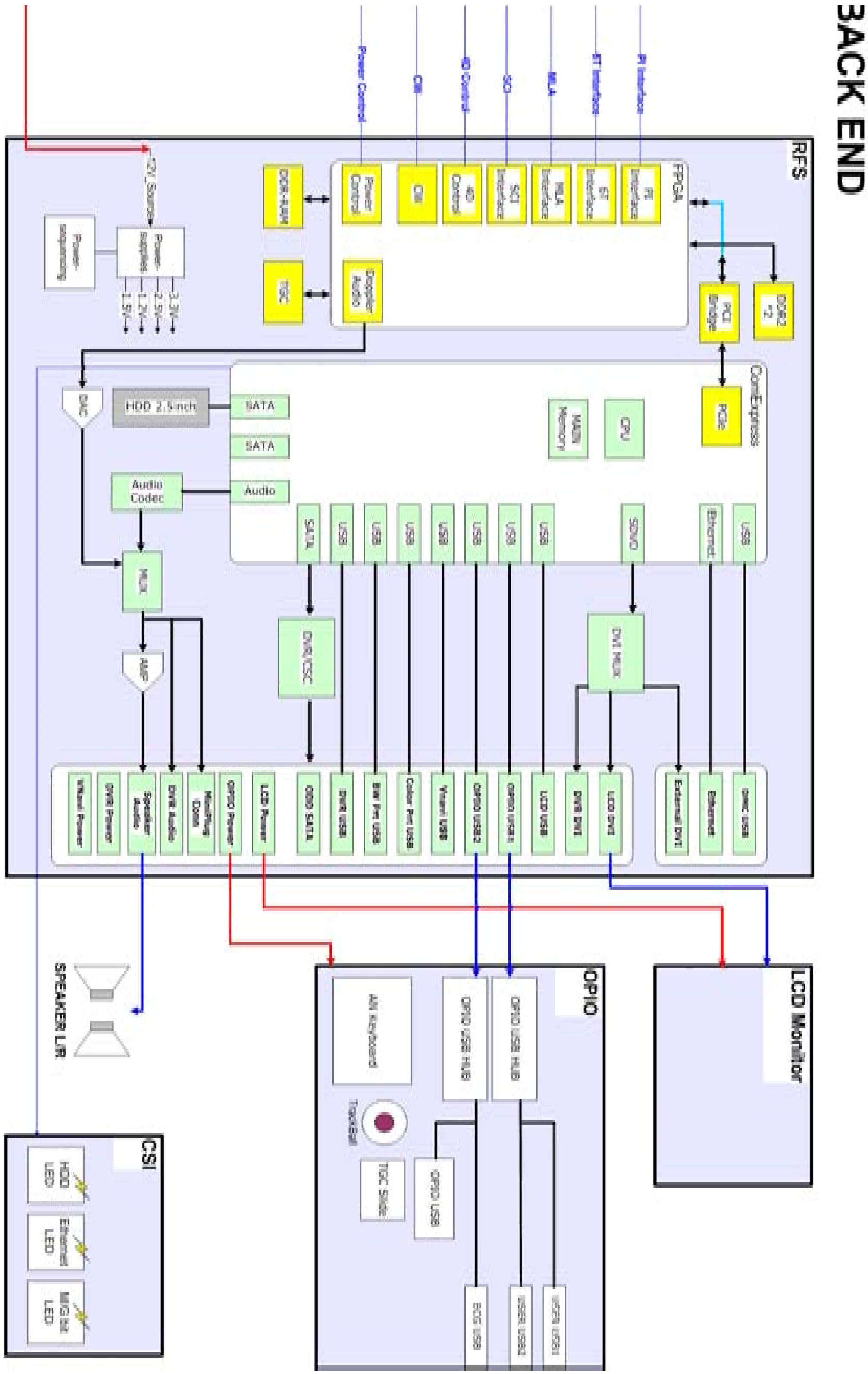


Figure 5-10   BackEnd Processor - Block diagram

Table 5-5 Voluson® S8 / Voluson® S6 - RFS components

5-4-1 Hard Disk Drive

The Hard Disk is the main storage device of the Voluson® S8 / Voluson® S6 ultrasound system. The Voluson® S8 / Voluson® S6 160 Gbyte Hard disk, which is controlled by the CPU via signals from SATA, is divided into 4 partitions.

For further details see: Section 5-2-6 "Data Location" on page 5-20.

5-4-2 SOM (System On Module)

5-4-2-1 Congatec

Built in or external Components:

- On Board VGA, LAN, USB 2.0, Sound
- CPU: Intel® Core™ 2 Duo Processor T9400, 2.53 GHz

Major Tasks:

- System Control
- 2D- / 3D- / 4D- Image processing and Rendering

- Control DVD drive (SATA), User Interface (USB), DVR (USB)

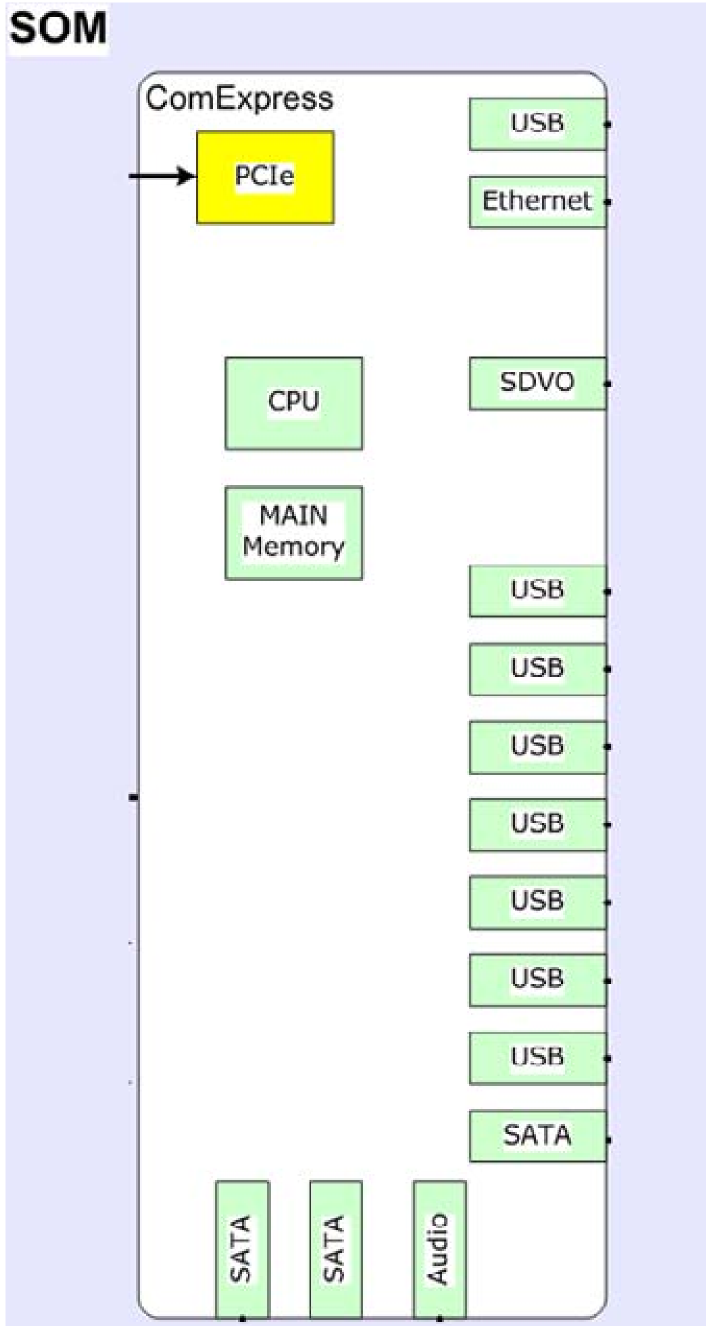


Figure 5-11 SOM (System On Module)

5-4-3 DVR - Digital Video Recorder (option)

For further details see: Section 5-9-1-1 "DVD Recorder" on page 5-36.

Section 5-5
Internal I/O

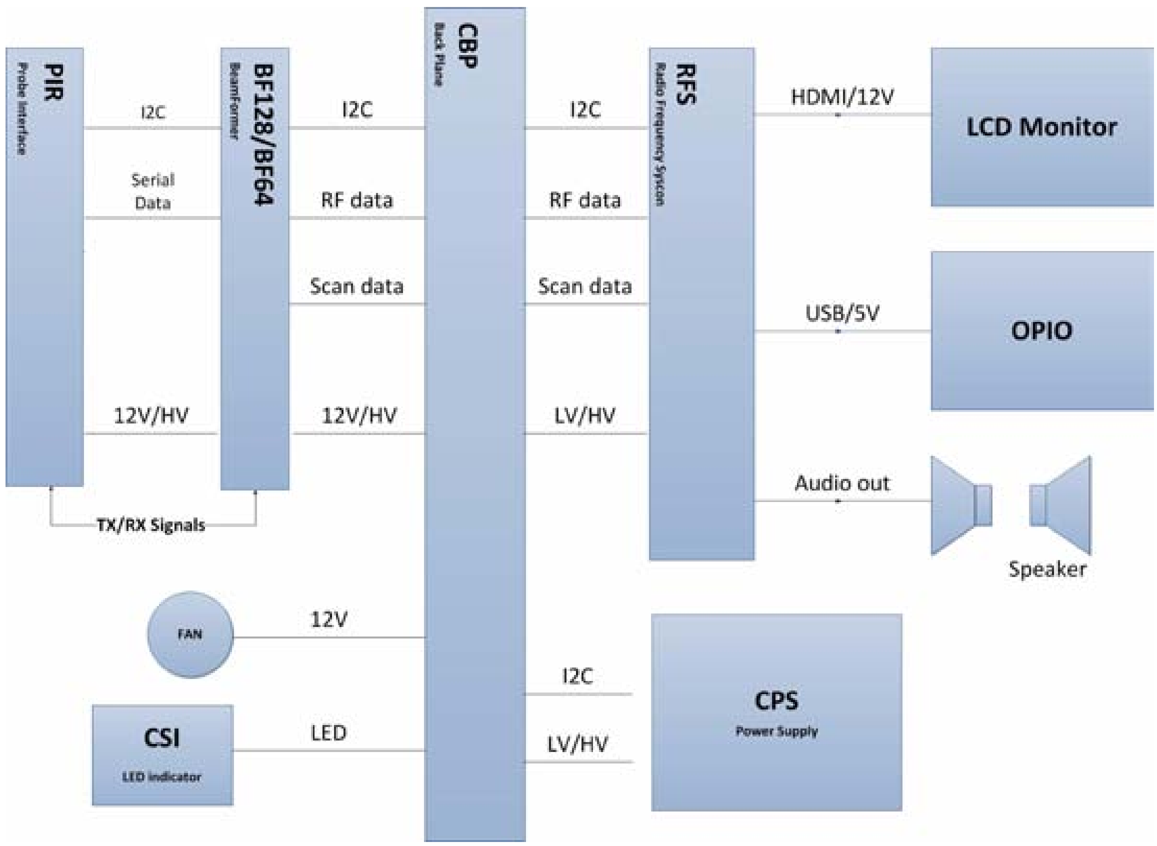


Figure 5-12   Voluson® E6 /Voluson® E8: Internal I/O

Section 5-6
OPIO (User Interface)

5-6-1 OPIO Block Diagram

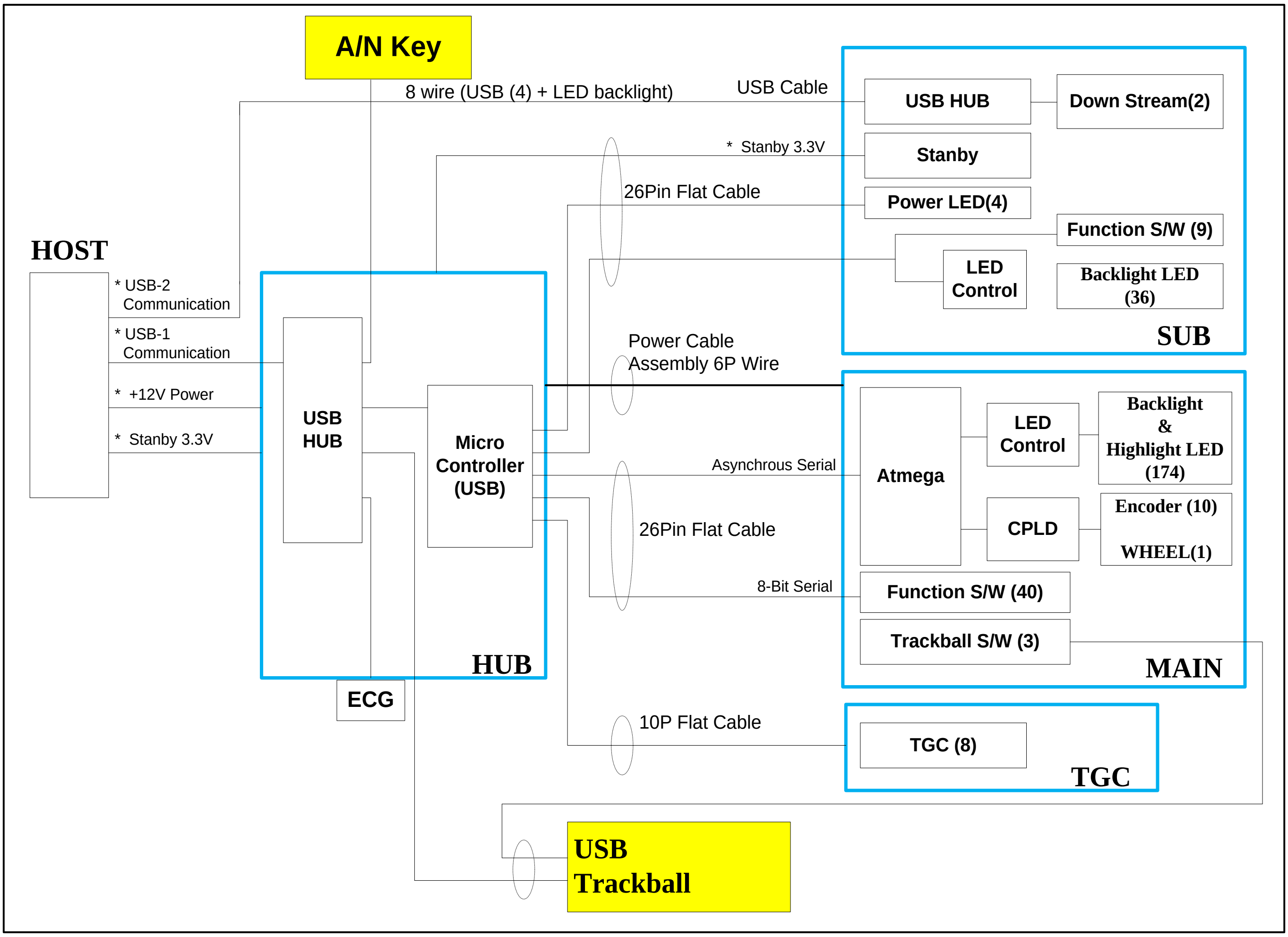


Figure 5-13 Main OPIO - Block Diagram

The Voluson® S8 / Voluson® S6 OPIO (User Interface) consists of the following electronic subassemblies and/or functional components:

- Upper Keyboard OPIO:
  - Power ON/OFF control
  - 2 USB2.0 ports
  - Configurable 9 buttons
- Lower Keyboard OPIO:
  - 4 port USB 2.0 Hub controller
  - Slide pots TGC with zero raster position
  - Rotary Encoders with integrated push buttons
  - USB Trackball (2”) with dedicated buttons to emulate standard three button mouse
  - USB standard alphanumeric keyboard
  - LED Indicators with wide range dimming

5-6-2 OPIO layout

Figure 5-14 Voluson® S8 / Voluson® S6 - OPIO Layout

Table 5-6 Voluson® S8 / Voluson® S6 - key codes

key code	Description	Voluson® S8 / Voluson® S6 - Functionality	X	X	X
1	Power/Standby ON/OFF	On/Off switch of the system			
2	Patient Data (PID)	Call-up of the patient data entry menu and/or patient archive			
3	Probe	Call-up of the probe program menu			
4	Report	Call-up of the Patient report page			

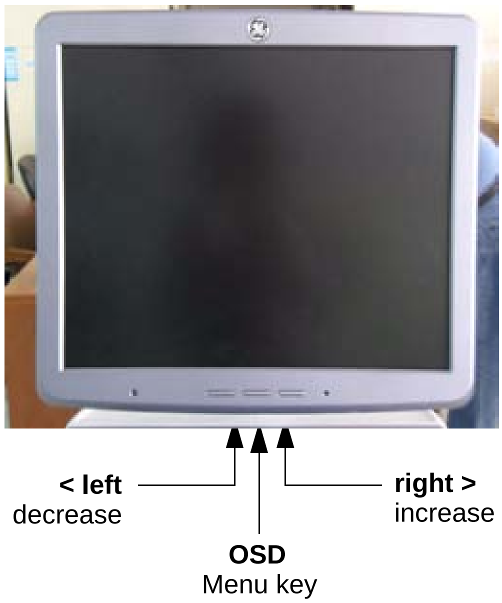
Table 5-6 Voluson® S8 / Voluson® S6 - key codes

key code	Description	Voluson® S8 / Voluson® S6 - Functionality	X	X	X
5	Archive				
6	End Exam	Patient and measurment data are stored in the “Data manager”			
7	Reserved				
8	Reserved				
9	Utility	Call-up the Utilities menu			
10	DVR	Call-up the DVR menu			
11	Contrast	Invoke Contart Imaging function			
12	Elastography	Invoke Elastography function			
13	Acquisition Mode XTD	invokes XTD-View (Extended View) function			
14	HI	(Coded) Harmonic Imaging			
15	Steer	Steer			
16	Init	Rest to intilaize position in volume mode			
17	label illuminated: Power (Probe)	Acoustic Output (Ultrasound emission of a probe)			
18	label illuminated: Power (Speaker)	Acoustic Output (Speakers)			
19	Bodymark	Bodymark display - to enter Bodymark symbols			
20	ABC (Text)	Image Annotation - to write onto the screen			
21	Trackball pointer	displays a pointer (arrow or hand shaped cursor)			
22	Exit	Exit current menu			
23	Clear	to clear graphics, measurements and annotations on the screen			
24	Caliper	Generic Measurements			
25	Calc	Calculation (tables)			
26	Acquisition Mode 4D	invokes Real Time 4D Mode (continuos volume sweep)			
27	Acquisition Mode 3D	invokes 3D Volume Mode			
28	label illuminated: HR-Zoom	image magnification of selected image area			
29	label illuminated: Pan Zoom	image magnification of complete image			
30	Depth (Toggle) switch	Penetration Depth UP - Toggle switch function			
31	Depth (Toggle) switch	Penetration Depth DOWN - Toggle switch function			
32	Focus Depth (Toggle) switch	Focus Depth UP - Toggle switch function			
33	Focus Depth (Toggle) switch	Focus Depth DOWN - Toggle switch function			
34	Auto (OTO)	Automatic Optimization			
35	Dual Format (V)	Dual-Screen format (vertical distribution)			
36	Quad Format	Quad-Screen format			
37	Single Format	Single-Screen format			
38	P1	programmable key			
39	P2	programmable key			
40	P3	programmable key			
41	P4	programmable key			
42	Freeze	Read/Write (Freeze/Run)			
43	Encoder PW-Mode	PW-Mode (Pulsed Wave Doppler)			
44	Encoder M-Mode	M-Mode (Motion Mode)			
45	Encoder PD-Mode	PD-Mode (Power Doppler) and HD-Mode (Bi-Directional Angio)			
46	Encoder CF-Mode	C-Mode (Color Flow Mode)			
47	Encoder 2D-Mode	2D-Mode (B-Mode)			
48	label illuminated: X	Volume Mode icon (rotation about X-axis)			
49	label illuminated: Y	Volume Mode icon (rotation about Y-axis)			

Table 5-6 Voluson® S8 / Voluson® S6 - key codes

key code	Description	Voluson® S8 / Voluson® S6 - Functionality	X	X	X
50	label illuminated: Z	Volume Mode icon (rotation about Z-axis)			
51	label illuminated	Volume Mode icon (movement along Z-axis)			
52	Encoder 1	function depends on currently selected mode			
53	Encoder 2	function depends on currently selected mode			
54	Encoder 3	function depends on currently selected mode			
55	Paddle (Toggle) switch	UP - Toggle switch (function depends on currently selected mode)			
56	Paddle (Toggle) switch	DOWN - Toggle switch (function depends on currently selected mode)			
57	Paddle (Toggle) switch	UP - Toggle switch (function depends on currently selected mode)			
58	Paddle (Toggle) switch	DOWN - Toggle switch (function depends on currently selected mode)			
59	Trackball button	left trackball key			
60	Trackball button	upper trackball key			
61	Trackball button	right trackball key			
62	Trackball Mode switch	function depends on currently selected mode			
63	Trackball Mode switch	function depends on currently selected mode			
64	Trackball Mode switch	function depends on currently selected mode			
65	Slider 1~8	TGC Slider Control			
66	OPIO Rotate	Rotation of the OPIO (User Interface)			
67	OPIO Height Adjust	Height Adjustment of the OPIO (User Interface)			
68	Acquisition Mode BF	Invoke B-Flow function			
69	Acquisition Mode CW	Invoke CW function			
70	Mirror	left/right image orientation			
71	Up/Down	up/down image orientation			
72	Menu Selector (Wheel Switch)	Menu Navigation Wheel			

Section 5-7
Monitor



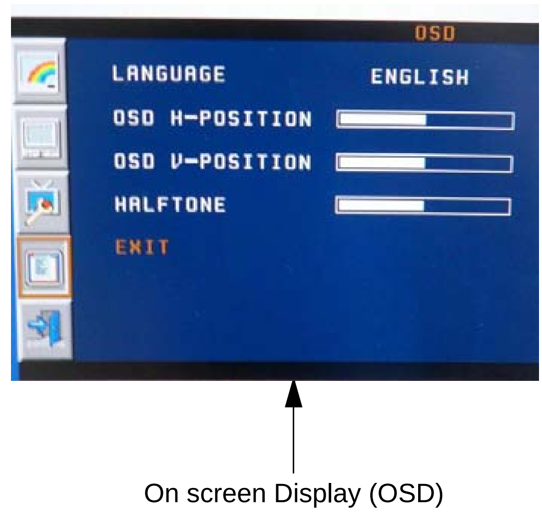


Figure 5-15 Monitor Adjustment buttons

- **Menu key [OSD](**Press the OSD (middle) key of the monitor controls over 10 sec.)**:**
  This button will enable the On Screen Display to modify the settings and control the special features. To select a tab use the [LEFT] and [RIGHT] button and then press the OSD button again.
- **Decrease < [LEFT]:**
  Use this button to move down the OSD selection menu and adjust the attribute of the monitor while in OSD mode. Pressing this button out of the OSD menu allows you to decrease the level of brightness/contrast of the display screen.
- **Increase > [RIGHT]:**
  Use this button to move up the OSD selection menu and adjust the attribute of the monitor while in OSD mode. Pressing this button out of the OSD menu allows you to increase the level of brightness/contrast of the display screen.

NOTE: All changed values will only be saved by selecting “Exit” from the OSD. If not, the adjusted values will be lost after loss of power.

For further details refer to: Section 6-3 "LCD Monitor Adjustment" on page 6-2.

Section 5-8
External I/O

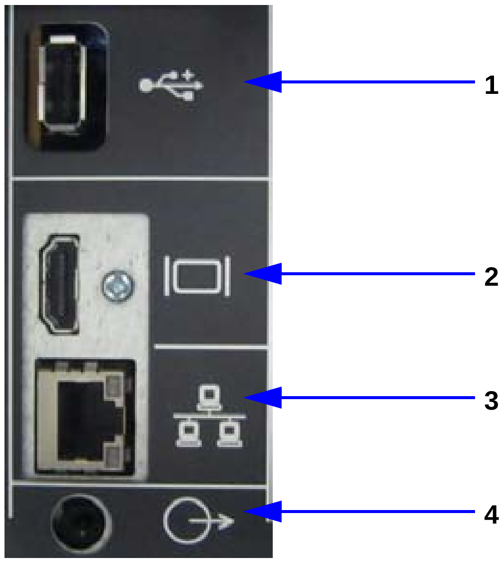


Figure 5-16 External I/O Connectors - on Rear of System (GES)

Item	Connector Name	Description
1	USB	USB-2.0 port
2	HDMI OUT	Connector for external Monitor TMDS signal with DDC_Control (HDMI or DVI) Resolution: SXGA(1280 X 1024)
3	NETWORK	DICOM input/output, twisted pair RJ-45 10/100 megabit/s
4	Audio	External Speaker

Figure 5-17 External I/O Connectors - on the TOP OPIO

Item	Connector Name	Description
1	USB	USB-2.0 port
2	USB	USB-2.0 port

NOTE: For further description of I/O connectors refer to *Section 3-8-4 "External I/O Connectors" on page 3-50.*

Section 5-9
Peripherals

5-9-1 Recording Tools

5-9-1-1 DVD Recorder

The DVR recorder is implemmented by installing the DVR Module on RFS incorporating with DVD Drive.

5-9-2 Printers

5-9-2-1 Black & White Digital Printer

The B&W Digital Printer receives image data via the USB port. The print command is controlled by the keys **P1**, **P2**, **P3** or **P4** on the Voluson® S8 / Voluson® S6 control panel (depending on system configuration).

5-9-2-2 Color Digital Printer

The Color Digital Printer receives image data via the USB port. The print command is controlled by the keys **P1**, **P2**, **P3** or **P4** on the Voluson® S8 / Voluson® S6 control panel (depending on system configuration).

5-9-2-3 Color Deskjet Printer

Normally, a Color Deskjet Printer is used to print out reports and exams, but in some cases also ultrasound images. It is controlled via Bluetooth Adapter.

5-9-3 DVD+R/RW Drive (Writer)

The DVD+R/RW Drive (Writer) is used to backup images and reports. In addition, it is used as the main source of software upgrades and other service utility operations. The DVD+R/RW drive can read/write CDs and DVDs. And also it is one of unit of DVR Recorder when DVR option is installed.

5-9-4 Wireless Network Adapter

The Voluson® S8 / Voluson® S6 supports a Wireless Network USB Adapter based on industry standards to provide easy-to-use and compatible high-speed wireless connectivity. For details regarding type and installation, refer to Section 3-5-5 "Connecting the Wireless Network Adapter" on page 3-19.

The Wireless Network USB Adapter provides a mobile network connection to the local area network.

5-9-5 Footswitch

The Footswitch is used for comfortable system control when no hand is free.
To adjust function of the Footswitch (Left/Right) see: Section 3-8-1-6 on page 3-47.

Section 5-10
Power Distribution

5-10-1 ACFE - Primary Power Module

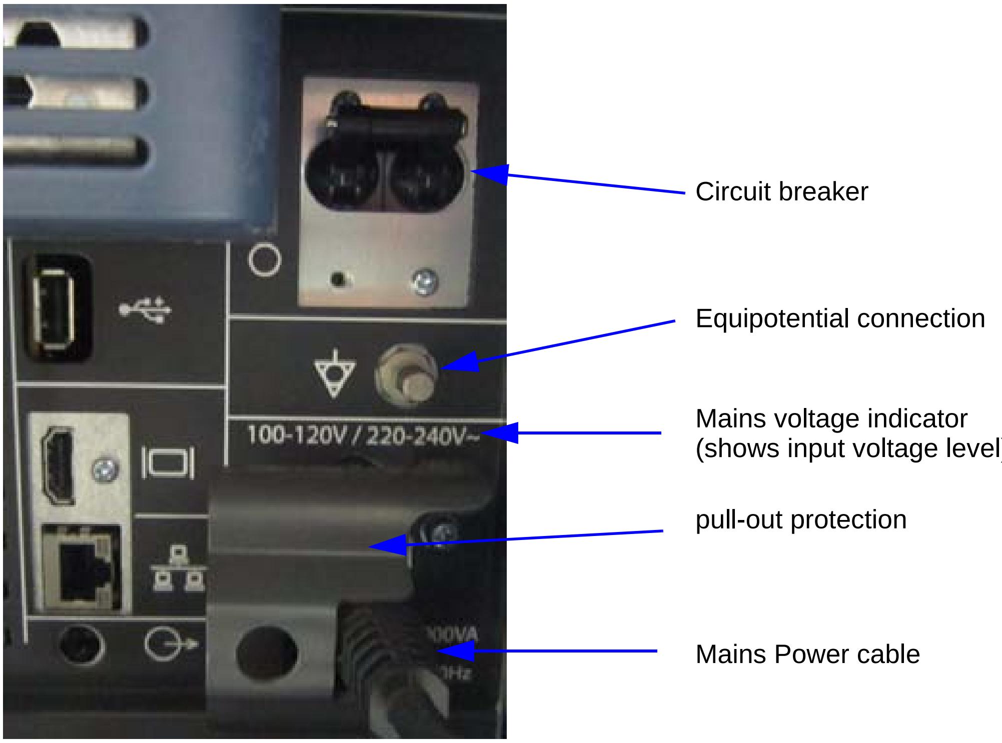


Figure 5-18 Primary Power Module

5-10-1-1 CPS Block Diagram

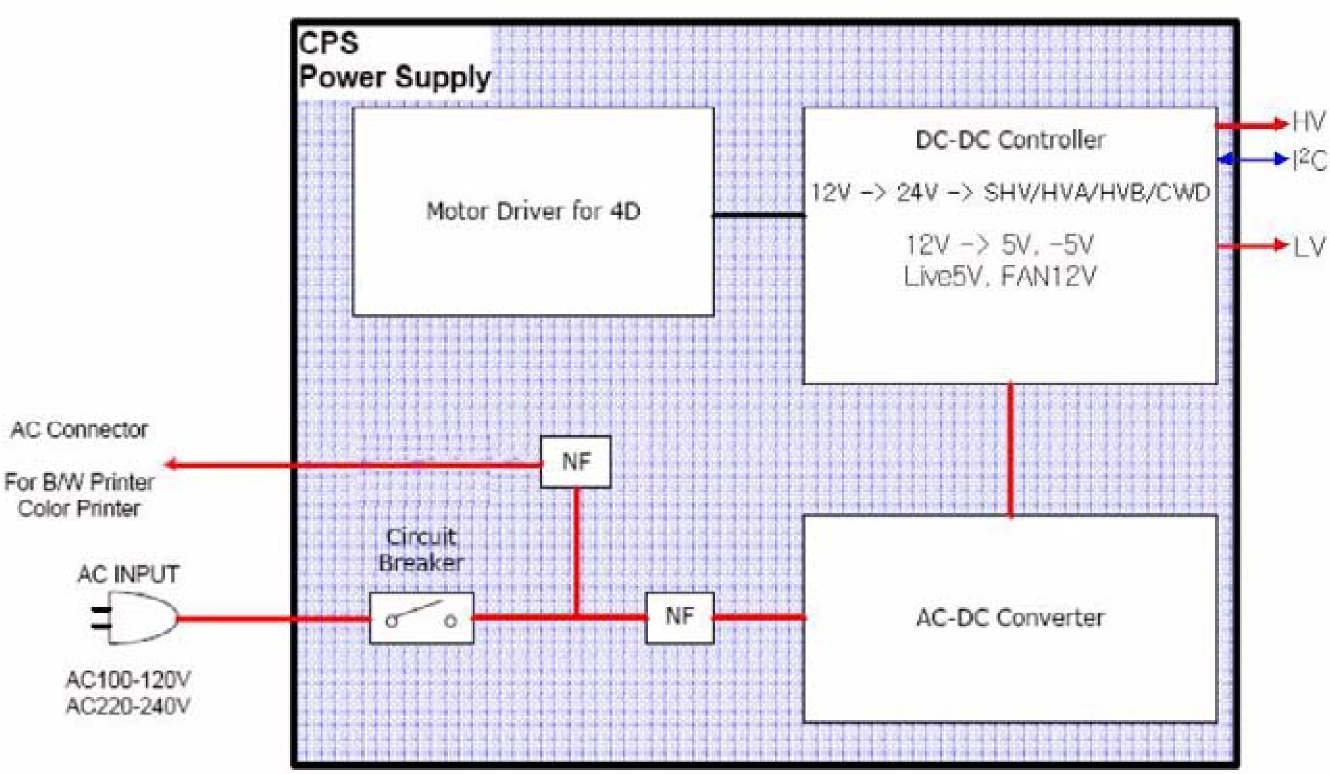


Figure 5-19 CPS Block Diagram

5-10-1-2 Power Distribution Block Diagram

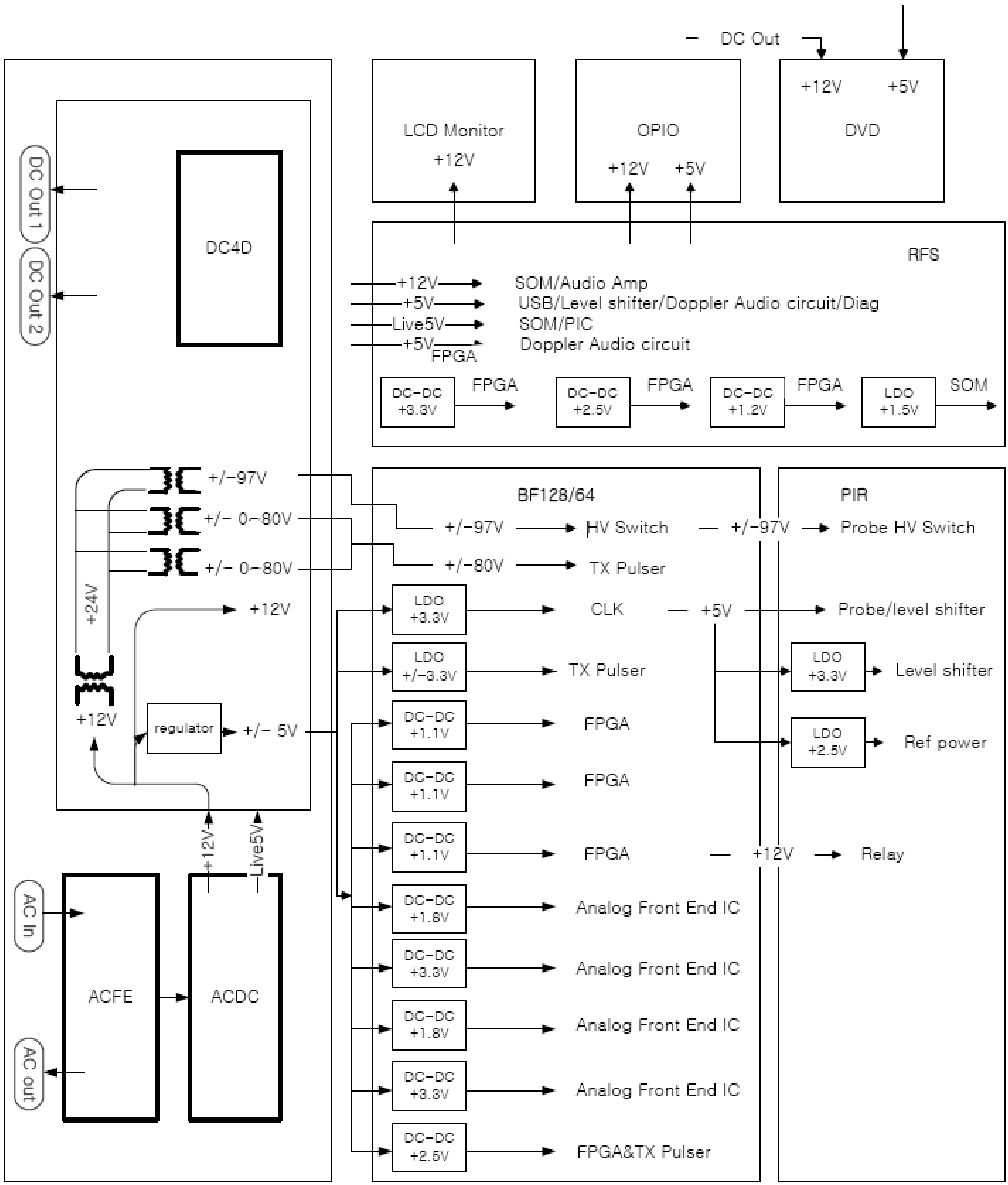


Figure 5-20 CPS Block Diagram

5-10-1-3 Power Up Sequence Description

The Power Up Sequence can be divided in the following steps:

- Switch Circuit Breaker in CPS to ON position
- Press the ON button on the Operator Panel
- RFS power-up

5-10-1-3-1 Power Up Sequence Description

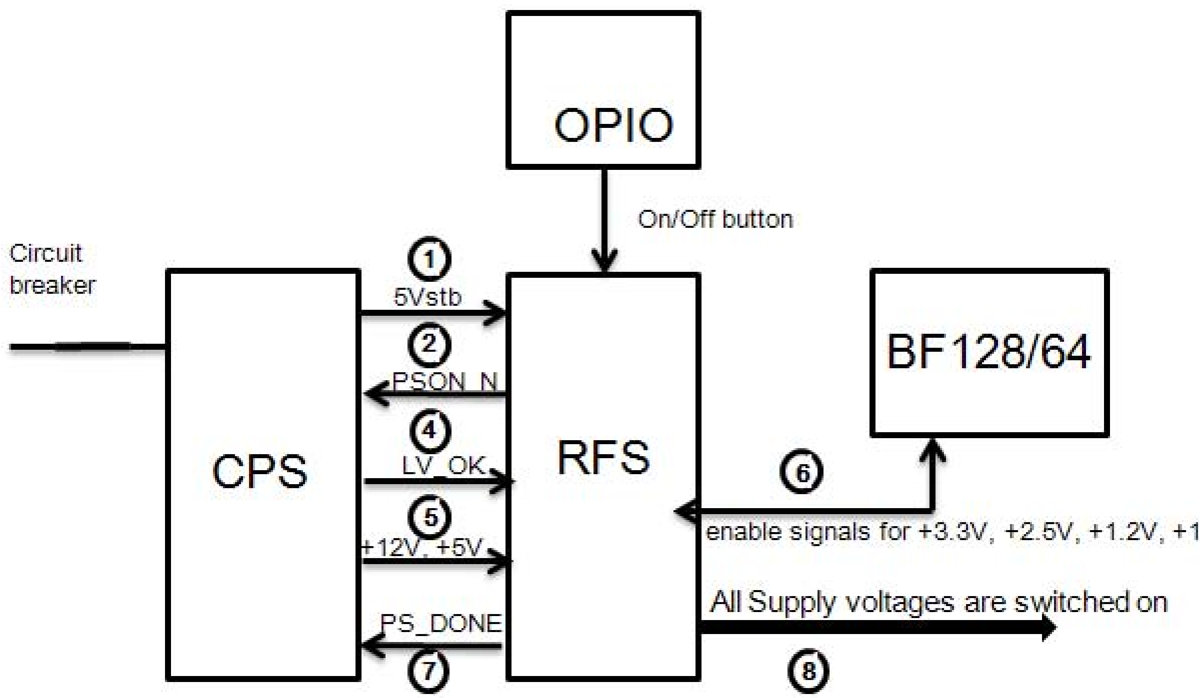


Figure 5-21 Power Up Sequence

1.) RFS, powered by 5Vstb, detects contact of Power-On button event.
2.) RFS sends PSON_N low to CPS
3.) CPS powers up +24V, +12V,±5V
4.) CPS provides LV_OK as soon as +12V is within specification
5.) CPS provides PC voltages from +12V, +5V.
6.) RFS distribute enable signals for +3.3V, +2.5V, +1.2V, +1.1 to itself and BF128/64.
7.) RFS provides PS_DONE output signal to CPS.
8.) All Supply voltages are switched on

5-10-1-3-2 Power Down Sequence Description

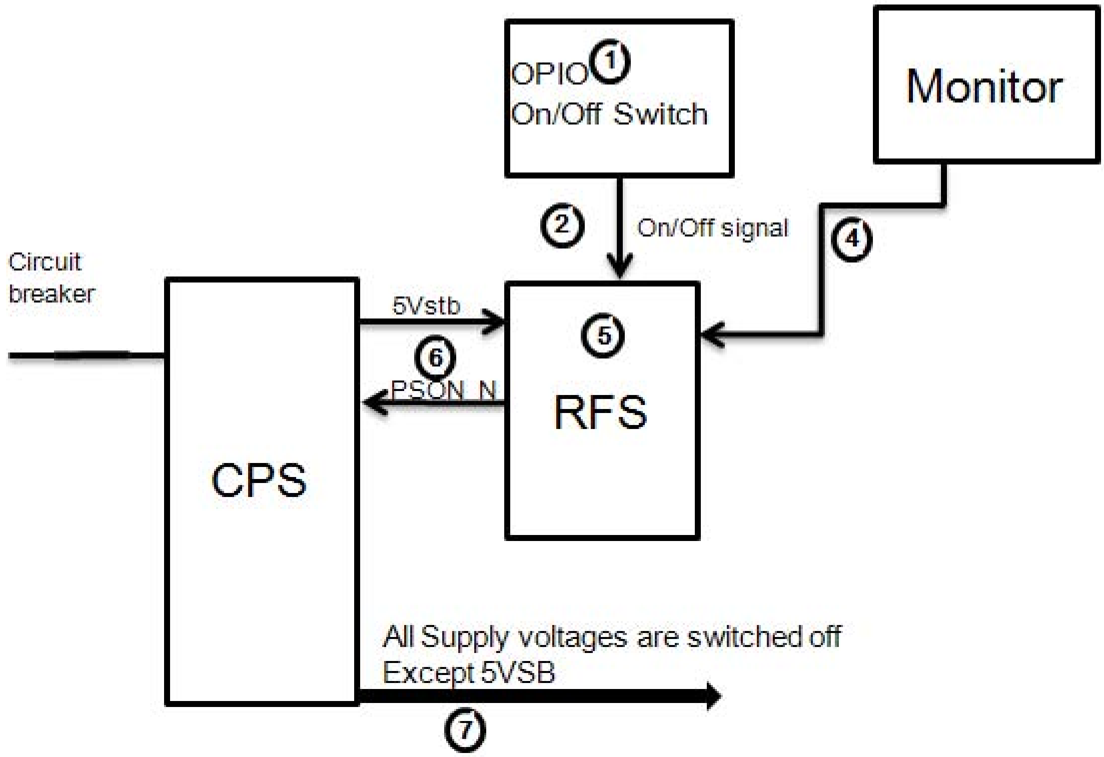


Figure 5-22 Power Down Sequence

1.) On/Off Switch is pressed on OPIO.
2.) ON/OFF signal is sent from On/Off Switch via OPIO cable to RFS
3.) “Shut down” dialog comes up and “Shut down” signal is sent.
4.) PC “Shut down” sequence is started in RFS.
5.) At the end of this sequence RFS sends PS_ON Signal to CPS.
6.) CPS shuts down all Supply voltages except Standby voltage (5VSB).

5-10-1-4 Mechanical Concept and Overview

The AC Power’s main tasks are to supply the internal subsystems with AC power. To reduce inrush current, an inrush current limiter is implemented.
Voltage to peripherals are provided from input without configuration.

From the Mains Power Input module, the AC power is routed via an Inrush Current Limiter to an internal ACDC module.

5-10-1-5 Functions of ACFE

- Inrush Current limiter
- Switch the peripheral power

NOTE: All DC-supply voltages for built in peripherals are generated in DCDC module not inside ACFE.

NOTICE The systems mains supply input voltage is a free voltage not need to configure for different AC power-in.

5-10-2 ACDC - primary DC Power Supply

5-10-2-1 Function of ACDC

With the AC input voltage from the ACFE, the ACDC module generates 12Vdc

5-10-3 DCDC - main DC Power Supply

With the 12Vdc from ACDC, the DCDC module generates all DC power sorces:

- Front end voltages
- Standby voltage
- Tx voltages
- DVD supply
- 4D module supply
- Fan supply

5-10-4 4D Module

In addition, the AC/DC device contains the digital motor amplifier.

Section 5-11
Mechanical Descriptions

5-11-1 Physical Dimensions

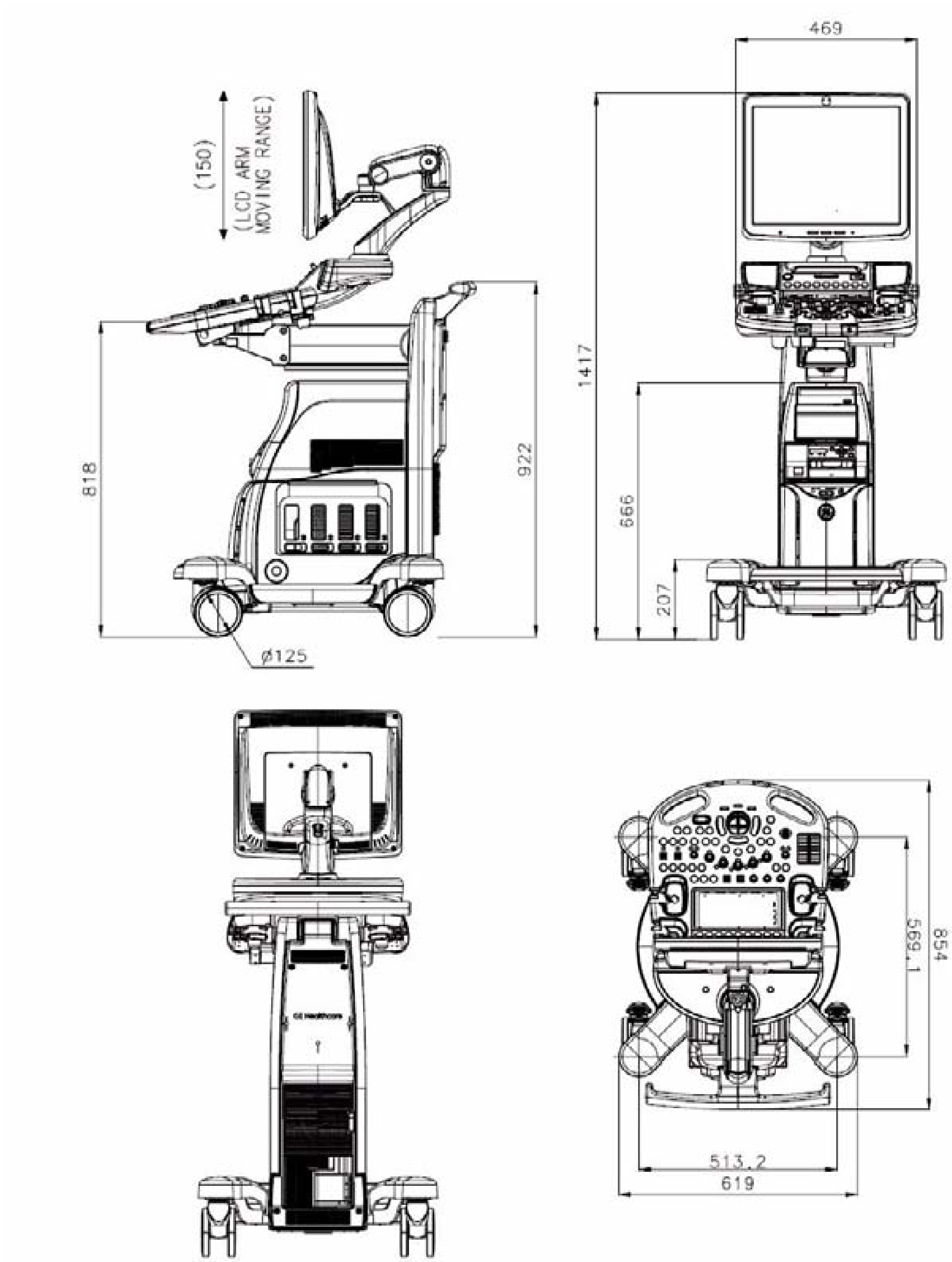


Figure 5-23 Physical Dimensions

5-11-2 LCD Monitor

The Voluson® S8 / Voluson® S6 has a free adjustable LCD monitor in relation to the user interface.

- position up/down: +/- 7.5 cm
- position left/right: +/- 18cm
- rotation up/down: +90°/-15°
- rotation left/right: +/- 90°

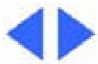
5-11-3 OPIO Positioning

The control console can be rotated, translated and adjusted in height.

- height adjustment: 27 cm (10.6 inch)
- rotation adjustment: +/- 30°

Figure 5-24 adjustable Control Console

5-11-3-1 Rotation of the Control Console



Press the ‘Rotate’ button in the outside of the front handlebar to rotate the OPIO to the desired position. Release the ‘Rotate’ button in order to secure the console against movement.

5-11-3-2 Height Adjustment of the OPIO Console

OPIO height adjustment is done with the button in the outside of the front handlebar.
As long as this key is pressed, OPIO can be elevated UP or DOWN by manually

5-11-4 Air Flow Distribution

Through the filter grid on the front of the system, air flow into the Voluson® S8 / Voluson® S6 scanner. By means of the 1 FAN, air is blown through the nest-box, and the warm air exits the scanner through holes in the left side panel and rear of the system.

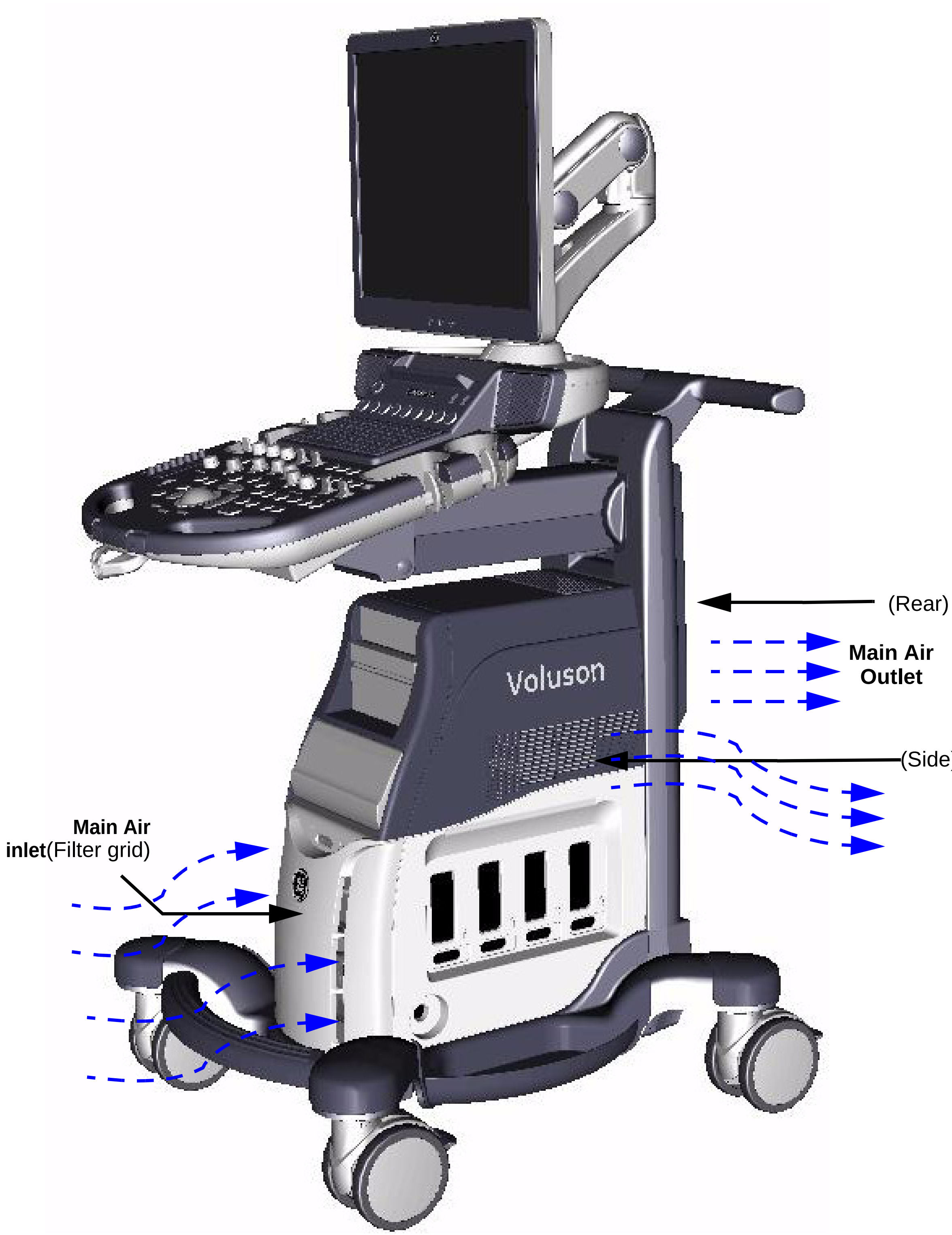


Figure 5-25 Air Inlet/Outlet at Voluson® S8 / Voluson® S6

Section 5-12
Service Platform

5-12-1 Introduction

The Service Platform will increase service productivity and reduce training and service costs.

5-12-2 Access / Security

The Service Platform has different access and security user levels.
Each user is only granted access to the tools that are authorized for their use.

- *Local Access*: via System Setup - Administration - **SERVICE** page
- *Local(Extended) Access*: A Service Dongle and the "Standard GE Revolving" password (password changes every six months) is necessary for use by GE Service when performing proprietary level diagnostics on the Voluson® S8 / Voluson® S6 ultrasound system.
- *Remote Access*: This offers GE technicians the possibility to view the entire customer´s desktop and operation system. Remote access to the Voluson® S8 / Voluson® S6 scanner requires permission and customer input to run diagnostics.

5-12-2-1 Local Access

1.) If not already in read mode, **FREEZE** the image.
2.) Press the **UTILITIES** key on the control panel and select SYSTEM SETUP to invoke setup desktop.
3.) On the left side of the screen select ADMINISTRATION and then click on the **SERVICE** tab.
4.) Enter the password SHE and then click the ACCEPT button.
5.) Click the CSD button.
6.) As soon as the GEHC Service Home Page appears, select "GE Service" from the pull-down menu, enter the "Standard GE Revolving" password (password changes every six months) and then click [Okay].

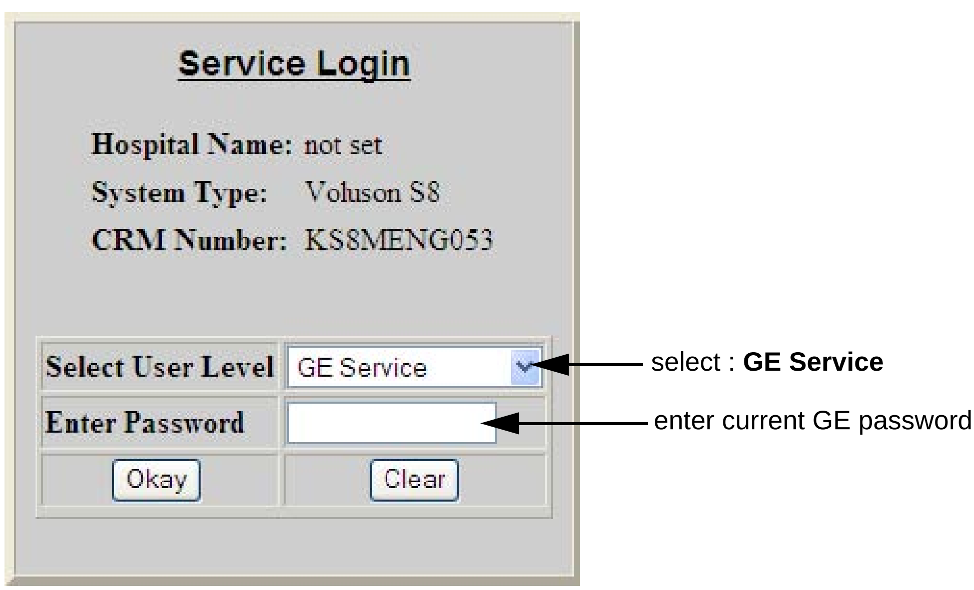


Figure 5-26 Service Login

The Common Service Desktop (CSD) is started and the **[Home]** page - containing basic System Information - appears. The navigation bar at the top of the screen allows to select different tools.

For more detailed information and description refer to Section 5-13 on page 5-51.

5-12-2-2 Local(Extended) Access

1.) If not already in read mode, **FREEZE** the image.
2.) Connect the USB “standard GE” service dongle to the front USB connector(s). As soon as the dongle is detected the “Extended Access” login window pops up..
3.) Enter the “Standard GE Revolving” password (changes every six months) and then click ENABLE .
4.) Select ”GE Service” from the pull-down menu (see: Section Figure 7-12 on page 7-13), enter the ”Standard GE Revolving” password (password changes every six months) and then click [Okay]..

5-12-2-3 Remote Access

NOTICE Remote access is **ONLY possible if the service platform is properly configured** (either by the user or a GE technician at site). Operation see: Section 7-5-4 "CSD: Configuration" on page 7-14.

This offers GE technicians the possibility to view the entire customer´s desktop and operation system. Remote access to the Voluson® S8 / Voluson® S6 scanner requires permission and customer input to run diagnostics.

“Disruptive Mode” can be selected by the customer directly on the Voluson® S8 / Voluson® S6 ultrasound system (as described below), or remotely by the service technician or OLC.

1.) If not already in read mode, **FREEZE** the image.
2.) Move the cursor to the GE icon and press the **right trackball key** (= right-click).
3.) Select ***Connect Clinical Lifeline*** (see: Figure 5-27 below).
This activates “Disruptive Mode” and “VCO” for the application OLC to quickly assist the customer.

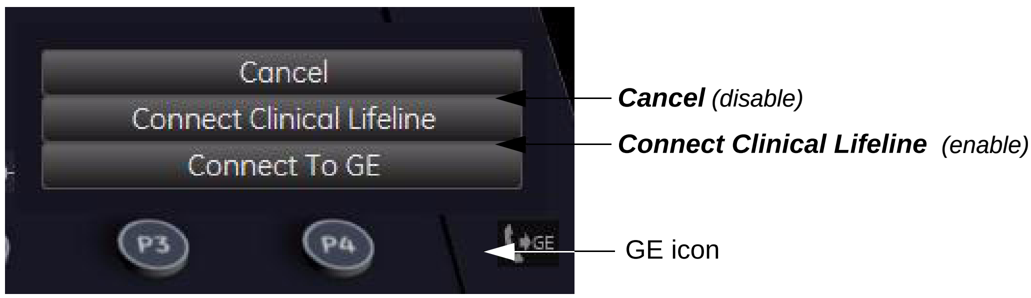


Figure 5-27 Connect Clinical Lifeline

NOTICE The ACTIVATE SERVICE button in in the Service Tools page (see: Figure 5-36 on page 5-55) also activates/deactivates “Disruptive Mode” and “VCO”.

NOTE: Visual information about the network status is shown in the status area on the bottom of the screen.

 Gray = **Idle State**	Remote access is inactive.
 Green = **Active State**	Disruptive Mode and Virtual Console Observation (VCO) is enabled, but there are no active incoming connections.
 Orange = **Disrupted State**	Remote Access is active. All processes [UL_VNC and UL_CSD] are active. In this state the Voluson® S8 / Voluson® S6 system should NOT be used clinically.

4.) If you select ***Cancel***, “Disruptive Mode” and “VCO” is turned OFF.

Section 5-13
Common Service Desktop (CSD)

5-13-1 Internationalization

The user interface provided by the service platform is designed for GE personnel and as such is in English only. There is no multi-lingual capability built into the Service Interface.

There are different possibilities to access the Common Service Desktop and its available features:

1.) *Local Access* via System Setup - Administration - SERVICE page
2.) *Local(Extended) Access* by means of service dongle and GE password
3.) *Remote Access* requires customers permission

As soon as the Common Service Desktop (CSD) is started, the Service **[Home]** Page appears.

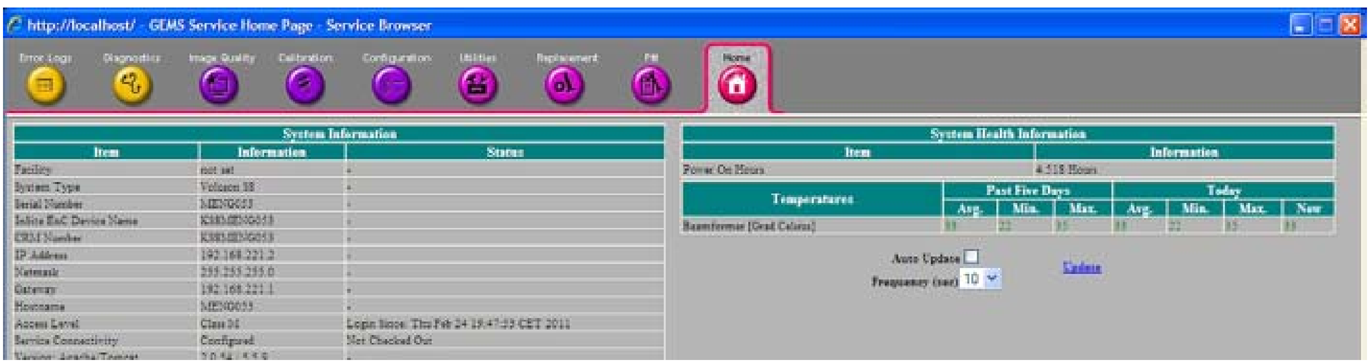


Figure 5-28 Common Service Desktop - Home

The navigation bar at the top of the screen allows to select from following tools:

- Error Logs on page 5-52
- Diagnostics on page 5-52
- Image Quality on page 5-53
- Configuration on page 5-53
- Utilities on page 5-54
- Replacement on page 5-54
- PM on page 5-54

5-13-2 Error Logs

When the **Error Logs** page is selected, different log viewing options are available.
Log Viewer is displayed in a separate window.

5-13-3 Diagnostics

Figure 5-29 Common Service Desktop - Error Logs

The **Diagnostic** page uses a web-controlled user interface to provide access to common service components and perform diagnostics.

- **Non-Interactive:** The tests are performed without the user's intervention.
- **Interactive:** The user is required to perform an operation on the ultrasound unit in order for the test to be completed successfully. This option is not applicable when used remotely.

Figure 5-30 Common Service Desktop - Diagnostics

5-13-4 Image Quality

In the **Image Quality** page, you can verify image quality.

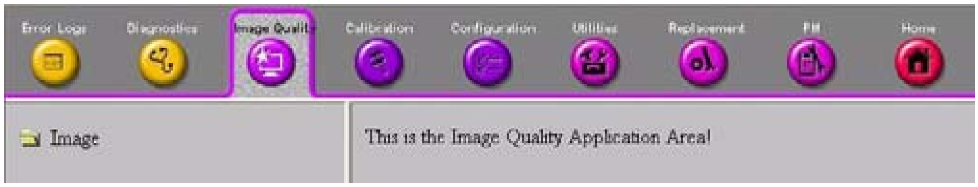


Figure 5-31 Common Service Desktop - Image Quality

NOTE: This **page is not populated** in this version.

5-13-5 Configuration

In the **Configuration** page, you can view and modify different device informations and configurations. in the “InsiteExC Agent Configuration” option field.

Figure 5-32 Common Service Desktop - Configuration

NOTICE Remote access is **ONLY possible if the service platform is properly configured** (either by the user or a GE technician at site). Operation see: Section 7-5-4 "CSD: Configuration" on page 7-14.

5-13-6 Utilities

The **Utilities** page contains a variety of Windows utility tools to indicate the status of the system, in addition to various other tools.

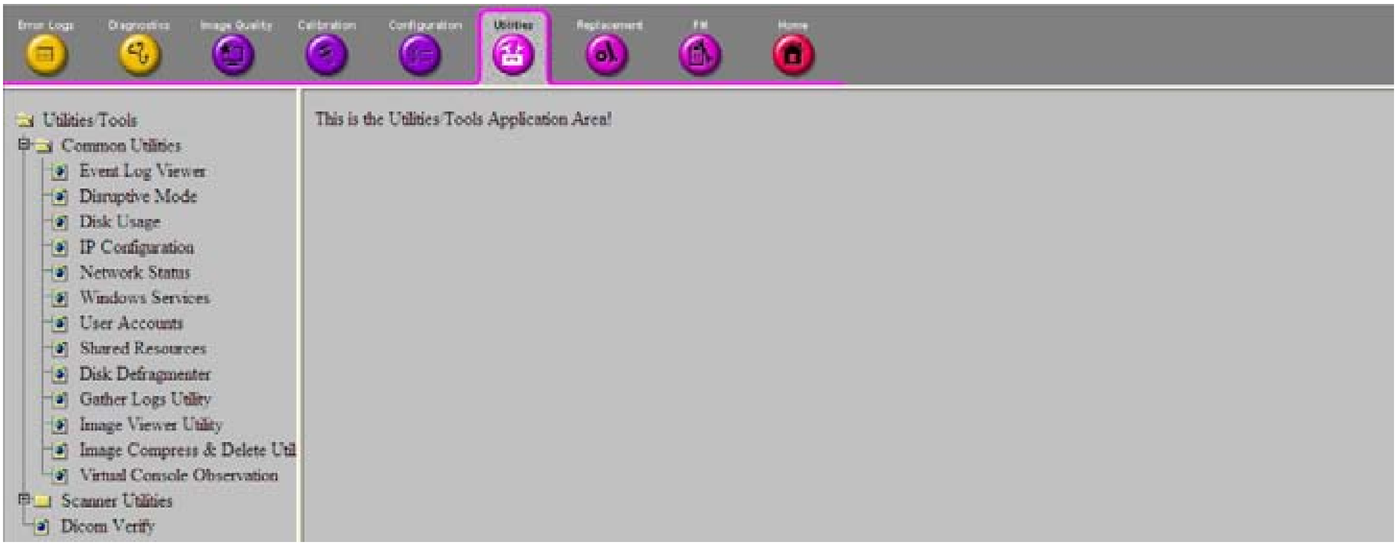


Figure 5-33 Common Service Desktop - Utilities

5-13-7 Replacement

In the **Replacement** page, Hardware parts and their versions are displayed.

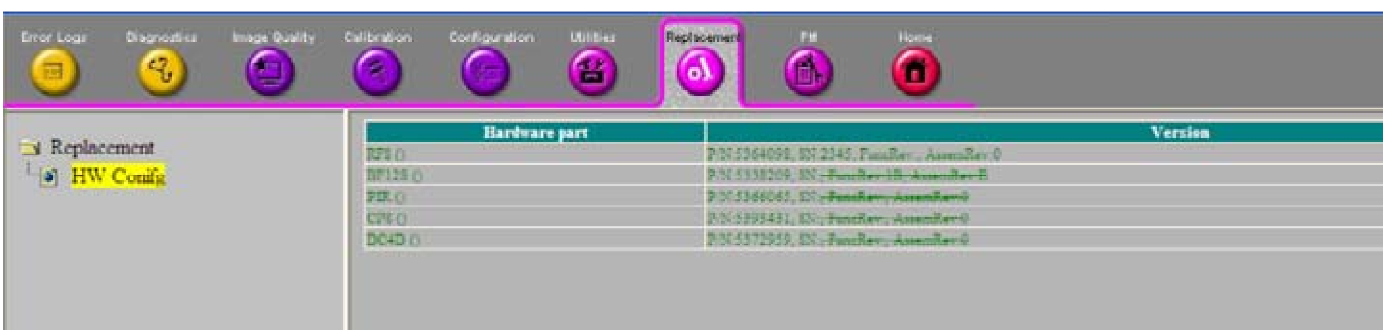


Figure 5-34 Common Service Desktop - Replacement

5-13-8 PM

In the **PM** page, information about planned, proactive and preventive maintenance is displayed, as described in Chapter 10 - Care & Maintenance, on page 10-1.

Figure 5-35 Common Service Desktop - PM

NOTE: This **page is not populated** in this version.

Section 5-14
Service Page

5-14-1 Introduction

The Service Page contains specific software/hardware test modules, system setup, update, etc. for Voluson systems only.

5-14-2 Access / Security

The service page has different access and security user levels.
Each user is only granted access to the tools that are authorized for their use.

5-14-3 Service Login

1.) Press the **UTILITIES** key on the control panel.
2.) In the "Utilities" menu select SYSTEM SETUP to invoke the setup desktop on the screen.
3.) If not already done, connect the USB "standard GE" service dongle to the front USB connector(s). As soon as the dongle is detected the login window pops up.
4.) Enter the "Standard GE Revolving" password (changes every six months) and then click ENABLE.
5.) On the left side of the screen select ADMINISTRATION and then click the **SERVICE** tab.
6.) Click the SERVICE TOOLS button on the Service window to get access to the "Service Tools" page.

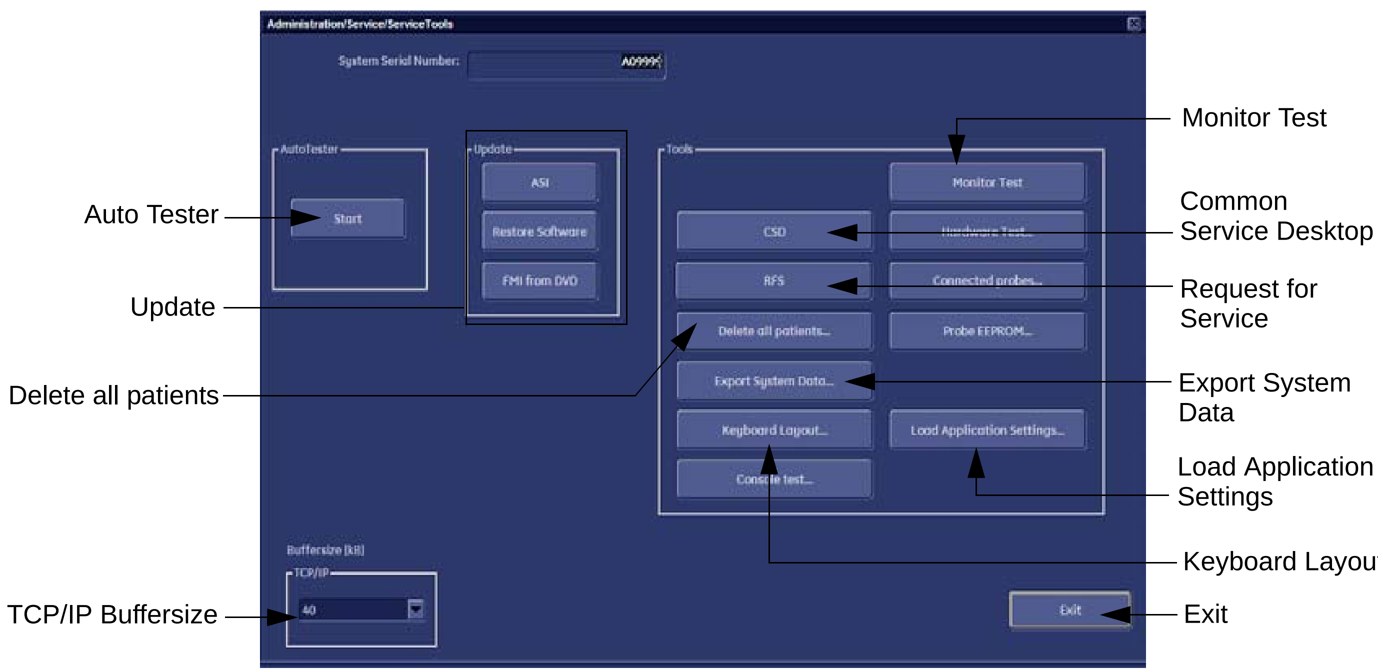


Figure 5-36 Service Tools window

5-14-3-1 Auto Tester

Autotester is a log function of customer activities. It records all user actions (scanning, entries, performing Calculations, review of Patient Reports, etc.…). It is possible to safe (record) as file on HDD. But also export to DVD/CD can be done to allow replay of the records on other units.

NOTICE For intermittent problems this file can be requested from the Service Engineer or customer. It is possible to burn this file on DVD/CD+R/RW.

Operation see: Section 7-6 "How to use the Auto Tester program" on page 7-15.

5-14-3-2 Update

5-14-3-2-1 FMI from DVD

By means of the FMI FROM DVD button, the Systems C:\ image is partly or completely updated. The System Software parts to be upgraded depend on contents of the used System DVD.

PRECONDITION: The first “Boot Device” in BIOS has to be **Hard Disk Drive**.

*NOTE: During “FMI from DVD” the used system configuration (incl. Full Backup) will be stored on R:\. If required, the previously used System configuration (before FMI from DVD was performed) can be restored by activating the “**Rollback**” function. Operation see: Section 5-15-1-3 on page 5-59.*

5-14-3-2-2 ASI - Additional Software Installation

Click the ASI button to install additional software (e.g., Process Logger).
The Software parts to be installed depend on the contents of the System DVD that is used.

5-14-3-2-3 Restore Software

Click the RESTORE SOFTWARE button to restore the system software from your hard disk.

5-14-3-3 TCP/IP Buffersize

The TCP/IP Buffersize selects the amount of buffer memory used for DICOM transfers (both directions).

5-14-3-4 Common Service Desktop (CSD)

Access to the Common Service Desktop (CSD) by entering security user level and password.
Activate the service platform as described in Section 5-12-2 on page 5-48.

5-14-3-5 Request for Service

Click the RFS button, fill out the “Request For Service” form and then send the problem description to GE Service/Application representatives.
Operation see: Section 7-2-1 "Request for Service (RFS)" on page 7-4

5-14-3-6 Delete all Patients

1.) Click the DELETE ALL PATIENTS... button. Following WARNING message appears on the screen.

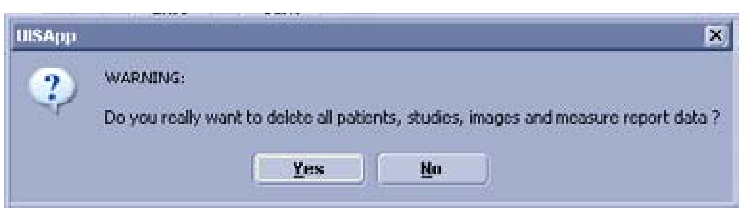


Figure 5-37 Warning message

WARNING ***If you select the YES button, all patients data, studies, images and measure report data will be deleted permanently from the hard disk and cannot be recovered!***

5-14-3-7 Export System Data

Select the EXPORT SYSTEM DATA button on the “Service Tools” page to Full Backup the System State. This includes dump-files and text files, the full Service Database informations about probes, boards, Software, Options and the Event Log File to the DVD Drive.
Operation see: Section 7-4-2 "Export Log’s and System Data" on page 7-8.

5-14-3-8 Keyboard Layout

To change the keyboard layout to different languages.
Operation see: Section 6-4 "Modification of Keyboard Layout" on page 6-11.

5-14-3-9 Monitor Test

Select the MONITOR TEST button to perform color calibration.
Operation see: Section 6-3 "LCD Monitor Adjustment" on page 6-2.

5-14-3-10 Load Application Settings

If the Tune version of the Application presets does not match the Application Software version, it is probably that there are adverse affects on image quality (e.g., after reloading an old “Full Backup”).

Select the LOAD APPLICATION SETTINGS button on the “Service Tools” page to load proper Application Settings (image presets), adapted for the used system software version.

NOTICE When reloading these Application Settings, any existing User Programs, 3D/4D Programs and Auto Text **remain unaffected**!

1.) Select the LOAD APPLICATION SETTINGS button on the “Service Tools” page (Figure 5-36 on page 5-55).
2.) Choose the media and then click LOAD.

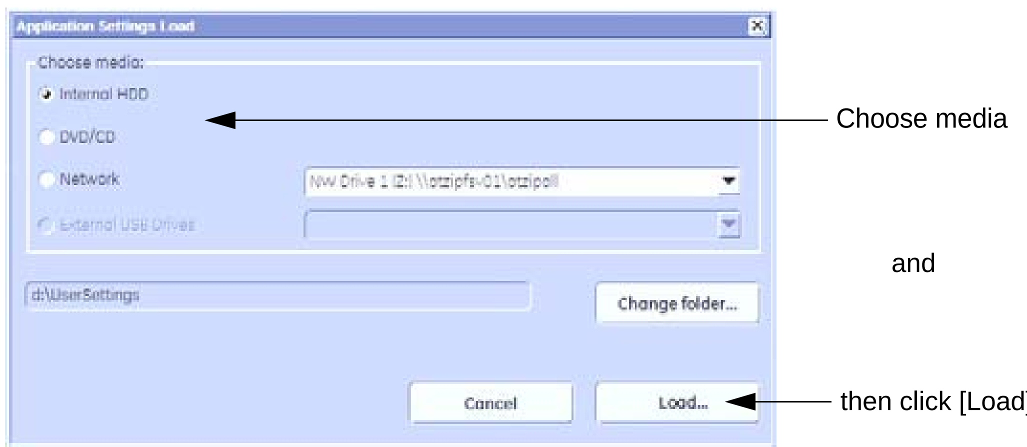


Figure 5-38 Application Settings Load

3.) Select the desired file and then click OK.

Load procedure starts immediately including a reboot of the system.

NOTICE If the ID of the Application Setting is not valid for the currently installed Application Software version, a warning message *“Application Settings from selected backup are not compatible with current system. Application Settings have not be loaded.”* appears during boot up sequence.

4.) If warning message is displayed, confirm it with OK and then load appropriate Application Settings (perform loading procedure as described in steps above).

Section 5-15
Boot Screen Functions

5-15-1 Overview

Following LINUX supported functions are available as soon as the “Boot Screen” appears:

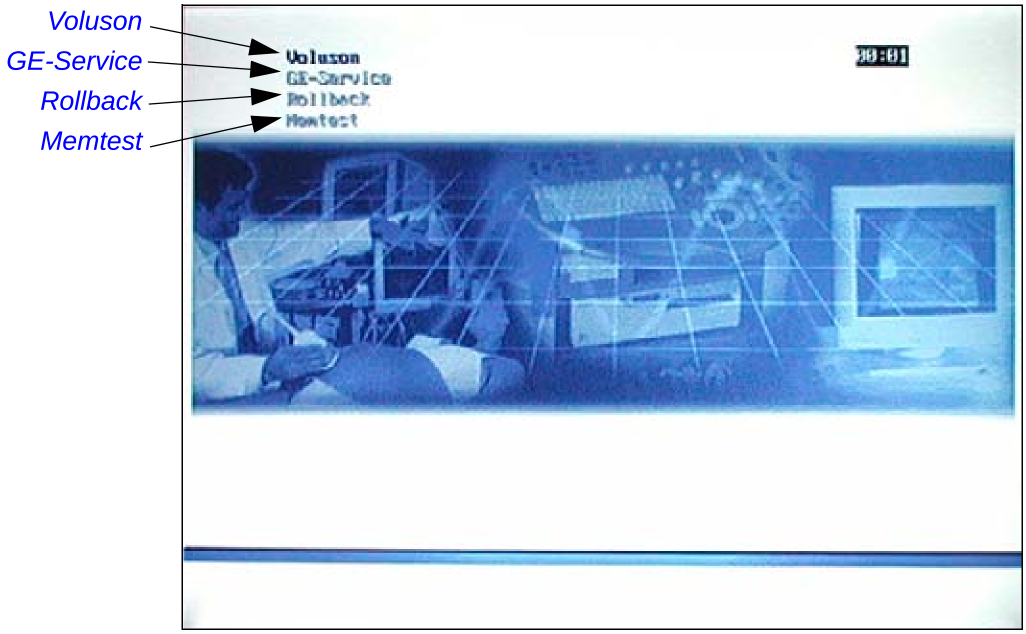


Figure 5-39 Boot screen

NOTICE After 3 sec. without pressing any key, the system will boot-up in windows (= **Voluson** item).

5-15-1-1 Voluson

The System will boot-up in windows. The Ultrasound Application is started.
For details refer to Section 3-6-2-3 "During a normal boot, you may observe" on page 3-27.

5-15-1-2 GE-Service

The *Voluson Maintenance System* functions are secured by service password (class C).

1.) Turn system OFF and then back ON.
2.) As soon as the “Boot Screen” appears (see: Figure 5-39 above), press the **PG DN** [Arrow down] key on the keyboard until the **GE Service** item is highlighted, then press **ENTER**.
3.) Enter the Password Rudi (case sensitive) and confirm with **ENTER**. The system boots into LINUX.

CAUTION *After 3 sec. without pressing any key, the system will boot-up in windows (= **Voluson** item).*
If you missed step 2, retry again with **CTRL** + **ALT** + **DEL**.

5-15-1-3 Rollback

This function offers the possibility to simply restore the previously used system configuration (rollback), which was stored on R:\ during “FMI from DVD”.

1.) Turn system OFF and then back ON.
2.) As soon as the “Boot Screen” appears (see: Figure 5-39 on page 5-58), press the **PG DN** [↓ Arrow down] key on the keyboard until the **Rollback** item is highlighted, then press **ENTER**.
3.) When the following WARNING message appears, press the ← [Arrow left] button to highlight OK and then press **ENTER**.

select [OK]

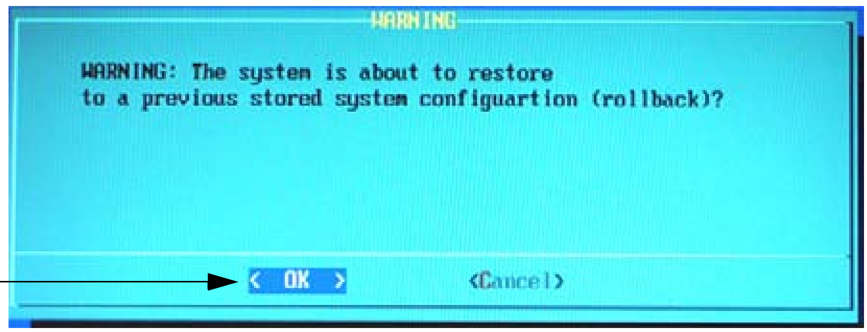


Figure 5-40 Warning message

After performing the rollback, the system reboots.
The Ultrasound Application is started and finally the 2D screen is displayed on the monitor.

5-15-1-4 Memtest

Starts the PC Memory Test.
Operation see: Section 5-15-2 "Memory Check in LINUX" on page 5-60.

5-15-2 Memory Check in LINUX

1.) Turn system OFF and then back ON.

2.) As soon as the “Boot Screen” appears (see: Figure 5-39 on page 5-58), press the **PG DN** [↓ Arrow down] key on the keyboard until the **Memtest** item is highlighted, then press **ENTER**.

NOTICE After 3 sec. without pressing any key, the system will boot-up in windows.
If you missed step 1, retry again with **CTRL** + **ALT** + **DEL**.

The PC Memory Test will start automatically and will take about 0.5 hours.
If there are errors they will be listed.

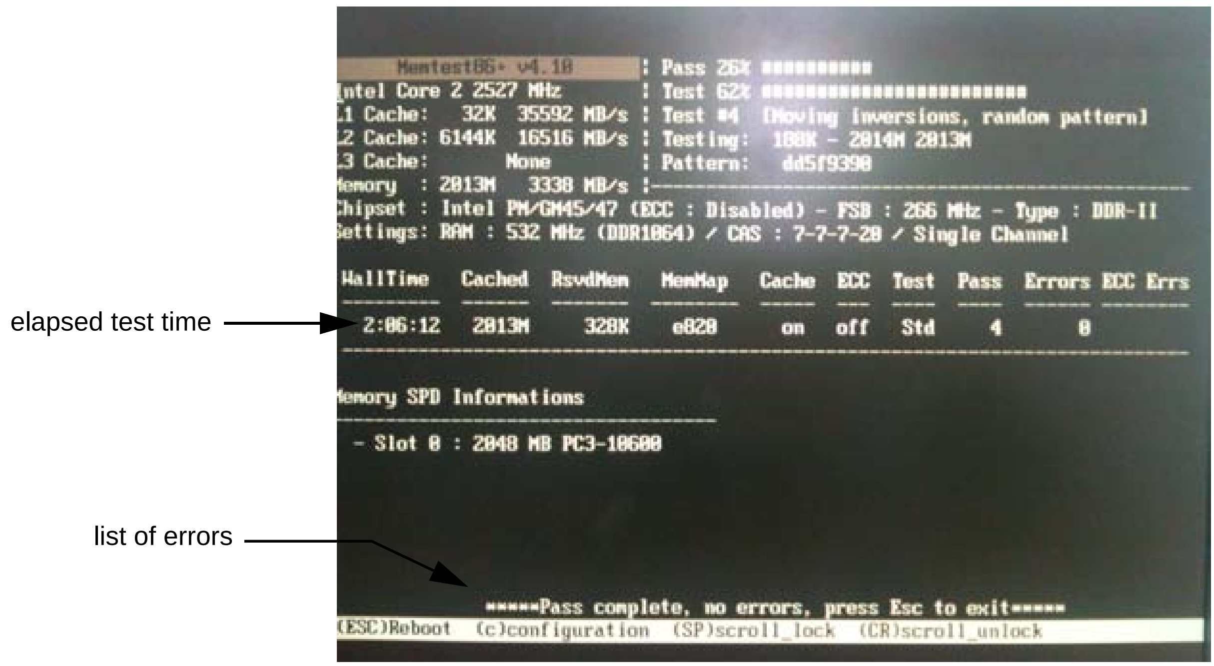


Figure 5-41 Memory check in LINUX

NOTICE After one cycle (~ 0.5 hours) the memory check starts again. To interrupt the test, press the **ESC** key.
If you don’t interrupt the memory test by pressing the **ESC** key, it will perform never ending cycles of memory checks.

NOTE: If after one cycle (about 0.5 hours), no error messages are listed, it can be assumed that the Back End Processor including power supply is working properly.

Chapter 6
Service Adjustments

Section 6-1
Overview

6-1-1 Purpose of Chapter 6

This chapter describes how to test and adjust the mechanical capabilities of a scanner that may be out of specification. Although some tests may be optional they should only be performed by qualified personnel.

Table 6-1 Chapter 6 Contents

Section 6-2
Regulatory

Verify, where applicable, that any regulatory information or tests required by national law are present and accounted for, and any regulatory tests required by national law are performed *and* documented.

Section 6-3
LCD Monitor Adjustment

The Voluson® S8 / Voluson® S6 has a free adjustable LCD monitor in relation to the user interface.]

- Screen resolution ... 1280x1024

- Screen refresh rate ... 60Hz

The digital control panel is located at the front of the color monitor. **It is NOT recommended to change the pre-adjusted settings.** However, if you are not satisfied with the factory settings, use these controls to program those you prefer in each resolution.

*NOTE: All changed values will only be saved by selecting “Exit” from the OSD.
If not, the adjusted values will be lost after loss of power.*

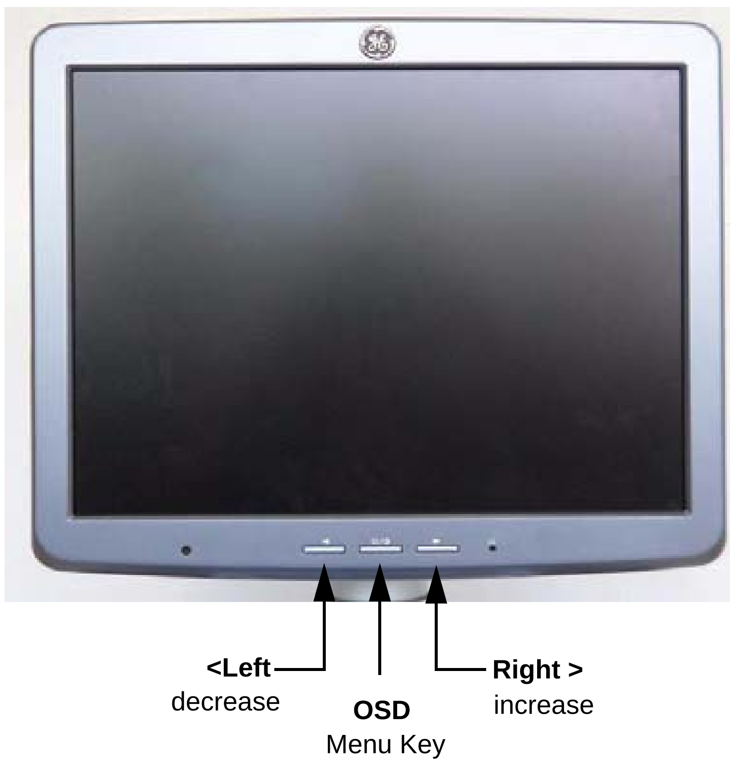


Figure 6-1 Monitor Adjustment buttons

Table 6-2 On Screen Display (OSD) Menu

Controls	Range	Default Value
Contrast	0~100%	100%
Brighness	0~100%	80%
Colortemp/Gamma Select	2.2 or 2.4	2.4
Colortemp/Mode	9000K/11000K/13000K/15000K/USER	13000K
Scale	Full/5:4/Native	Full
SBC	ON/OFF	ON
Language	English/German/French/Spanish/ Italian/Swedish/Chinese/Japanese	English
H-Position	0~100%	50%
V-Position	0~100%	50%
Half Tone	0~100%	63%

6-3-1 Brightness/Contrast

6-3-1-1 Brightness

Adjusting the monitor’s contrast and brightness is one of the most important factors for proper image quality. If these controls are set incorrectly, the Gain, TGC, Dynamic Range and even Acoustic Output may have to be changed more often than necessary to compensate.

The proper setup displays a complete gray scale. The lowest level of black should just disappear into the background and the hightest white should be bright, but not saturated.

1.) Adjust the BRIGHTNESS by pressing the < **LEFT** or **RIGHT**> button to decrease/increase value. (Default:80)

Figure 6-2 Brightness Adjust

6-3-1-2 Contrast

1.) Press the MENU (middle) key of the monitor controls over 10 sec.

2.) Select the Picture -> Contrast by pressing the < LEFT or RIGHT > button to decrease/ increase cursor and the MENU (middle) key.

3.) Adjust the CONTRAST by pressing the < LEFT or RIGHT > button to decrease/increase the value. (Default : 80)

Figure 6-3 Contrast Adjust

NOTE: Brightness and Contrast should be adjusted at examination room light conditions. Typically values for Contrast =100 , Brightness = 80 (depending on the operator).

6-3-1-2-1 Gamma

1.) Press the **MENU** (middle) key of the monitor controls over 10 sec.
2.) Select the Picture -> Color Temp -> GAMMA by pressing the < **LEFT** or **RIGHT** > button to move the cursor and the **MENU** (middle) key.
3.) Select 2.2 or 2.4 by pressing the < **LEFT** or **RIGHT** > button to decrease/increase the value and the **MENU** (middle) key. (Default : 2.4)

6-3-1-2-2 Mode

1.) Press the **MENU** (middle) key of the monitor controls over 10 sec.
2.) Select the Picture -> Color Temp -> MODE by pressing the < **LEFT** or **RIGHT** > button to decrease/ increase cursor and the **MENU** (middle) key.
3.) Select 2.2 or 2.4 by pressing the < **LEFT** or **RIGHT** > button to decrease/increase the value and the **MENU** (middle) key.(Default : 13000K)
4.) If selecting USER mode, adjust the R/G/B value by pressing the < **LEFT** or **RIGHT** > button to decrease/increase the value.

6-3-2 Function

Figure 6-4 Function

6-3-2-1 Scale

The size of image is displayed in monitor versus actual image data from system.

1.) Press the **MENU** (middle) key of the monitor controls over 10 sec.
2.) Select the FUNCTION -> Scale by pressing the < **LEFT** or **RIGHT** > button to move the cursor and the **MENU** (middle) key.
3.) Select FULL/5:4/NATIVE by pressing the < **LEFT** or **RIGHT** > button to decrease/increase the value and the **MENU** (middle) key.(Default : FULL)

6-3-2-2 Information

1.) Press the **MENU** (middle) key of the monitor controls over 10 sec.
2.) Select the FUNCTION -> INFORMATION by pressing the < **LEFT** or **RIGHT** > button to move the cursor and the **MENU** (middle) key.

Figure 6-5 Information

6-3-2-3 Memory Recall

1.) Press the **MENU** (middle) key of the monitor controls over 10 sec.
2.) Select the FUNCTION -> MEMORY RECALL by pressing the < **LEFT** or **RIGHT** > button to move the cursor and the **MENU** (middle) key.

NOTE: MEMORY RECALL is Factory default. If selecting MEMORY RECALL, all settings will be back to factory default status.

6-3-2-4 SBC

The module to sense the brightness to keep the brightness value.

1.) Press the **MENU** (middle) key of the monitor controls over 10 sec.
2.) Select the FUNCTION -> SBC by pressing the < **LEFT** or **RIGHT** > button to move the cursor and the **MENU** (middle) key.
3.) Select ON/OFF by pressing the < **LEFT** or **RIGHT** > button to decrease/increase the value and the **MENU** (middle) key.(Default : ON)

6-3-3 OSD

Figure 6-6 OSD

6-3-3-1 Language

1.) Press the **MENU** (middle) key of the monitor controls over 10 sec.
2.) Select the OSD -> LANGUAGE by pressing the < **LEFT** or **RIGHT** > button to move the cursor and the **MENU** (middle) key.
3.) Select English/German/French/Spanish/ Italian/Swedish/Chinese/Japanese by pressing the < **LEFT** or **RIGHT** > button to decrease/increase the value and the **MENU** (middle) key.(Default : English)

6-3-3-2 H-Position

1.) Press the **MENU** (middle) key of the monitor controls over 10 sec.
2.) Select the OSD -> H-POSITION by pressing the < **LEFT** or **RIGHT** > button to decrease/increase cursor and the **MENU** (middle) key.
3.) Adjust the H-POSITION by pressing the < **LEFT** or **RIGHT** > button to decrease/increase the value.(default : 50)

6-3-3-3 V-Postion

1.) Press the **MENU** (middle) key of the monitor controls over 10 sec.
2.) Select the OSD -> V-POSITION by pressing the < **LEFT** or **RIGHT** > button to decrease/increase cursor and the **MENU** (middle) key.
3.) Adjust the V-POSITION by pressing the < **LEFT** or **RIGHT** > button to decrease/increase the value.(default : 50)

6-3-3-4 Half Tone

1.) Press the **MENU** (middle) key of the monitor controls over 10 sec.
2.) Select the OSD -> HALF TONE by pressing the < **LEFT** or **RIGHT** > button to decrease/increase cursor and the **MENU** (middle) key.

3.) Adjust the HALF TONE by pressing the < **LEFT** or **RIGHT** > button to decrease/increase the value.(default : 50)

6-3-4 Exit

When finishing the Adjusting Menu, select the **EXIT** (middle) and press the **MENU** (middle) key.

6-3-5 Monitor setup

NOTE: Changing the monitor settings through the utility page, it takes 1 second to apply the adjusted value to the monitor.

1.) Press the **UTILITIES** key on the control panel.

On the left side of the screen select the **MONITOR**.

Figure 6-7 Monitor settings

2.) Select **OSC CONTROLS.** Adjust Brightness/Contrast/Backlight/Sharpness and Press **OK.**

Figure 6-8 OSD Adjust - General

3.) Select **RGB** tab**.** Adjust Color Temperature Presets and Press **OK.**

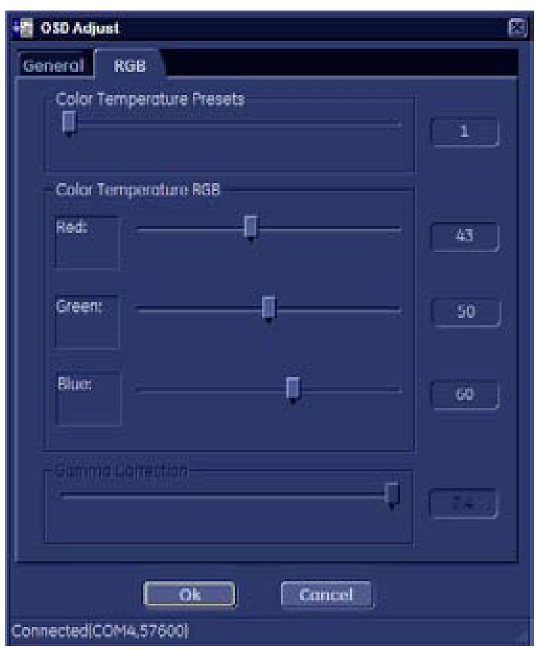


Figure 6-9 OSD Adjust - RGB

Section 6-4
Modification of Keyboard Layout

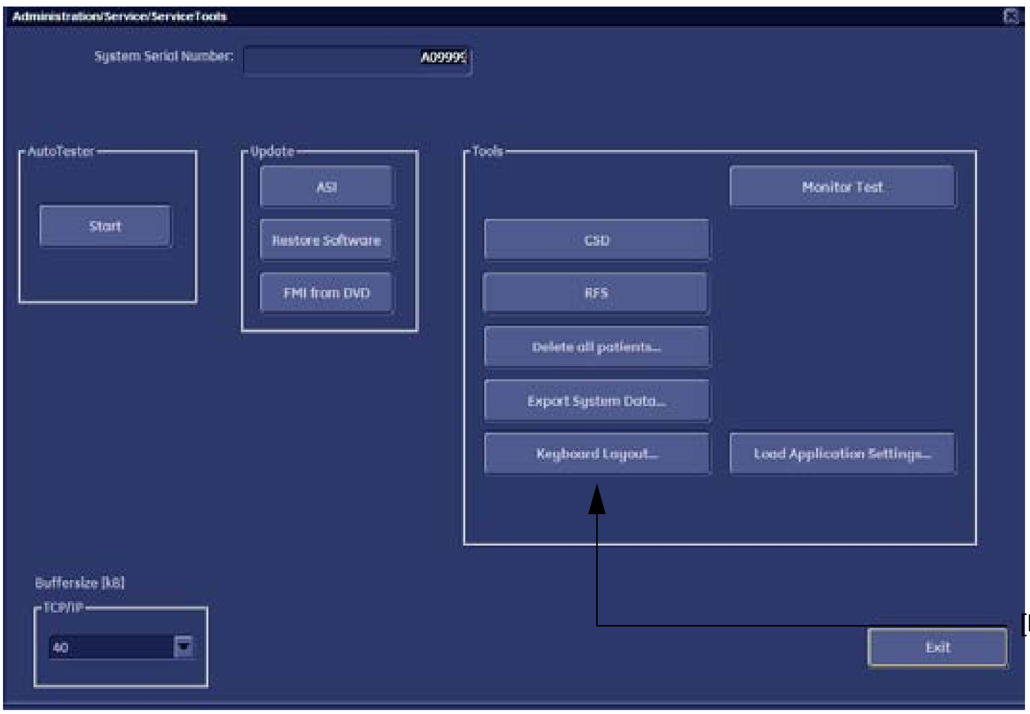
6-4-1 Setup the Voluson® S8 / Voluson® S6 Keyboard Language Layout

1.) Press the **UTILITIES** key on the control panel.

2.) In the "Utilities" menu select SYSTEM SETUP to invoke the setup desktop on the screen.

3.) On the left side of the screen select ADMINISTRATION and then click the **SERVICE**. The "password window" appears automaticaly.

4.) Enter the password SHE and click the **ACCEPT** button to display the Service Tools window.



[Keyboard Layout] button

Figure 6-10 Service Tool window

5.) Click the **KEYBOARD LAYOUT** button.

6.) Select default input language from the drop down menu.

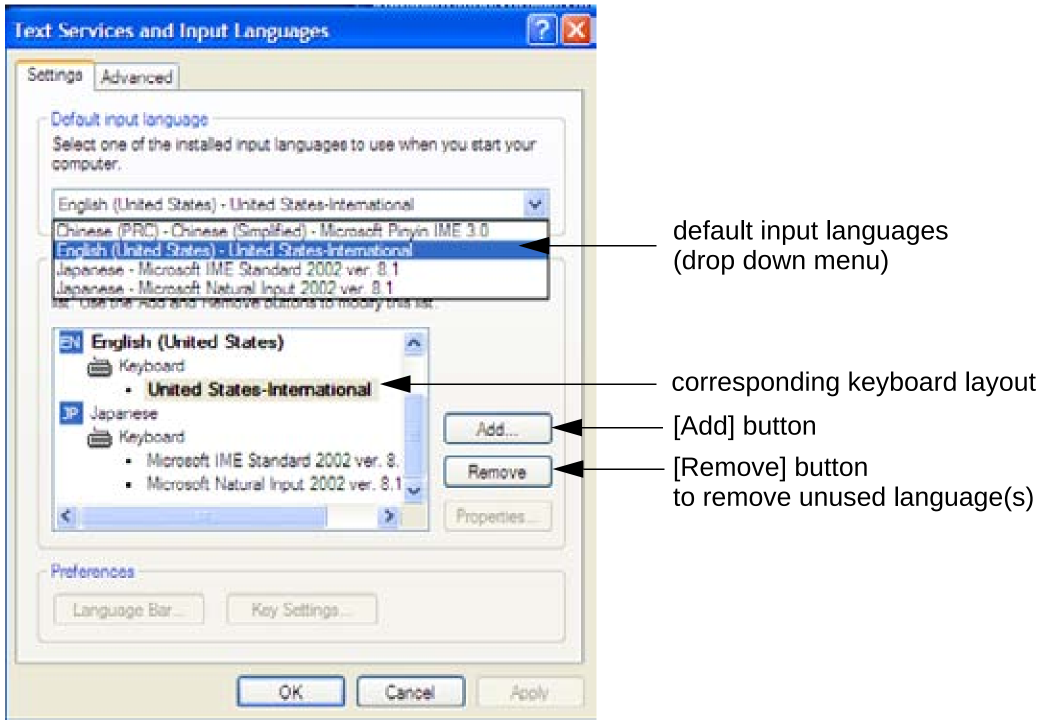


Figure 6-11 Default input language

NOTE: If the desired language is not listed, click the ADD button, choose the desired input language from the drop down menu, as shown in Figure 6-12 below, and then confirm with OK.

(The corresponding keyboard layout is shown automatically.).

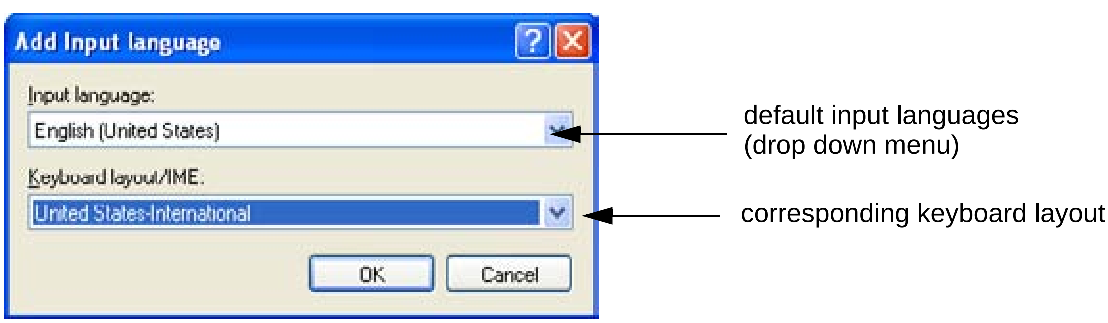


Figure 6-12 Default Keyboard Settings and Input Locale Properties

7.) If not already done, select the default input language from the drop down menu (see: Figure 6-11). The corresponding keyboard layout is changed automatically.

8.) Click on **APPLY** and then close the window with **OK**.

9.) Close the Service page with the **SAVE & EXIT** and restart the system.

10.) Reenter “Keyboard Layout” by repeating step 1.) to step 6.). This time remove unused language(s)

11.) Test the Keyboard function:

- Press the ABC key on the control panel.

- Press some keys on the keyboard and verify the entered text.

Chapter 7
Diagnostics/Troubleshooting

Section 7-1
Overview

7-1-1 Purpose of Chapter 7

This section describes how to setup and run the tools and software that help maintain image quality and system operation. Basic host, system, and board level diagnostics are run whenever power is applied. Some Service Tools may be run at the application level.

7-1-2 Overview

There may be a time when it would be advantageous to capture trouble images and system data (logs) for acquisition through remote diagnostics or to be sent back to the manufacturer for analysis. There are different options to acquire this data that would give different results.

Table 7-1 Contents in Chapter 7

Section 7-2
Collect Vital System Information

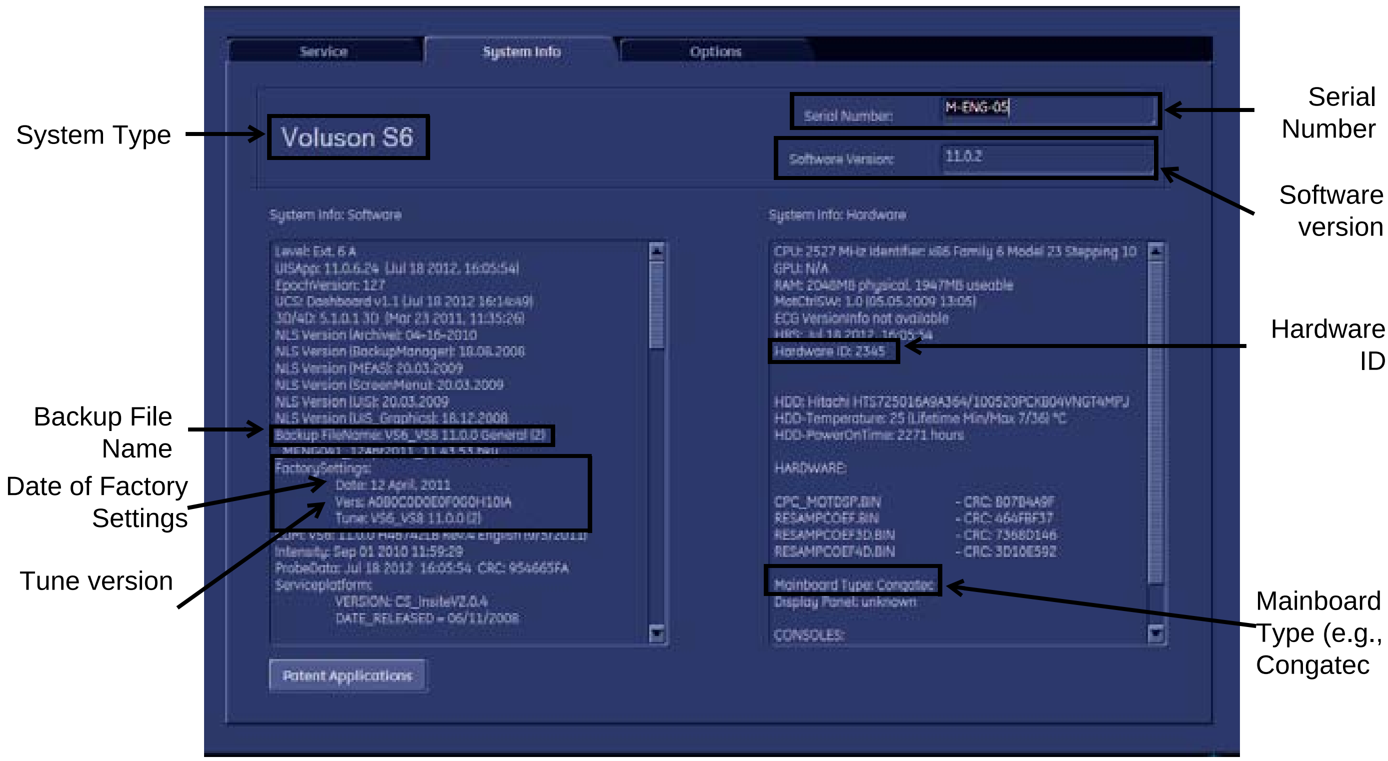
1.) Press the **UTILITIES** key on the control panel.
2.) In the “Utilities” menu select SYSTEM SETUP to invoke the setup desktop on the screen.
3.) On the left side of the screen select ADMINISTRATION and then click the **SYSTEM INFO** tab.

The following information is necessary in order to properly analyze data or images being reported as a malfunction or being returned to the manufacturer:

- **System Type**
- **System Serial number** (also visible on label on the back of the system)
- **Application Software version**
- **Backup Version** (File Name, Date of Factory Settings, Tune version, etc.)
- **additional information** (e.g., Hardware ID, “Mainboard Type”, HW configuration, etc.)

NOTE: All the above information can be found in the System Info page; see: Figure 7-1 on page 7-3.

Section 7-2 Collect Vital System Information (cont'd)



Move the scroll bars downwards to view additional information about installed software/hardware (e.g., Console information).

Figure 7-1 System Setup - Administration - SYSTEM INFO page (e.g., VS8)

7-2-1 Request for Service (RFS)

NOTICE Service Connectivity has to be checked out once before you can request for service.
i.e., Service platform has to be configured properly; see: CSD: Configuration on page 7-14.

There are two possibilities to contact GE:

- by means of the GE “Remote Status Icon” that is displayed on the bottom of the screen.

Move the cursor to the GE icon and press the **left trackball key** (= left-click) to display the “Request For Service” form (see: Figure 7-2 below).

- via the System Setup - SERVICE page

1.) Press the **UTILITIES** key on the control panel.
2.) In the “Utilities” menu select SYSTEM SETUP to invoke the setup desktop on the screen.
3.) On the left side of the screen select ADMINISTRATION and then click the **SERVICE** tab.
4.) Enter the password SHE and click the ACCEPT button to display the Service Tools window.
5.) Click the RFS button and fill out the displayed form. (Enter detailed Problem description.)

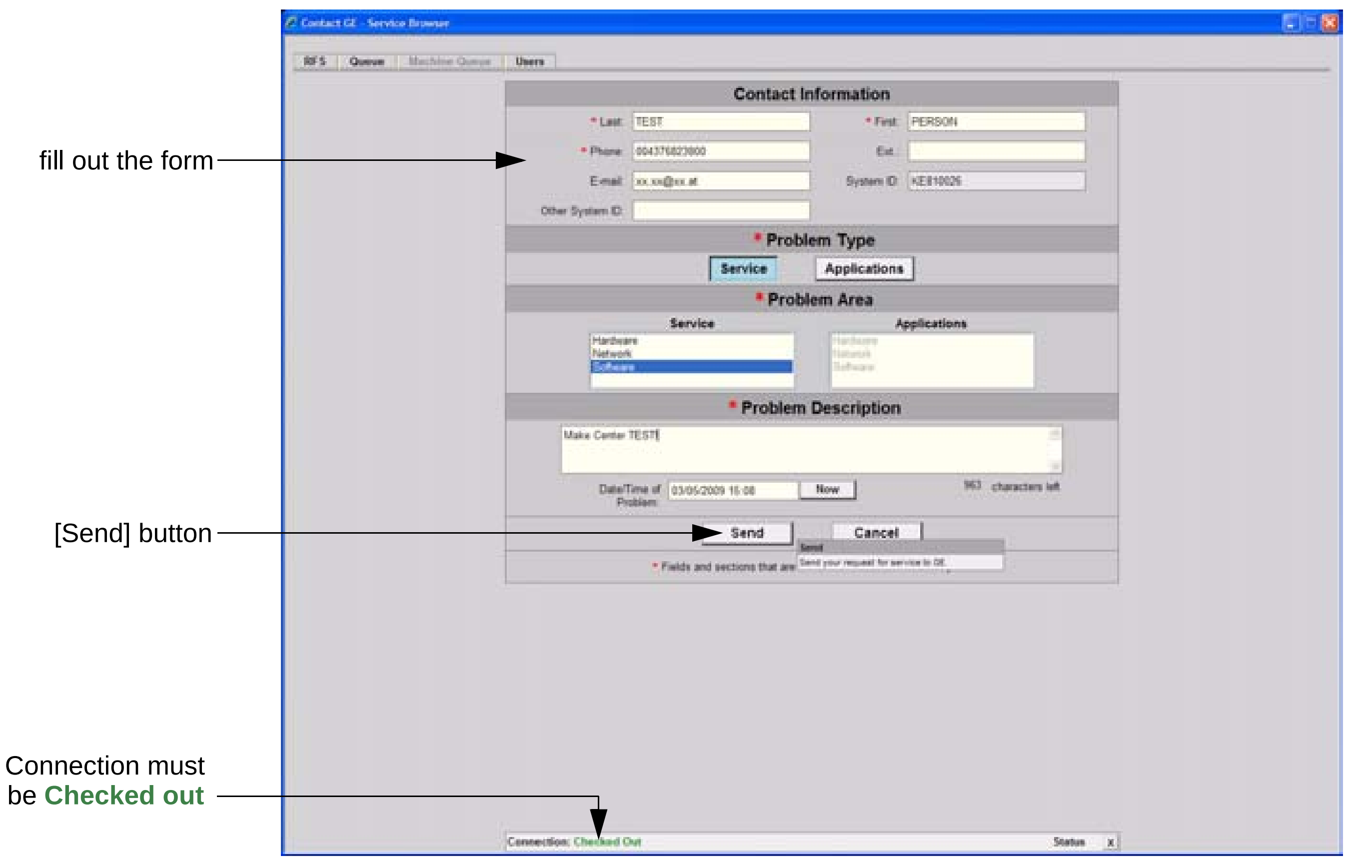


Figure 7-2 Contact GE - Request for Service

4.) Click the SEND button to send the problem description to GE Service/Application representatives.

7-2-1 Request for Service (RFS) (cont'd)

A request confirmation screen is displayed:

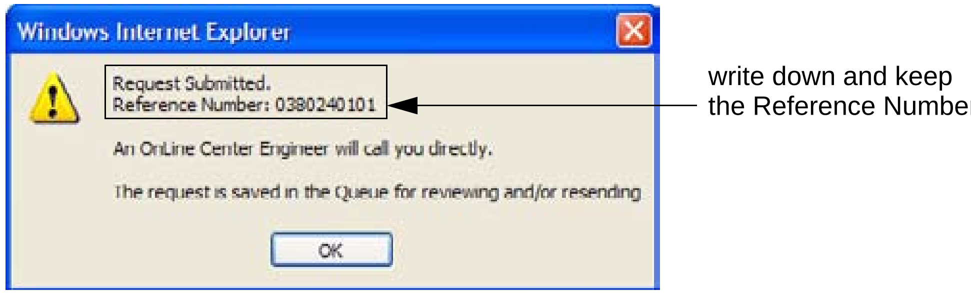


Figure 7-3 Request submitted

5.) Write down and keep the Reference Number for follow up procedures, then click OK.

NOTE: If the service platform is not configured an Error message is displayed. The request is **NOT sent**!

The request is saved in QUEUE for reviewing and/or resending.

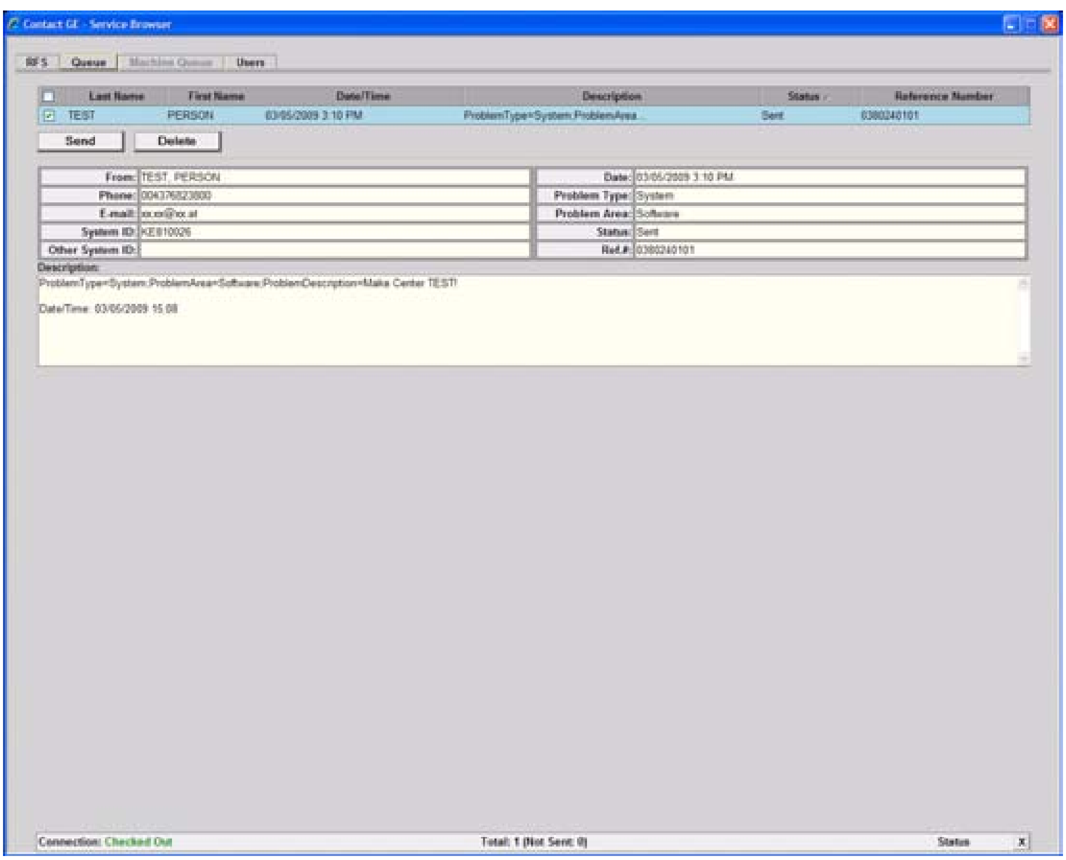


Figure 7-4 Contact GE - Queue

7-2-2 Shortcuts List

Press the **CTRL** + **H** key simultaneous to display the shortcuts list and a description of what they do.

Figure 7-5 Shortcut list (Ctrl + H)

Shortcut	Description
Ctrl + C	copy text
Alt + D	export system state (Full Backup and Dump files)
Ctrl + H	shortcuts list (see: Figure 7-5 above)
Alt + P	stores screenshot on D:\export
Ctrl + V	paste, insert text from clipboard
Ctrl + X	cut text
Ctrl + Z	undo typing
Alt + F5	create process logger snapshot
Alt + F6	burn process logger snapshot to CD
Alt + F7	start/stop process logger
Shift + F11	start remote socket control
Alt + F11	stop remote socket control
Alt + Backspace	undo typing
Shift + Delete	cut text
Shift + Insert	insert text (paste)
Ctrl + Insert	copy text

Section 7-3
Check Points Voltages

7-3-1 How to check power

7-3-1-1 Common Power Supply (CPS)

Turn on mains switch and check green LED inside Power.

Figure 7-6 Check green LED inside CPS

NOTE: If LED is on, CPS has full function (all voltages are within the specified range).

Section 7-4
Screen Captures and Logs

There may be times when the customer or field engineer will want to capture a presentation on the screen so it may be recovered by the OnLine Center. This is accomplished by saving the image(s):

A.) to Archive and export them (as jpg, bmp or tiff) to DVD/CD+R/RW or external USB drive.

B.) as jpg and bmp to D:\export by pressing the **ALT** + **P** key on the alphanumeric keyboard.
Note: Successive **ALT** + **P** keystrokes (max. 20) overwrite existing snapshots at destination HDD!

C.) creates one snapshot (Alt-D.bmp) + “Full Backup” of the System state (fullbackup -> fb1) saved by pressing the **ALT** + **D** key on the alpha-numeric keyboard.

7-4-1 Capturing a screen

The following is the generic process to capture any screen from the scanner.

1.) Navigate to, and display the image/screen/volume to be captured.

2.) Press the **P1**, **P2**, **P3** or **P4** key (depending on system configuration) on the control panel and store the image onto the clipboard (frame on left side of the screen).

NOTE: *A short summary of* ***P1****,* ***P2****,* ***P3*** *and* ***P4*** *key´s configuration is shown in the status area on the screen.*

Figure 7-7 summary of keys configuration

3.) Select the stored image(s) and export them to DVD/CD+R/RW, an external USB drive (optional) or mapped Network drive (jpg, avi, mov, bmp, tif, Voluson format file, Volume files and DICOM files).

7-4-2 Export Log’s and System Data

There are two possibilities to export system data (and log´s):

1.) by pressing the **ALT** + **D** key to save a snapshot and “Full Backup” of the System state; see: Section 7-4-2-1 on page 7-8

2.) via the EXPORT SYSTEM DATA button in the System Setup - Administration - **SERVICE** page; see: Section 7-4-2-2 on page 7-10

7-4-2-1 Export System Data (by pressing the ALT + D key)

ALT + **D** uses “Full Backup” to gather data from the system. In addition it creates one screenshot (Alt-D.bmp) of the point in time when **ALT** + **D** was pressed.
The main use is when R&D or OLC need detailed information about the system (e.g., when experiencing strange behaviour or when the problem should be investigated by R&D).
It is **not** intended to replace or enhance the existing Full Backup functionality.

Data can be stored on the hard disk (D:\export\fullbackup\fb1), or you can export them to DVD/CD. Including the D:\export folder, which contains dump files (for details see: Section 7-4-2-2-1), Process Logger files, Autotester files, SMART logs and Screenshots [Alt + P].

NOTE: *Successive* ***ALT*** *+* ***D*** *keystrokes overwrite existing snapshots (Alt-D.bmp) at destination HDD.*

1.) Press the **ALT** + **D** key on the keyboard simultaneously.

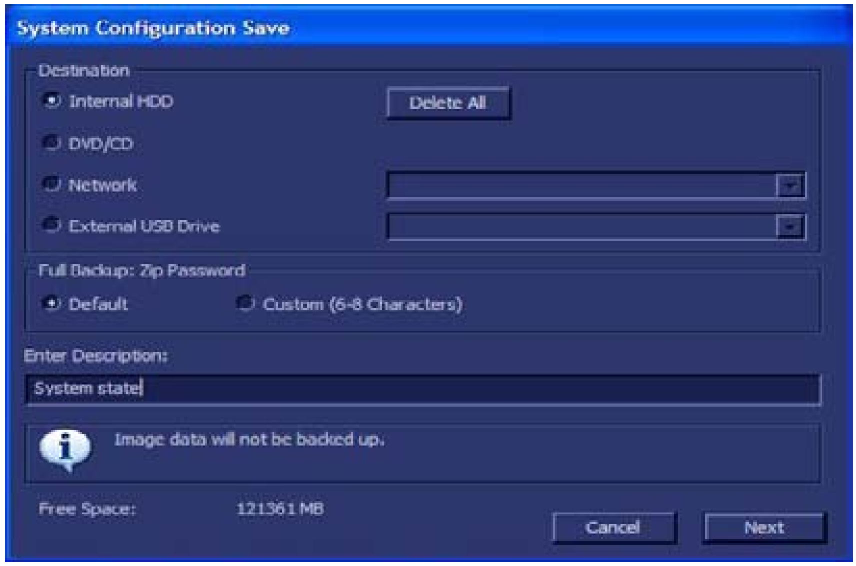


Figure 7-8 select destination for “System state” backup

2.) Select the destination of the “System state” backup.

3.) Select the NEXT button to start the backup process.

After saving the data, the Voluson® S8 / Voluson® S6 reboots and the application starts again.

7-4-2-2 Export Log´s and System Data (via Service Page)

1.) Press the **UTILITIES** key on the control panel.
2.) In the “Utilities” menu select SYSTEM SETUP to invoke the setup desktop on the screen.
3.) If not already done, connect the USB “standard GE” service dongle to the front USB connector(s). As soon as the dongle is detected the login window pops up.
4.) Enter the “Standard GE Revolving” password (changes every six months) and then click ENABLE.
5.) On the left side of the screen select ADMINISTRATION and then click the **SERVICE** tab.
6.) Click the SERVICE TOOLS button on the Service window to get access to the “Service Tools” page.

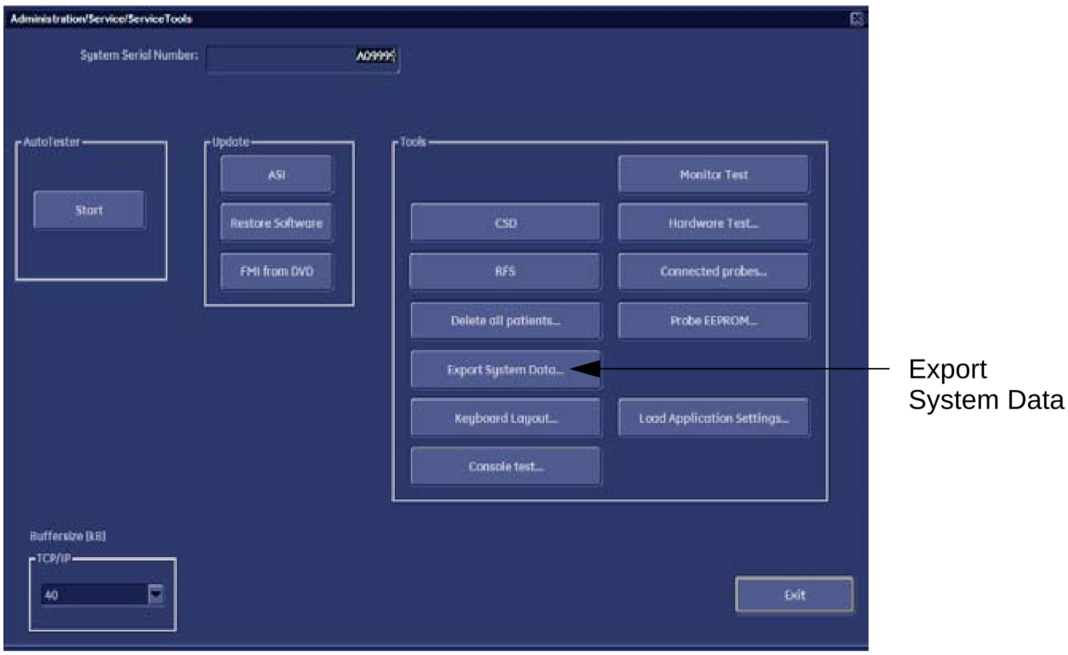


Figure 7-9 Service Tools window

7.) Click on the EXPORT SYSTEM DATA... button to Full Backup the System State. This includes dump files (see: Section 7-4-2-2-1) and text files, full Service Database informations about probes, boards, Software, Options and the Event Log File.

7-4-2-2-1 Dump-file

Every time an error message like Figure 7-10 is produced, a dump-file and a text file containing the error dump and the error message are created in D:\export. Up to 20 dump files are stored there.

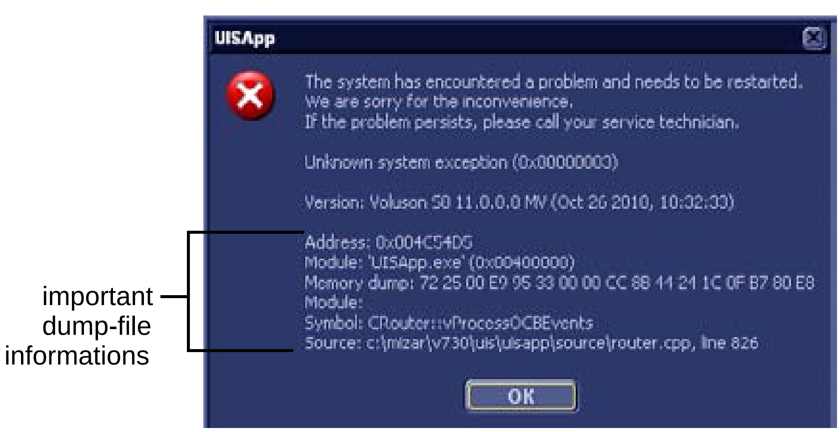


Figure 7-10 system has encountered a problem

After clicking on OK the system reboots automatically.

Section 7-5
Remote Access to Service Platform

7-5-1 General

This offers GE technicians the possibility to view the entire customer´s desktop and operation system. Using VCO (Virtual Console Observation) a service technician or the OnLine Center can access and modify all PC settings and programs or run diagnostics on the customer´s ultrasound scanner.

NOTICE Remote access is **ONLY possible if the service platform is properly configured** (either by the user or a GE technician at site). Operation see: Section 7-5-4 "CSD: Configuration" on page 7-14.

Remote access to the Voluson® S8 / Voluson® S6 scanner requires permission and customer input before a GE service technician or OLC can access the customer's ultrasound scanner remotely.

"Disruptive Mode" can be selected by the customer directly on the Voluson® S8 / Voluson® S6 ultrasound system (see: Section 7-5-2 on page 7-12), or remotely by the service technician or OLC.

7-5-2 How the Customer enables/disables Disruptive Mode and VCO

1.) If not already in read mode, **FREEZE** the image.
2.) Move the cursor to the GE icon and press the **right trackball key** (= right-click).
3.) Select ***Connect Clinical Lifeline*** (see: Figure 7-11 below).
This activates "Disruptive Mode" and "VCO" for the application OLC to quickly assist the customer.

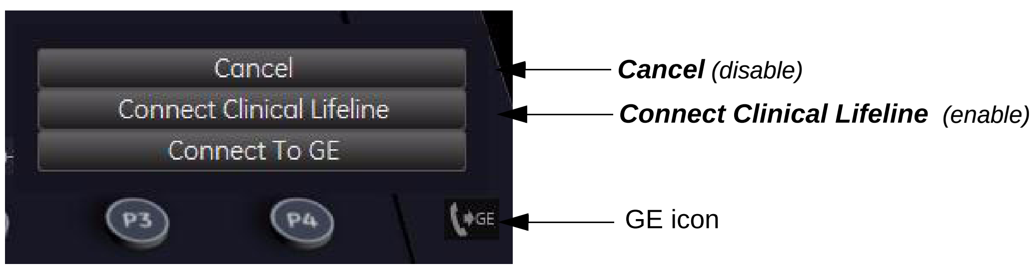


Figure 7-11 Connect Clinical Lifeline

NOTICE The ACTIVATE SERVICE button in in the Service Tools page (see: Figure 7-9 on page 7-10) also activates/deactivates "Disruptive Mode" and "VCO".

NOTE: Visual information about the network status is shown in the status area on the bottom of the screen.

 Gray = **Idle State**	Remote access is inactive.
 Green = **Active State**	Disruptive Mode and Virtual Console Observation (VCO) is enabled, but there are no active incoming connections.
 Orange = **Disrupted State**	Remote Access is active. All processes [UL_VNC and UL_CSD] are active. In this state the Voluson® S8 / Voluson® S6 system should NOT be used clinically.

4.) If you select ***Cancel***, "Disruptive Mode" and "VCO" is turned OFF.

7-5-3 Common Service Desktop (CSD)

As soon as the Common Service Desktop (CSD) is started, the Service **[Home]** Page appears.

Figure 7-12 Common Service Desktop - Home

NOTE: As described in Chapter 5 - Common Service Desktop (CSD), on page 5-51, the service platform uses a web-based user interface (UI) to provide access to common service components.
The Service platform is designed for GE personnel and as such is in English only.
There is no multi-lingual capability built into the Service Interface.

7-5-4 CSD: Configuration

7-5-4-1 To configure Service Platform

⚠ **NOTICE** If a Proxy server is available, the **information MUST be properly entered, otherwise remote control does not work**. There is no possibility to detect proxy server information automatically.

1.) Ask the hospital's network Administrator for the Proxy Server Address and the Proxy Server Port.
2.) Select the **Configuration** page, then double-click "InSite ExC Agent Configuration".
3.) Fill out all **bold** stated "mandatory" fields.
4.) Enter Proxy Server Address and Proxy Server Port.

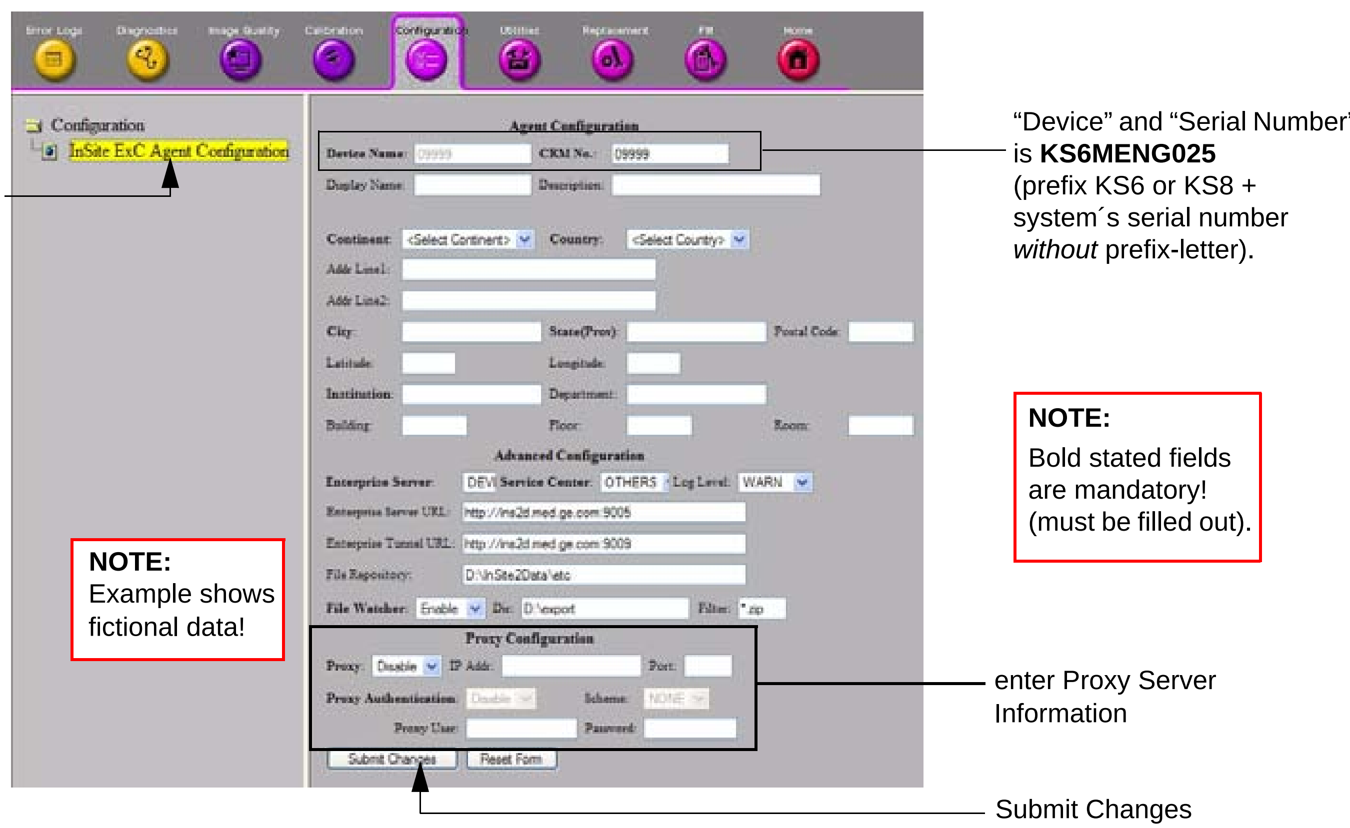


Figure 7-13 Common Serive Desktop - Configuration

5.) Click the SUBMIT CHANGES button and then close the service page.

Section 7-6
How to use the Auto Tester program

1.) Press the **UTILITIES** key on the control panel.
2.) In the “Utilities” menu select SYSTEM SETUP to invoke the setup desktop on the screen.
3.) If not already done, connect the USB “standard GE” service dongle to the front USB connector(s). As soon as the dongle is detected the login window pops up.
4.) Enter the “Standard GE Revolving” password (changes every six months) and then click ENABLE.
5.) On the left side of the screen select ADMINISTRATION and then click the **SERVICE** tab.
6.) Click the SERVICE TOOLS button on the Service window to get access to the “Service Tools” page.

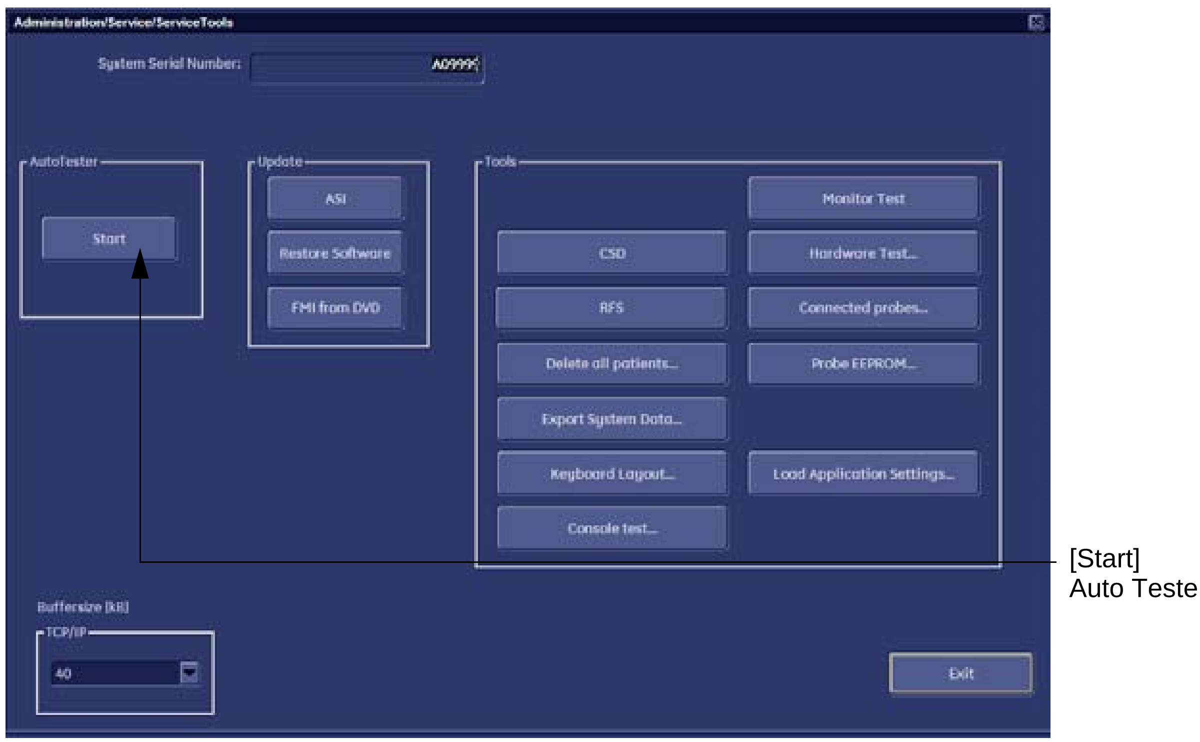


Figure 7-14 Service Tools window

7.) Activate the “Auto Tester” program by clicking START.

Section 7-6 How to use the Auto Tester program (cont'd)

The following message box appears.

Figure 7-15 Message Box

8.) Click OK.

9.) Press the **ALT GR** key on the alphanumeric keyboard.

10.) Activate the "Auto Tester" program by clicking the "Record" icon on the displayed screen.

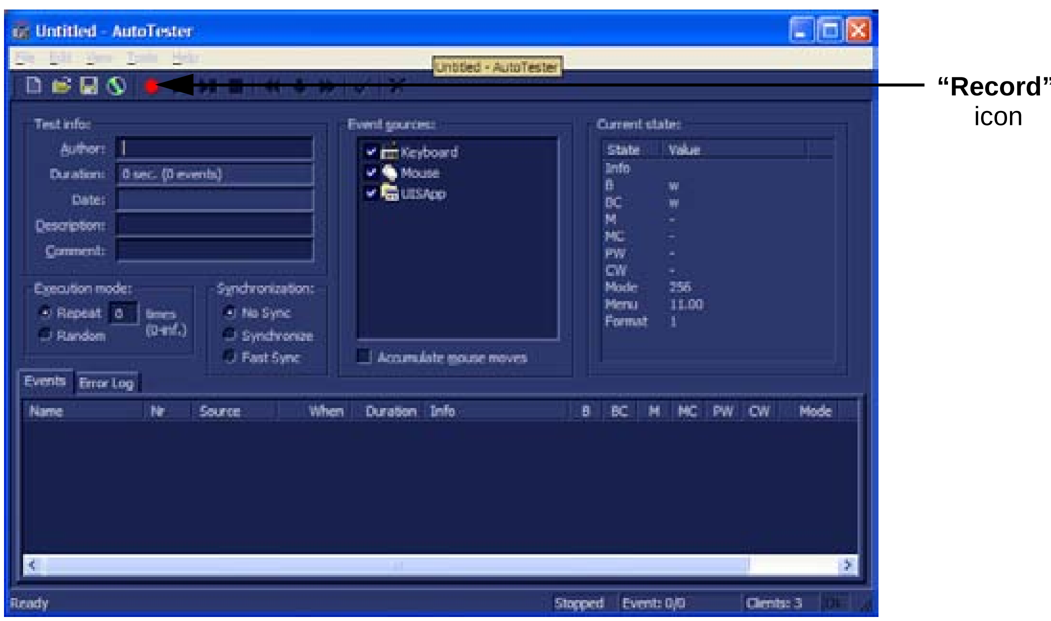


Figure 7-16 Start Auto Tester

11.) Start scanning.
You can scan normally and everything will be recorded to the program (up to several hours.)

NOTE: It is important that you are recording the processes where the errors normally occur.

Stop the program by clicking on [Stop] shown on the screen,
or by pressing the **ALT GR** key on the alphanumeric keyboard.

Section 7-6 How to use the Auto Tester program (cont'd)

The following screen will appear.

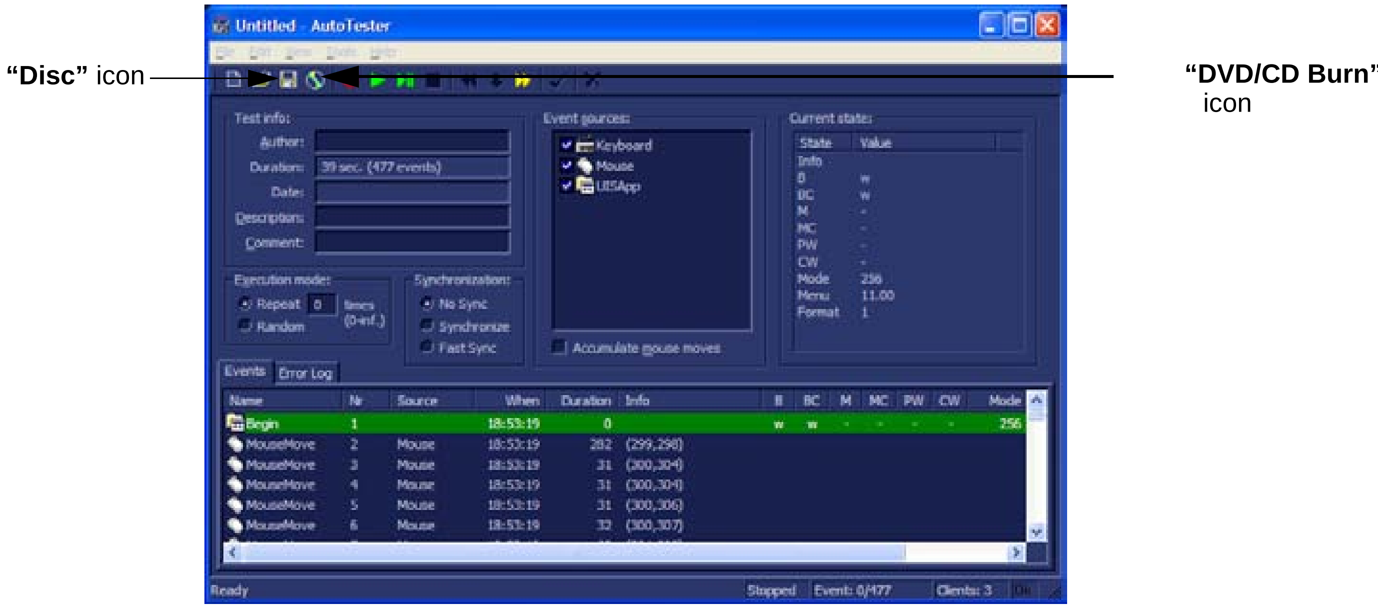


Figure 7-17 Auto Tester Finished

12.) Insert an empty DVD/CD+R/RW in the Drive and select the "DVD/CD Burn" icon. Or hit "Disc icon" to save to export.

13.) Enter a Filename.

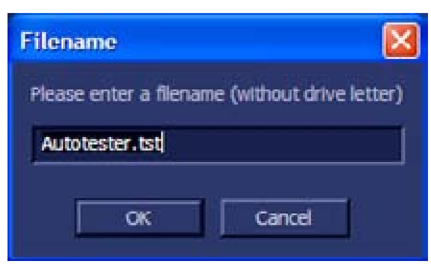


Figure 7-18 Enter a Filename

14.) After clicking OK, the following message boxes will appear.

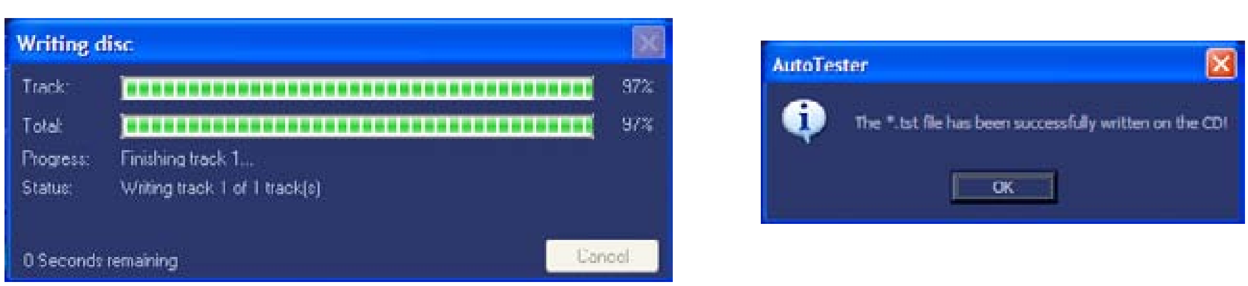


Figure 7-19 CD Burn Process

15.) After the DVD/CD write is finished click the OK button and then close the "Auto Tester" program.

Section 7-7
Troubleshooting Trees, Instructions and Tech Tips

Table 7-1 below outlines Voluson® S8 / Voluson® S6 troubleshooting trees and instructions shown in the sub-sections.

Table 7-1 Troubleshooting Trees and Instructions

Sub-section	Description	Page Number
7-7-1	System does not boot up	7-19
7-7-2	Noise disturbs the Image	7-20
7-7-3	Trackball - Impaired Sensitivity	7-21
7-7-4	Printer Malfunction	7-22
7-7-5	Monitor Troubleshooting	7-23
7-7-6	DVD/CD+R/RW Drive Test	7-24
7-7-7	Network Troubleshooting	7-26
7-7-8	Tech Tips	7-27

7-7-1 System does not boot up

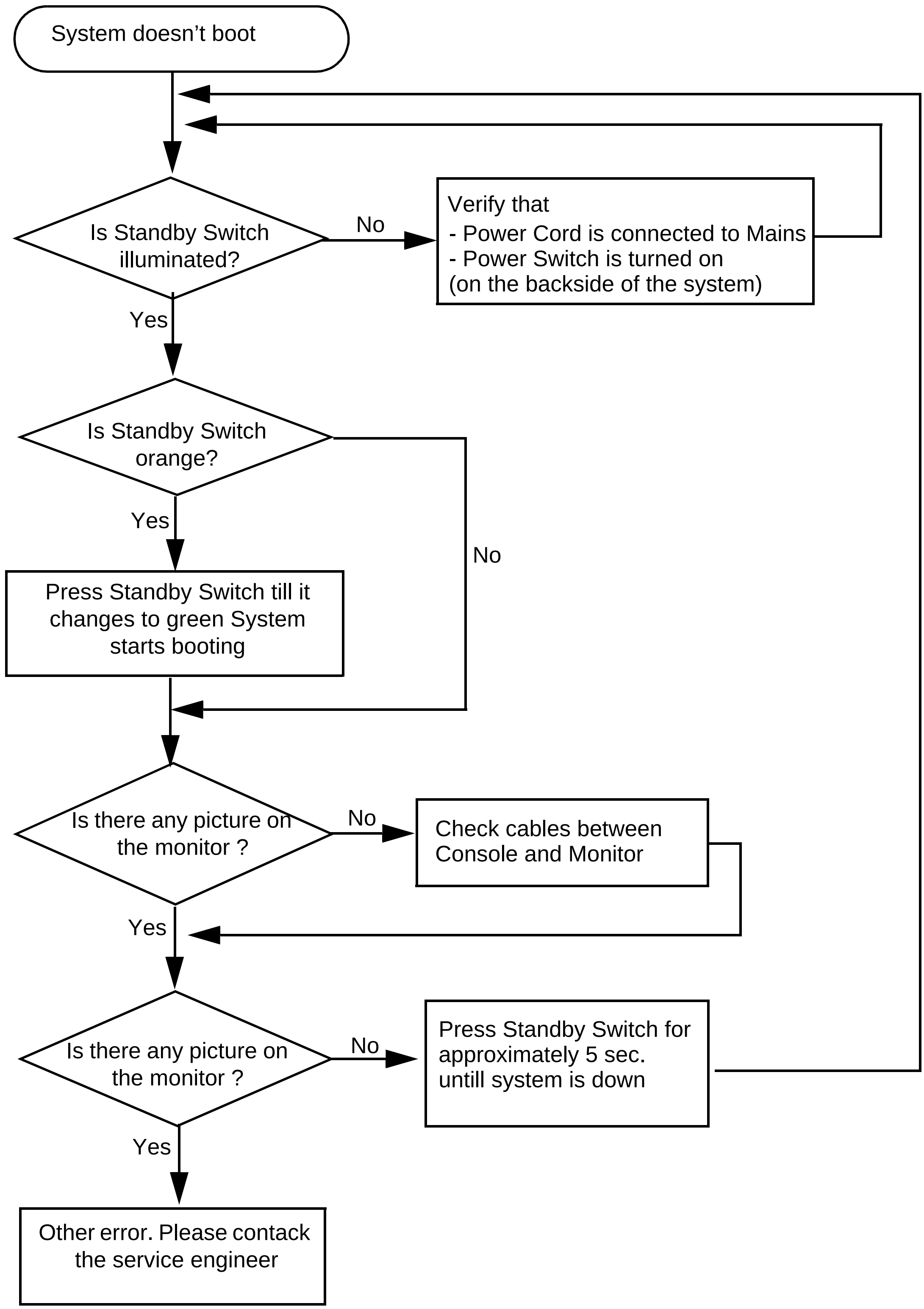


Figure 7-20 System does not Power On / Boot Up

7-7-2 Noise disturbs the Image

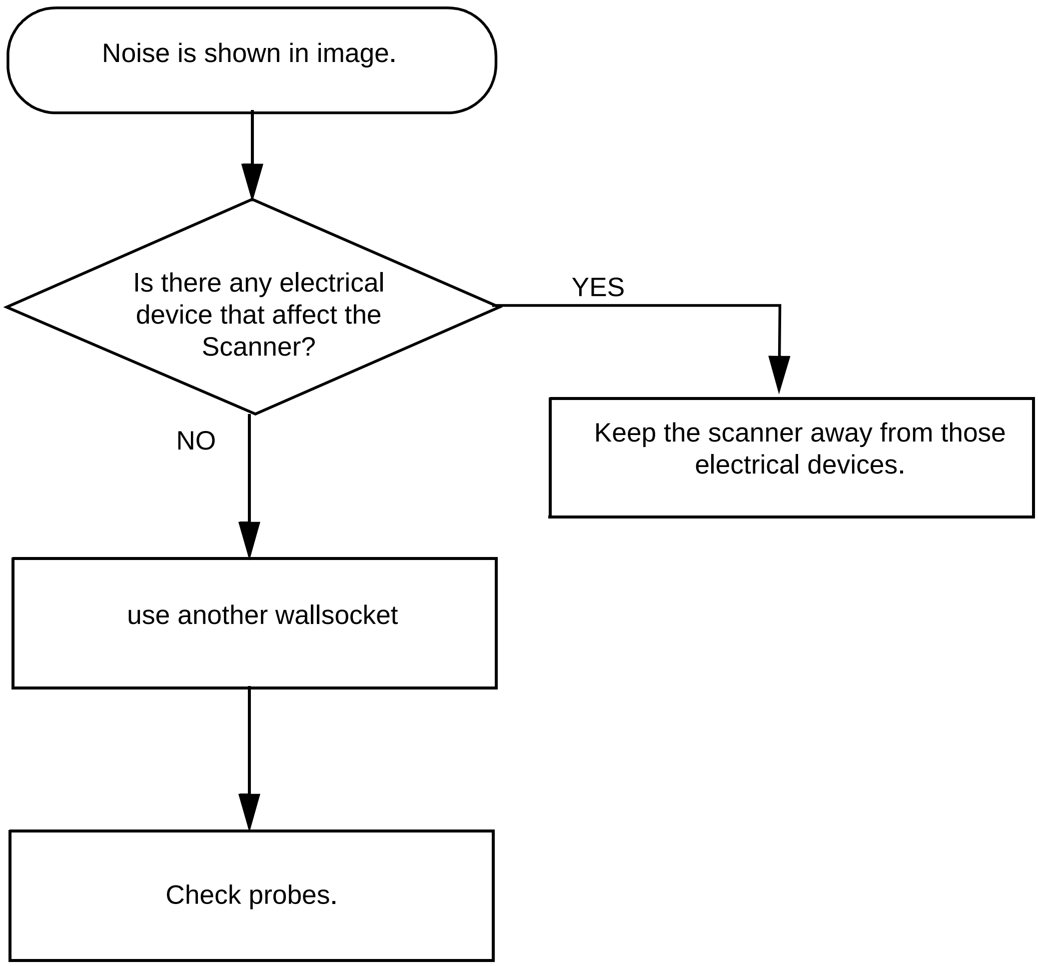


Figure 7-21 Noise disturbs the Image - Troubleshooting

7-7-3 Trackball - Impaired Sensitivity

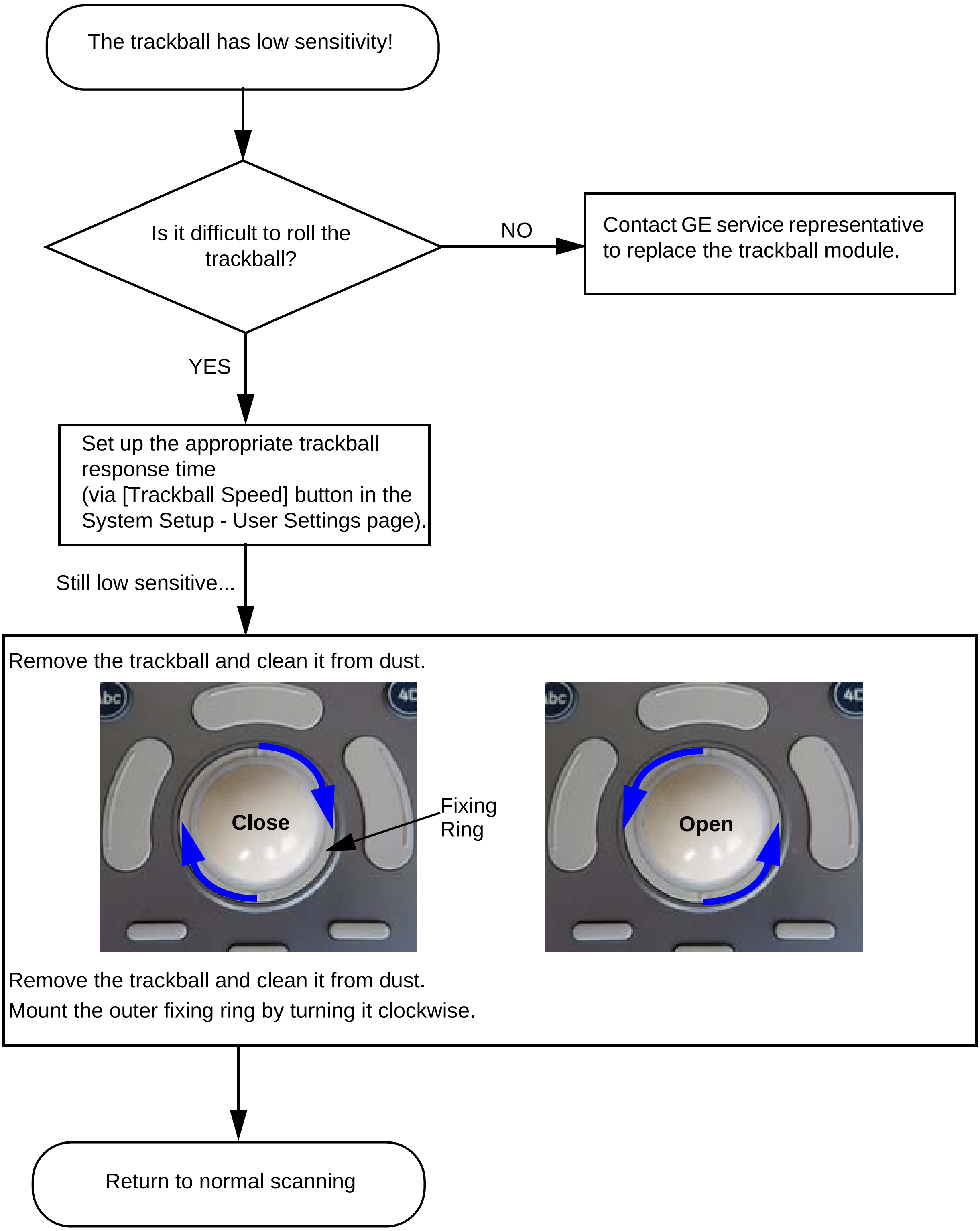


Figure 7-22 Trackball - Impaired Sensitivity

7-7-4 Printer Malfunction

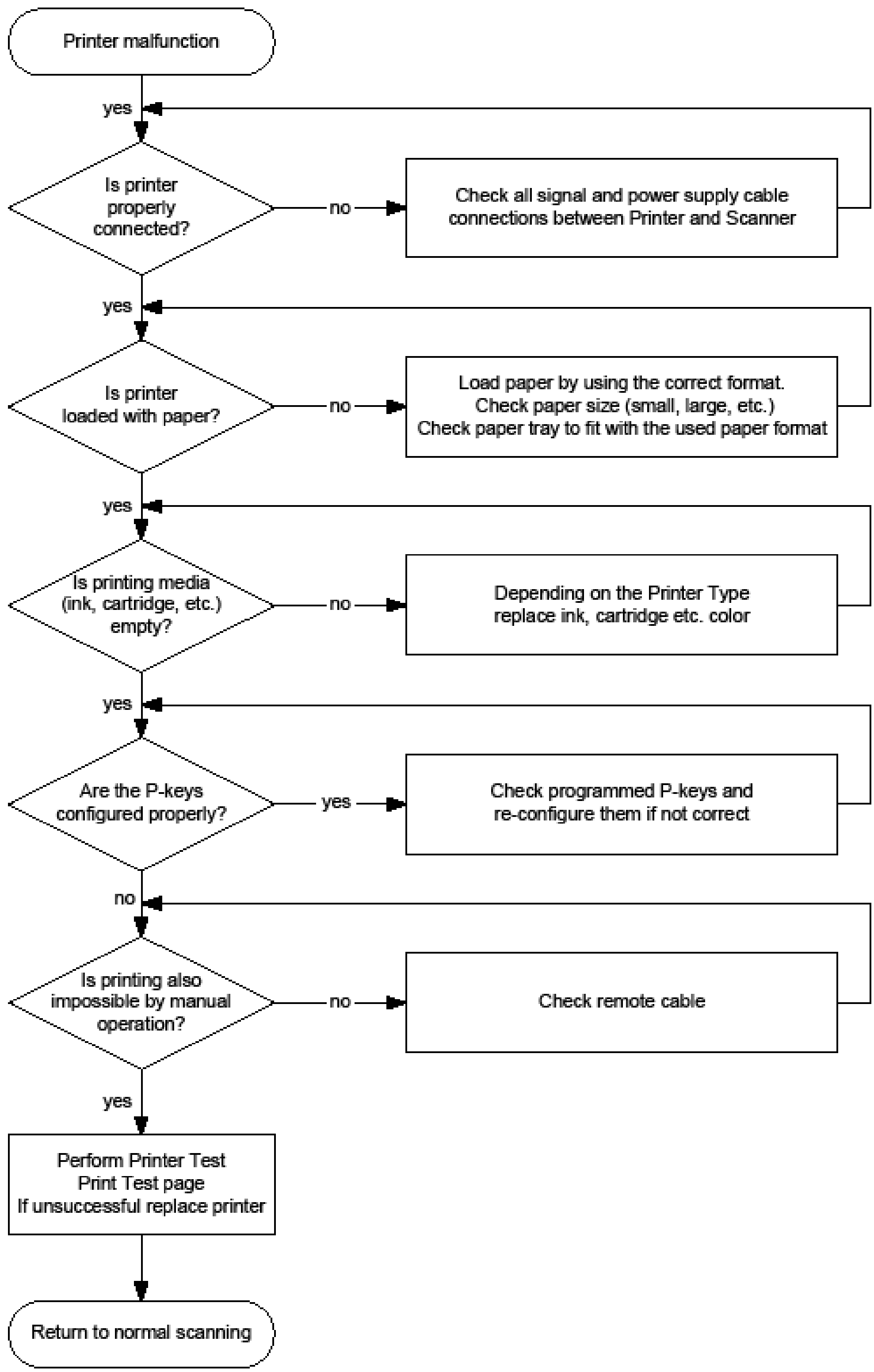


Figure 7-23 Printer Malfunction

7-7-5 Monitor Troubleshooting

Fault symptom	Check these items
No image/No signal	Check the main panel cable is properly connected to Monitor.
	Check the main panel cable is properly connected to RFS.
	Check no pins of the main panel cable are bent.
Video test pattern are not clear, bright parallel or square	Replace the monitor.

For further details refer to Section 6-3 "LCD Monitor Adjustment" on page 6-2.

7-7-6 DVD/CD+R/RW Drive Test

NOTE: Only DVD+R/RW and CD+(R)W medias are available.

1.) Insert an empty DVD/CD+R/RW into the Drive.
2.) Enter “Patient Archive” by pressing the **PATIENT ID** key on the control panel.

Figure 7-24 Patient Archive - ARCHIVE

3.) On the left side of the screen select ARCHIVE as shown in Figure 7-24 ABOVE.
4.) If not already selected, choose Source “Local Archive” Drive from the pop-up menu.
5.) Select an Exam (with images).

7-7-6 DVD/CD+R/RW Drive Test (cont'd)

6.) Export images of the selected exam to DVD/CD+R/RW:

a.) Click the EXPORT button.

b.) If not already selected, choose "DVD/CD" drive from pop-up menu.

c.) Enter "File name".

d.) Select any Voluson Format (***.4dv**) from the pop-up menu.

e.) Click the SAVE button.

Figure 7-25 Export images to DVD/CD - as *.4dv format

7.) After successful export, choose Source "4DV" from the pop-up menu.

8.) The images, which you have chosen to export should be visible.

7-7-7 Network Troubleshooting

7-7-7-1 No Connection to the Network at All

	Gray = Cable disconnected or no network signal on a connected cable.
	Green = Cable connected to a network. **Does not imply** proper network settings.

1.) Check that the network cable between the Voluson® S8 / Voluson® S6 system and the wall network is connected and well seated in both ends. (Use a network cable that is known to be OK.)

2.) Connect a network cable between the system and a PC by either using a hub or a cross-over cable. Try to ping from system to IP address on PC. If OK, hardware connection inside the system is OK.

7-7-7-2 GE remote service connection

The customer gets visual information about GE remote service status (shown in the status area on the right bottom of the screen).

GE	Gray = **Idle State**	Remote access is inactive. No InSite services are running.
GE	Green = **Active State**	Disruptive Mode and Virtual Console Observation (VCO) is enabled, but there are no active incoming connections.
GE	Orange = **Disrupted State**	Remote Access is active. All processes [UL_VNC and UL_CSD] are active. In this state the Voluson® S8 / Voluson® S6 system should NOT be used clinically.

7-7-8 Tech Tips

Use Table 7-2 below to access Voluson® S8 / Voluson® S6 (troubleshooting) Technical Tips listed. Each entry in the table will hyper-link to the issue, cause and solution.

Table 7-2 Technical Tips

Sub-section	Description	Page Number
7-7-8-1	Storing SonoView images to Voluson® S8 / Voluson® S6	7-27

7-7-8-1 Storing SonoView images to Voluson® S8 / Voluson® S6

Issue: Storing SonoView images from Voluson® 730/Expert/Pro/ProV to Voluson® S8 / Voluson® S6

Cause: Archive is different (no SonoView on Voluson® S8 / Voluson® S6)

Solution: 1.) Perform SonoView Backup on Voluson® 730/Expert/Pro/ProV to external hard disk (USB) or DVD
2.) Import File "V730.mdb" from external hard disk (USB) or CD/DVD on Voluson® S8 / Voluson® S6

Procedure:

1.) Connect external hard disk or insert CD/DVD on the Voluson® S8 / Voluson® S6.
2.) Open Archive --> select "Data Transfer" --> "Import". The "Open File" window appears

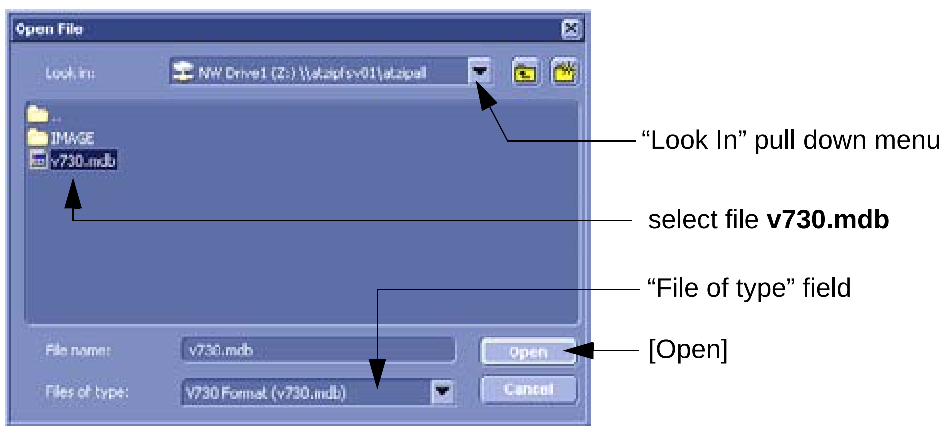


Figure 7-26 Open File

3.) Select Drive in the “Look In” pull down menu.
4.) In the “File of type” field change file type to “V730 Format (v730.mdb)”.
5.) Browse for the folder where SonoView Backup was stored.
6.) Select file "v730.mdb" and then click OPEN.

Section 7-8
Error Messages

NOTICE If the problem (error message) still exists after performing the described actions, call technical support.

Error Messages	Actions
3D B_RxLines exceeded! Action: restart the system	restart the system
3D B-O_Frames exceeded! Action: restart the system	restart the system
3D C_RxLines exceeded! Action: restart the system	restart the system
3D C-O_Frames exceeded! Action: restart the system	restart the system
530-probe connected on upper-left probe connector (CW)	Connect another Probe
A USB-drive has been removed without stopping it. Unplugging or ejecting devices without first stopping them can often cause crashes and lose valuable data.	press Ok, and stop it before removing it next time
AcquMode - incorrect BBC_Wnd pointer	restart the system
Another drive is already assigned to "xx" that is no DVD/CD rec. Cannot swap assignment.	Use a DVD/CD writer
Application setting ApodTable field count mismatch	restart the system
Application setting dynamic set field count mismatch	restart the system
Application setting field count mismatch	restart the system
Application setting RxFrqResponse field count mismatch	restart the system
AVI Save function fails Action: check the connection and Power cable - restart the machine and try again	see error message
B_Enhance Out Of Range	press ok and save this user-setting once again
B_Gain Out Of Range	press ok and save this user-setting once again
B_Reject Out Of Range	press ok and save this user-setting once again
B_TxFocus - not calculated and B_SHOT_PART_ON	restart the system. If after restart not ok then call technical support
backward steps calculated in bGetUnitByStamp out of range	restart the system
BBC_Acquisition Wnd - block creation failed Action: restart the system	restart the system
BBC_Acquisition Wnd - incorrect ReplayCtrl-object Action: restart the system	restart the system
BBC_Archive Wnd - incorrect ReplayCtrl-object	restart the system
Backup error while writing. (Error during writing of backup data.)	check storage destination for Full Backup (e.g., DVD/CD not empty, insufficient rights on target Network drive, write protection on USB-drive)
Backup error while verifying. (Checksum mismatch)	repeat backup

Error Messages	Actions
BC Ensemble Out Of Range	press ok and save this user-setting once again
BC lines_per_sequenz < 1 Action: restart the system	restart the system
BC_Dynamic Out Of Range	press ok and save this user-setting once again
BC_Gain Out Of Range	press ok and save this user-setting once again
BC_Lines: BC_LineDensity out of limit	restart the system
BCMC_Balance Out Of Range	press ok and save this user-setting once again
bCP_ConvertParameters failed	restart the system
bCP_ConvertParameters failed Action: restart the system, If after restart not ok then call technical support	restart the system
bCP_ConvertParameters failed. Action: restart the system, If after restart not ok then call technical support	restart the system
bCP_ProcessIQEnsemblePacket failed Action: restart the system, If after restart not ok then call technical support	restart the system
bCP_ProcessIQMModePacket failed	restart the system
B-DynContrast Out Of Range	press ok and save this user-setting once again
BF: can't set BM RxApod	restart the system
BF: can´t set C Rx Apod	restart the system
BF: can't set D RxApod	restart the system
binary file not found Action: restart the system	restart the system
Binary path not set	restart the system
BM_Resample: overrun SampleLengthOnLineMem	restart the system
bPWCW_ProcessPWCWData in RT_PWorCWFilterBlock::bFilteredSamples AddedToWorkingBuffer() returned error code xxx!! Action: restart the system, If after restart not ok then call technical support	restart the system
Can not create test report data	restart the system
Can not send test report	check DÍCOM server configuration
cannot allocate memory	restart the system
Cannot create instance	restart the system
cannot open file	restart the system
Cannot read a valid Probe-ID (xx) from Attempt to read Probe-ID from an invalid probe connector. Action: restart system	restart the system, connect another probe
Cannot read a valid Probe-ID (xx) from left probe connector (A).	Connect another probe
Cannot read a valid Probe-ID (xx) from middle probe connector (B).	Connect another probe
Cannot read a valid Probe-ID (xx) from right probe connector (C).	Connect another probe
Cannot read a valid Probe-ID (xx) from lower-left probe connector (cw).	Connect another probe

Error Messages	Actions
cannot read file	restart the system
Cannot import volume data to 3D dll Action: Load volume files from other storage medium. Call technical support	Load volume files from other storage medium.
Can't add chosen files to the virtual folders!	restart the system
Can't create hardware configuration index file in D:\\SERVICE Action: restart the system	restart the system
Can't detect PCI 9054	restart the system
Can't find %s() dll function in Mizar_IntensityMeasureData.dll	restart the system
Can't import disc session. Action: use a new CDR to write data to CD, if not ok call technical support	use a new DVD/CD+R to write data to DVD/CD
Can't load Mizar_IntensityMeasureData.dll	restart the system
Can't open:	restart the system
Can't open: patterndat.bin Action: restart the system	restart the system
Can't open: resampcoef.bin Action: restart the system	restart the system
CHA PulseInversion flag for this probe is not set Action: restart the system	restart the system
Cine2D_CtrlBlock::vSetState: value of m_GIP_eCineType undefined!!	restart the system
Cine2D_CtrlBlock::vSetState: value of m_pGIP_eR_W_Mode undefined!!	restart the system
CKV_Wrapper: initialization failed	restart the system
Communication thread is dead! Action: Restart the system. Check connection from System to Recorder, Recorder has power and is on.	restart the system; check connection from system to VCR, VCR has power and is on
ConManager - RC_ConstructGOPs: Memory allocation failed	restart the system
Corrupt CVIE parameter file	restart the system
CPI PulseInversion flag for this probe is not set Action: restart the system	restart the system
CPI-mode is only with curved probe Action: Contact technical support	restart the system
CPS_InterfaceToHW::vSet_VOL_MODE -- incorrect value for ColorDMA_Active	restart the system
CPS_InterfaceToHW::vSet_VOL_MODE -- incorrect value for EndOfFrameInt	restart the system
CPS_InterfaceToHW::vSet_VOL_MODE -- incorrect value for LongLineMemFIFO	restart the system
CPS_InterfaceToHW::vSet_VOL_MODE -- incorrect value for Mode_4D	restart the system
CRI: mismatch in steering angle header info Action: restart the system	restart the system
CtrlMvGrpRepresentations::isInWriteMode not supported for mode nr xx	restart the system
CVIE parameter file could not be created	restart the system
D:\\SERVICE\\ConfIndexFile is corrupted Action: restart the system	restart the system

Error Messages	Actions
Data are not saved or sent to DICOM Server!	restart the system
dDistanceFocusReferenceBF_ToProbeSurface out of valid range Action: restart the system	restart the system
Delete error (Backup data could not be deleted.)	check storage destination of Full Backup (e.g., DVD/CD, insufficient rights on target Network drive, write protection on USB-drive)
Density Out Of Range	press ok and save this user-setting once again
Device is not a DVD/CD rec.	reconnect the device
Different software error (Backup data was made on another system with a different software version.)	This backup cannot be restored by the user.
Disc is full!	use a new CDR for writing data to CD
Display:Rect Region fails	restart the system
Do you really want to delete?	
Do you really want to format this DVD?	
done is low!	restart the system
Doppler-Txfrequency out of range	restart the system
Downgrade error (Backup data was made with a software version higher than the installed version.)	load appropriate backup for installed version
DVD Recorder communication error! Check Recorder cables and try again. Make sure DVD Recorder is connected to US machine.	check DVD connections, check if DVD is switched on
DVD Recorder not properly connected or turned off! Check connection from US machine to Recorder, Recorder has power and is on.	check DVD connections, check if DVD is switched on
DVD Recorder timeout error! Check Recorder cables, DVD,... and try again.	check DVD connections, check if DVD is switched on
Electronic user manual not installed. Please install.	install Electronic User Manual (EUM) and try it again
End Bandwidth too big	restart the system
End ET too big	restart the system
End frequency too big	restart the system
Enhance Out Of Range	press ok and save this user-setting once again
Error in apertureShape, lateral start pos of the aperture incorrect! Action: Please contact technical support	restart the system
Error in CreateCineImage	try to store again, restart the system
Error in execution due to: %s, please call technical support.	restart the system
Error in File: ….	restart the system
Error in ProbeTxFocusData. Action: Please contact technical support	Please contact technical support
Error in ProbeTxFocusData. Action: Please contact technical support	Please contact technical support
Error in Select Tx-channel for B-mode	restart the system

Error Messages	Actions
Error in Select Tx-channel for C-mode	restart the system
Error in Select Tx-channel for PW-mode	restart the system
Error no HW present	restart the system
Error not enough time for BC shot! Action: restart the system	restart the system
Error on LoadBootMem Page: xx, Addr: xx	restart the system
Error: xxxx in File xxxxx	
Error: ApertureShapefactor can't be negative! Action: Please contact technical support	Please contact technical support
FallSmooth Out Of Range	press ok and save this user-setting once again
File Could not CRC Check. Action: Load volume files from other storage medium.	load volume files from other storage medium
File CRC Error. Action: Load volume files from other storage medium.	load volume files from other storage medium
File CRC Missing. Action: Load volume files from other storage medium.	load volume files from other storage medium
File Data Missing. Action: Load volume files from other storage medium.	load volume files from other storage medium
File Datalength Not Consistent. Action: Load volume files from other storage medium.	load volume files from other storage medium
File Decompress Error. Action: Load volume files from other storage medium.	load volume files from other storage medium
File Decompress method Unknown. Action: Load volume files from other storage medium.	load volume files from other storage medium
File End Error. Action: Load volume files from other storage medium.	load volume files from other storage medium
File Memory Missing. Action: Load volume files from other storage medium.	load volume files from other storage medium
File Not Found. Action: Load volume files from other storage medium.	load volume files from other storage medium
File Pos. Action: Load volume files from other storage medium.	load volume files from other storage medium
File Read Error. Action: Load volume files from other storage medium.	load volume files from other storage medium
File Type Unknown. Action: Load volume files from other storage medium.	load volume files from other storage medium
File Volume size not consistent. Action: Load volume files from other storage medium.	load volume files from other storage medium
FilterBuffer " Memory allocation failed". Action: please restart the system	restart the system
GeckoBF: Wave Form Table wasn't found! Unknown Wave Form Table Key! Action: Restart the System!	restart the system
GeoDescription3D_TissueCF::operator=: handed over argument is not of same type, dynamic cast failed!!	restart the system
GeoDescriptionMotion Constructor: unknown mode Parameter handed over	restart the system
GeoDescriptionMotion::operator=: handed over argument is not of same type, dynamic cast failed!!	restart the system
GeoDescriptionPWMode::operator=: handed over argument is not of same type, dynamic cast failed!!	restart the system

Error Messages	Actions
GeoDescriptionTissueCF Constructor: unknown mode Parameter handed over	restart the system
GeoDescriptionTissueCF::operator=: handed over argument is not of same type, dynamic cast failed!!	restart the system
hardware error on <var> Action: restart the system	restart the system
HardwareRelatedSoftware_Windows in write have different ProbeAcousticUnitIDs. Action: disconnect all connected probes and connect again, if not ok restart the system	disconnect all connected probes and connect them again; if not ok restart the system
HardwareRelatedSoftware_Windows in write have different ProbeScanFuncIDs. Action: disconnect all connected probes and connect again, if not ok restart the system	disconnect all connected probes and connect them again; if not ok restart the system
IBegrenzer.cpp BCshots no TxPulseEntrys. Action: restart the system, If after restart not ok then call technical support	restart the system
IBegrenzer.cpp Bshots no TxPulseEntrys. Action: restart the system, If after restart not ok then call technical support	restart the system
IBegrenzer.cpp Bshots TxMultiFocus problem	restart the system
IBegrenzer.cpp CWshots no TxPulseEntrys. Action: restart the system, If after restart not ok then call technical support	restart the system
IBegrenzer.cpp MCshots no TxPulseEntrys. Action: restart the system, If after restart not ok then call technical support	restart the system
IBegrenzer.cpp Mshots no TxPulseEntrys. Action: restart the system, If after restart not ok then call technical support	restart the system
IBegrenzer.cpp Mshots TxMultiFocus problem	restart the system
IBegrenzer.cpp PWshots no TxPulseEntrys. Action: restart the system, If after restart not ok then call technical support	restart the system
In the 3D Image Measure is not allowed	change to another format than 3D Fullscreen mode
Incorrect ReplayCtrl-Object	restart the system
incorrect VersionByte, xx of xx cycles OK	contact technical support
iPWCW_CloseProcessing in RT_PWorCWFilterBlock::execute() returned error code xx !! Action: restart the system, If after restart not ok then call technical support	restart the system
iPWCW_InitializeProcessing in RT_PWorCWFilterBlock::execute() returned error code xx !! Action: restart the system, If after restart not ok then call technical support	restart the system
iSetVideoSource(eVideoIntern) function fails Action: The system will restart itself by pressing OK	press OK
LineFilt Out Of Range	press ok and save this user-setting once again
Loading DVD data..... Requested operation could not be executed! Try again after DVD data is loaded.	Press ok, wait until loading process is finished and try again
LP_KoefBlock: SamplePRF too big	restart the system
M_Gain Out Of Range	press ok and save this user-setting once again
M_Reject Out Of Range	press ok and save this user-setting once again

Error Messages	Actions
MC Ensemble Out Of Range	press ok and save this user-setting once again
MC_Balance Out Of Range	press ok and save this user-setting once again
MC_BaseLinePos Out Of Range	press ok and save this user-setting once again
MC_Dynamic Out Of Range	press ok and save this user-setting once again
MC_FallSmooth Out Of Range	press ok and save this user-setting once again
MC_Gain Out Of Range	press ok and save this user-setting once again
MC_RiseSmooth Out Of Range	press ok and save this user-setting once again
MCShotBuffer : not enough memory reserved" ". Action: restart the system	restart the system
M-DynContrast Out Of Range	press ok and save this user-setting once again
memory allocation error Action: restart the system	restart the system
Memory allocation failed Action: restart system	restart the system
MessageBox(NULL, err_msg, "CVIE ERROR", MB_OK);	restart the system
missing BCMCPW_TxFocusData Action: restart the system	restart the system
missing BM_TxFocusData Action: restart the system	restart the system
missing ProbeAcousticUnit, wrong ProbeAcousticUnitID. Action: restart the system	restart the system
missing ProbeGeneral data - wrong ProbeID. Action: restart the system	restart the system
missing ProbeScanFunc - wrong ProbeScanFuncID. Action: restart the system	restart the system
Mode not implemented now	restart the system
MotionColor-DSC 1st:Memory allocation failed	restart the system
MotionColor-DSC 2nd:Memory allocation failed	restart the system
Motion-DSC:Memory allocation failed	restart the system
No Cassette in drive! Put cassette into drive of VCR.	Put cassette into the VCR
No CD Writer found	check the connection and the Power cable - plug the cable off and on and try again. (restart the system)
No default settings available - use "Edit Settings" to set the Default Settings!	select a printer
No disc or device not ready!	insert disk, if fails again reboot and try again (with another disk)
No DVD in drive! Put DVD into drive of Recorder.	Put DVD into drive
no PCI Interface	restart the system
No Printer selected!	select a printer
Not enough space. (Not enough space on destination to hold the backup data.)	select another destination to save Full Backup
overview window creation failed. Action: restart the system	restart the system
Password contains invalid characters. Allowed characters are A..Z, a..z, 0..9 and .	Enter password without invalid characters

Error Messages	Actions
Password is too short. Minimum 6 characters.	Enter password with at least 6 characters
Password must contain at least 2 non-letter characters, 0..9 or	Enter password with minimum 2 non-letter characters
Persistance Out Of Range	press ok and save this user-setting once again
Persistence coeff page index too big	restart the system
pGetActualUnitBuffer failed, RepresentationManager is not initialized	restart the system
Please plug off and on probe and try again	plug of and on the probe and try again, plug it on a different probe connector.
Please plug off and on probe and try again. Plug it on a different probe connector	see error message, connect another probe
pNextUnitCompleted failed, RepresentationManager is not initialized	restart the system
PowerManager: HRS not initialized	restart the system
PowerSpecBuffer memory allocation failed. Action: restart the system	restart the system
PRF_GeneratorBoundary: BBC Ensemble Limitation out of limit. Action: restart the system	restart the system
PRF_GeneratorBoundary: BBCPW Ensemble Limitation out of limit Action: restart the system	restart the system
Probe () doesn't contain correct ProbeVersion! Action: Please contact online center	Please contact technical support
Probe Scan Function Not Supplied	restart the system
Probe with Probe-ID xx not supported. On Attempt to read Probe-ID from an invalid probe connector. Action: restart system	Connect another probe
Probe with Probe-ID xx not supported on left probe connector (A).	Connect another probe
Probe with Probe-ID xx not supported on middle probe connector (B).	Connect another probe
Probe with Probe-ID xx not supported on right probe connector (C).	Connect another probe
Probe-ID valid, but Flexible-EEPROM-Datamodel not implemeted yet. On Attempt to read Probe-ID from an invalid probe connector. Action: restart system	restart the system
Probe-ID valid, but Flexible-EEPROM-Datamodel not implemeted yet on left probe connector (A).	
Probe-ID valid, but Flexible-EEPROM-Datamodel not implemeted yet on middle probe connector (B).	
Probe-ID valid, but Flexible-EEPROM-Datamodel not implemeted yet on right probe connector (C).	
PW Archive::not implemented Action: restart the system	
PW_BaseLinePos Out Of Range	press ok and save this user-setting once again
PW_BurstCalcBlock: UserProgApplication out of range. Action: restart system	restart the system
PW_CW_FFT_FactBlock: DSC_ScrollX_Zoom darf nicht kleiner als eins sein!	restart the system
PW_Dynamic Out Of Range	press ok and save this user-setting once again
PW_Reject Out Of Range	press ok and save this user-setting once again

Error Messages	Actions
PWCW-DSC:Memory allocation failed	restart the system
PWGain Out Of Range	press ok and save this user-setting once again
PWM-Acoustic value not defined. Action: Please call technical support	Please call technical support
RawDataSynthesizer : memory allocation failed	restart the system
Regional settings for Numbers/Decimal symbol has been changed back to '.'	No action required (for information only)
ReplayCtrlAcquisition::vReconnect failed, selected movie group unknown. Action: restart the system, If after restart not ok then call technical support	restart the system
ReplayCtrlAcquisition::vRunAcquisition failed, selected movie group unknown. Action: restart the system, If after restart not ok then call technical support	restart the system
ReplayCtrlAcquisition::vSetForAllRepMngrsParams failed, selected movie group unknown. Action: restart the system, If after restart not ok then call technical support	restart the system
ReplayCtrlArchive : incomplete implementation for "REPLAY_CTRL_ARCHIVE"	restart the system
RepresentationManager returned NULL write position. Action: restart the system, If after restart not ok then call technical support	restart the system
RepresentationManager: NextChunkGenerated failed, number bytes written!=UnitSize	restart the system
RepresentationManager::addListener called within Transaction!!	restart the system
RepresentationManager::Destructor caused exception, Open Transaction!!	restart the system
RepresentationManager::pActualUnitWrtAddr called within Transaction!!	restart the system
RepresentationManager::pNextUnitsCompleted called within Transaction!!	restart the system
RepresentationManager::removeAllListener called within Transaction!!	restart the system
RepresentationManager::removeListener called within Transaction!!	restart the system
RepresentationManager::vClear called within Transaction!!	restart the system
RepresentationManager::vCreate: Dimension unknown, arguments of vSetReplayParams() incorrect!!	restart the system
RepresentationManager::vCreate: Nr of Units = xx, wrong arguments in Constructor and/or vSetReplayParams() used!! Parameters => Mode[xx] BufferSize[xx] unitSize[xx] m_iSizeDim0[xx] m_iNrDim0[xx] m_iNrDim1[xx] m_iNrDim2[xx]	restart the system
RepresentationManager::vCreate: Nr. Dim 0 incorrect, see vSetReplayParams() call	restart the system
RepresentationManager::vCreate: Nr. Dim 1 incorrect, see vSetReplayParams() call	restart the system
RepresentationManager::vCreate: Nr. Dim 2 incorrect, see vSetReplayParams() call	restart the system
RepresentationManager::vCreate: Size Dim 0 incorrect, see vSetReplayParams() call. Action: restart the system, If after restart not ok then call technical support	restart the system
RepresentationManager::vResizeBufferLength called within Transaction!!	restart the system
RepresentationManager::vResizeBufferLength caused exception, replay buffer is not empty!!	restart the system

Error Messages	Actions
RepresentationManager::vSetGeoDescription called within Transaction!!	restart the system
RepresentationManager::vSetReplayParams called within Transaction!!	restart the system
Restore error (Error while reading backup data.)	Backup data are probably damaged. Try again or load another backup.
RiseSmooth Out Of Range	press ok and save this user-setting once again
RT_4DTissueFilterBlock:: Storage Error, no dynamic memory for filter operations available!!	restart the system
RT_4DTissueFilterBlock:: storage needed for one filtered volume differs from available Unitsize within replay buffer!!	restart the system
RT_4DTissueFilterBlock::bDllLineFilter call failed!!	restart the system
RT_4DTissueFilterBlock::bDllLineFrameFilter call failed!!	restart the system
RT_4DTissueFilterBlock::DMA Block size and calculated frame size differs!!	restart the system
RT_4DTissueFilterBlock::execute replay buffer write address is NULL!! Action: restart the system, If after restart not ok then call technical support	restart the system
RT_4DTissueFilterBlock::vCheckCahngedInports Replay buffer not cleared before VolGeoChange!!	restart the system
RT_ColorFlowFilterBlock Constructor: Memory allocation failed	restart the system
RT_ColorFlowFilterBlock::vCheckIQDataSizeAndUpdateTables: Memory allocation failed. Action: restart the system, If after restart not ok then call technical support	restart the system
RT_ColorFlowFilterBlock::vDebugDrawIQDataCurve: Memory allocation failed. Action: restart the system, If after restart not ok then call technical support	restart the system
RT_ConnectionMngr::vAssembleRTSet: no RT_TissueFilterBlock found for TISSUE3D Blocks	restart the system
RT_ECG_Block::bStart ECGInterface failed!!	restart the system
RT_MColorFilterBlock::Memory allocation failed. Action: restart the system, If after restart not ok then call technical support	restart the system
RT_MColorFilterBlock::vCheckIQDataSizeAndUpdateBuffer: Memory allocation failed	restart the system
RT_MColorFilterBlock::vDebugDrawIQDataCurve: Memory allocation failed	restart the system
RT_MotionMBlock::execute caused exception:: Addr from DMA= xx, ReplayBuffAddr= xx, (Line+Header)Size= xx, blockLength= xx, value i= xx!! Action: restart the system, If after restart not ok then call technical support	restart the system
RT_MotionMCTestBlock::execute: Error, length of DMA block 1[xx] is not aligned to line size!!	restart the system
RT_MotionMCTestBlock::execute: Error, length of DMA block 2[xx] is not aligned to line size!!	restart the system
RT_PWorCW_Block::replay buffer size smaller than expected	restart the system
RT_PWorCW_Block::execute caused exception:: Addr from DMA=xx, ReplayBuffAddr=xx, (Line+Header)Size=xx, blockLength=xx, line index=xx!!	restart the system

Error Messages	Actions
RT_PWorCW_Block::execute: Error, length of DMA block 1[xx] is not aligned to line size!! Action: restart the system, If after restart not ok then call technical support	restart the system
RT_PWorCWFilterBlock::execute : replay buffer size smaller than expected. Action: restart the system, If after restart not ok then call technical support	restart the system
RT_PWorCWFilterBlock::execute caused exception:: Addr from DMA=xx, ReplayBuffAddr=xx, (Line+Header)Size=xx, blockLength=xx, line index=xx!! Action: restart the system, If after restart not ok then call technical support	restart the system
RT_PWorCWFilterBlock::execute: Error, length of DMA block 1[xx] is not aligned to line size [xx]!! Action: restart the system, If after restart not ok then call technical support	restart the system
RT_PWorCWFilterBlock::execute::first sequence description of sequence description vector is accepted to be PW shot sequence!!	restart the system
RT_PWorCWFilterBlock::RT_PWorCWFilterBlock():: iPWCW_InitializeProcessing returned error code xx!! Action: restart the system, If after restart not ok then call technical support\	restart the system
RT_RFProcessBlock Constructor: Memory allocation failed. Action: restart the system, If after restart not ok then call technical support	restart the system
RT_RFProcessingBlock::pGetAdjustedInputBuffer: Memory allocation failed. Action: restart the system, If after restart not ok then call technical support	restart the system
RT_RFProcessingBlock::vDisplayRFSpectrum: Memory allocation failed. Action: restart the system, If after restart not ok then call technical support	restart the system
RT_RFProcessingBlockColor::vCheckIQDataSizeAndUpdateTables: Memory allocation failed. Action: restart the system, If after restart not ok then call technical support	restart the system
RT_RFProcessingBlockColor::vCheckRFDataSizeAndUpdateBuffers: Memory allocation failed. Action: restart the system, If after restart not ok then call technical support	restart the system
RT_RFProcessingBlockTissue::vCheckRFDataSizeAndUpdateBuffers: Memory allocation failed. Action: restart the system, If after restart not ok then call technical support	restart the system
RT3D.cpp rot phased: unexpected O_AxisAngle ?	restart the system
RT-TissueFilter DLL call failed. Action: restart system	restart the system
SamplePRF too big. Action: restart system	restart the system
see <InfoValid> with disconnected ECG, xx of xx cycles OK	(Test output, no error message)
Setting Timer failed!	restart the system
SlowMotion 3D in Color must have decimation of value 1	restart the system
SRI: filter creation failed	restart the system
Start Bandwidth too small	restart the system
Start ET too small	restart the system
Start frequency too small	restart the system
Still DICOM images available!	DICOM images available

Error Messages	Actions
Stop device failed. It is probably still in use, please try to stop it later.	check if there is still a file open from the volume and retry
StoragePool: Not sufficient replay storage for B & CF Mode available	restart the system
StoragePool: Not sufficient replay storage for ECG available	restart the system
StoragePool: Not sufficient replay storage for M Mode available	restart the system
StoragePool: Not sufficient replay storage for MC or PW Mode available	restart the system
System must be restarted. Reason: Corrupt Factory Settings	restart the system
System must be restarted.\nReason: Corrupt Factory Settings. Choose ""Ok"" to use Safety-Copy after Restart. Choose ""Cancel"" and load Factory Settings from Backup after restart.	restart the system
The "Current Password" does not match the actual password.	enter correct password
The "New Password" does not match with "Retype new password".	retype both passwords
The Database UserPrograms Corrupted. Action: Restart the system	restart the system
The Date format not stored properly. Action: close registry, restart, try again	close registry, restart the system and try again
The device can now be safely removed from the system.	press ok and remove the USB volume
The entered password does not match the actual password.	enter correct password
The Handle Unregistered. Action: close registry, restart, try again	close registry, restart the system and try again
The Registry not closed. Action: close registry, restart, try again	restart the system
The System detected a problem with your harddisk. Please do not reboot or shut down the machine! Please contact your service department as soon as possible.	if possible, • save “Full Backup” (see: Section 4-5-3 on page 4-42) to “DVD/CD”, “Network”, or “Other drive” (including images) • if not currently done, save “Image Archive” (see: Section 4-5-6-1 on page 4-47), • call technical support
There is no Printer selected!	select a printer
Thickness mismatch xx - GIP xx. Action: restart 3D (go to 2D), restart the system	restart 3D (go to 2D); restart the system
throw HRS_Exception(err_msg);	restart the system
throw HRS_Exception(error.ErrorMessage());	restart the system
throw HRS_Exception(error.what());	restart the system
throw HRS_Exception(str);	restart the system
Tx-Power to HW : Unkown Systemtype. Action: restart the system, If after restart not ok then call technical support	restart the system
UI_BBC_ArchiveWnd : incomplete implementation for....	restart the system
UI_BBC_ArchiveWnd::vSet() has an wrong ImageType. Action: restart the system	restart the system
UI_BBC_ArchiveWnd::vSet() will change from eB_Wnd to wrong ImageType. Action: restart the system	restart the system

Error Messages	Actions
UI_BBC_ArchiveWnd::vSet() will change from eBBC_Wnd to wrong ImageType. Action: restart the system	restart the system
UI_BBC_Wnd::vSet() has an wrong ImageType. Action: restart the system	restart the system
UI_BBC_Wnd::vSet() will change from eB_Wnd to wrong ImageType Action: restart the system	restart the system
UI_BBC_Wnd::vSet() will change from eBBC_Wnd to wrong ImageType. Action: restart the system	restart the system
UI_Manager: failed to create BBC Wnd. Action: restart the system	restart the system
UI_Manager::vDestroyWnd: dynamic cast to UI_MMC_Wnd* failed	restart the system
UI_Manager::vDestroyWnd: dynamic cast to UI_PW_Wnd* failed	restart the system
UI_Manager::vHRS_Execute multiple call	restart the system
Unable to complete export the TA!	restart the system
Unable to complete export the TA!Unable to create new HDF5 file for TA!	check free disk space
Unexpected exception occurred!!	restart the system
Unhandled Probe-EEPROM data type on Attempt to read Probe-ID from an invalid probe connector. Action: restart system	Connect another probe
Unhandled Probe-EEPROM data type on left probe connector (A).	Connect another probe
Unhandled Probe-EEPROM data type on middle probe connector (B).	Connect another probe
Unhandled Probe-EEPROM data type on right probe connector (C).	Connect another probe
Unhandled Probe-EEPROM data type on upper-left probe connector (CW).	Connect another probe
Unit ID calculated in bGetUnitByStamp out of range	restart the system
Unknown Error	check VCR connections and if its switched on
Unknown Error Action: Load volume files from other storage medium.	load volume files from other storage medium
Unknown system exception	restart the system
unknown Xilinx-Version	restart the system
unrecordable disc or disc is closed	try again with another disk
Verify error (Error while checking backup data.)	Backup data are probably damaged. Try again or load another backup.
Volume_dB Out Of Range	press ok and save this user-setting once again
ViewerConMngr::vAssembleCF_DFE:attempt to get ECG_Consumer_2D- or ECG_Draw_2D-Block from ECGViewer Objects failed!!	restart the system
ViewerConMngr::vAssembleCF_DFE:attempt to get ECG_CalcHR-Block from ECGViewer Objects failed!!	restart the system(If after restart not ok then cal technical support)
WMF_KoefBlock: SamplePRF too big	restart the system
Write error! Action: use a new CDR, call technical support	use a new CDR

Error Messages	Actions
Write Protected cassette! Remove cassette from VCR and put writeable cassette into drive of VCR.	Remove cassette from VCR and put writeable cassette into drive of VCR
Write Protected DVD! Remove DVD and put writeable DVD into drive of Recorder.	Put writeable DVD into Drive
Wrong disc type! Please enter a data disc and try again.	enter data disc and try again
Wrong key!	restart the system
XTD - pucBackScaledBImage: Memory allocation failed	restart the system
XTD - pucDSCBImage: Memory allocation failed	restart the system
XTDTrackballCtrlState::No frame to trackball position found, internal failure!!	restart the system

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Chapter 8
Replacement Procedures

Section 8-1
Overview

8-1-1 Purpose of Chapter 8

This chapter contains replacement procedures for different modules and their subsystems.

NOTICE The **Manpower**, time and **Tools** indicated in the Sub-sections include all requirements from **Preparations** to **Installation Procedures**.

WARNING ***No covers or panels should be removed from the system (high-voltage risk). Service and repairs must only be performed by authorized personal. Attempting do-it-yourself repairs invalidate warranty and are an infringement to regulations and are inadmissible acc. to IEC 60601-1. Under the condition of regular maintenance by authorized service personnel a lifetime of 7 years for the equipment and 5 years for the probes may be expected.***

The Waste of Electrical and Electronic Equipment (WEEE) must not be disposed as unsorted municipal waste and must be collected separately.
Please contact the manufacturer or other authorized disposal company for information concerning the decommission of your equipment.

Table 8-1 Chapter 8 Contents

8-1-2 Returning/Shipping System, Probes and Repair Parts

When returning or shipping the Voluson® S8 / Voluson® S6 system in the original packaging:

- system must be lowered to its minimum height with monitor flapped down (see: Figure on page 3-12)
- the Control Console has to be centered and locked in “unextended” position

NOTE: For Control Console Positioning refer to 5-11-3 on page 5-45..

Equipment being returned must be clean and free of blood and other infectious substances.

GEHC policy states that body fluids must be properly removed from any part or equipment prior to shipment. GEHC employees, as well as customers, are responsible for ensuring that parts/equipment have been properly decontaminated prior to shipment. Under no circumstance should a part or equipment with visible body fluids be taken or shipped from a clinic or site (for example, body coils or and ultrasound probe).

The purpose of the regulation is to protect employees in the transportation industry, as well as the people who will receive or open this package.

The US Department of Transportation (DOT) has ruled that “items what were saturated and/or dripping with human blood that are now caked with dried blood; or which were used or intended for use in patient care” are “regulated medical waste” for transportation purpose and must be transported as a hazardous material.

Section 8-2
System Software - Installation/Upgrade Procedure

8-2-1 Introduction

NOTICE To update the Systems C:\ image via the FMI FROM DVD button in the System Setup **SERVICE** page, see: Section 8-2-5 "System Software - Installation Procedure (FMI from DVD)" on page 8-7.
The Software parts to be upgraded (e.g., Ultrasound Application Software, Service Software, EUM, MS Patches, etc.) depend on the contents of the System DVD being used.

NOTICE If the currently installed software has to be upgraded to a newer version, and the system DVD being used is **SW 11.0.0 or higher**, a new software specific “Permanent key is required. Please contact your local distributor or GE service representative.

8-2-2 Manpower

One person ~ 1 hour (depends on contents of System DVD, peripherals, etc.)

8-2-3 Tools

System DVD

8-2-4 Preparations

Before performing the Software Upgrade:

- make sure that all system functions are working correct
- check the current Application Software version (Figure 8-2) and the installed Options (Figure 8-2)
- if the currently installed software has to be upgraded by a newer version, and the system DVD being used is **SW 11.0.0 or higher**, calculate new software specific “Permanent key” in OKOS. Please contact your local distributor or GE service representative to get the necessary key.

*NOTE: It is **NOT necessary** to save Full System Configuration (Full Backup) prior to the upgrade. All existing User Programs, 3D/4D Programs and Auto Text settings remain untouched!*

8-2-4 Preparations (cont'd)

Table 8-2 System Function

Mode	Task	Expected Result
2D Mode Quality	Connect an abdominal probe, press the PROBE key, select the "Abdomen" - Application and start the "Default" -Program. Record a 2D image of the Liver. If there is no abdominal probe, record a 2D image the Thyroid using a small parts probeand corresponding program.	regular and homogenous 2D image
Receiver Frequency	Use the FREQUENCY control to switch the Receiver Frequency range (penet./norm/resol.).	no disturbances in the 2D image during changing the Receiver Frequency
M Mode	Start the "Abdomen" -Program, adjust the M Cursor (vessel) and activate the M Mode. Adjust the SPEED key to change the M Mode sweep speed. After FREEZE, move the TRACKBALL to recall the stored sequence.	the M Cursor agree with Vessel Cine loop is displayed
Volume Mode	Start the Volume acquisition using a Real Time 4D probe.	continuous Volume Acquisition (without any "jumps") and smooth echo shape with clear defined image edge
Triplex Mode	Start the "Abdomen" -Program and switch on the CFM- and the PW Mode. Adjust the Doppler Cursor and press the right trackball key to activate the Triplex-Mode.	no disturbances in the 2D/Color and the Doppler image

1.) Press the **UTILITIES** key on the control panel.
2.) In the "Utilities" menu select SYSTEM SETUP to invoke the setup desktop on the screen.
3.) On the left side of the screen select ADMINISTRATION and then click the **SYSTEM INFO** tab, to see

which Software/Hardware version is installed in the unit.

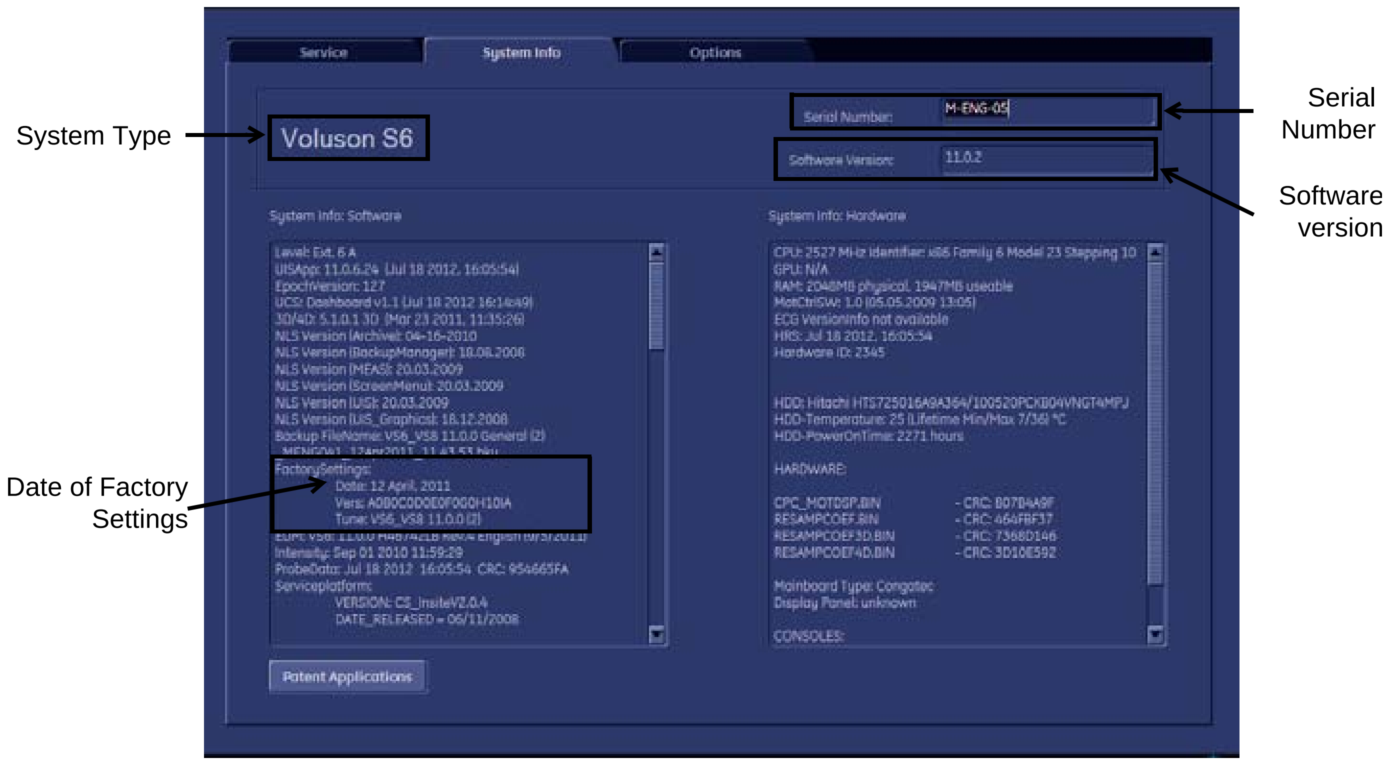


Figure 8-1 Version check (System Setup - Administration - SYSTEM INFO page)

8-2-4 Preparations (cont'd)

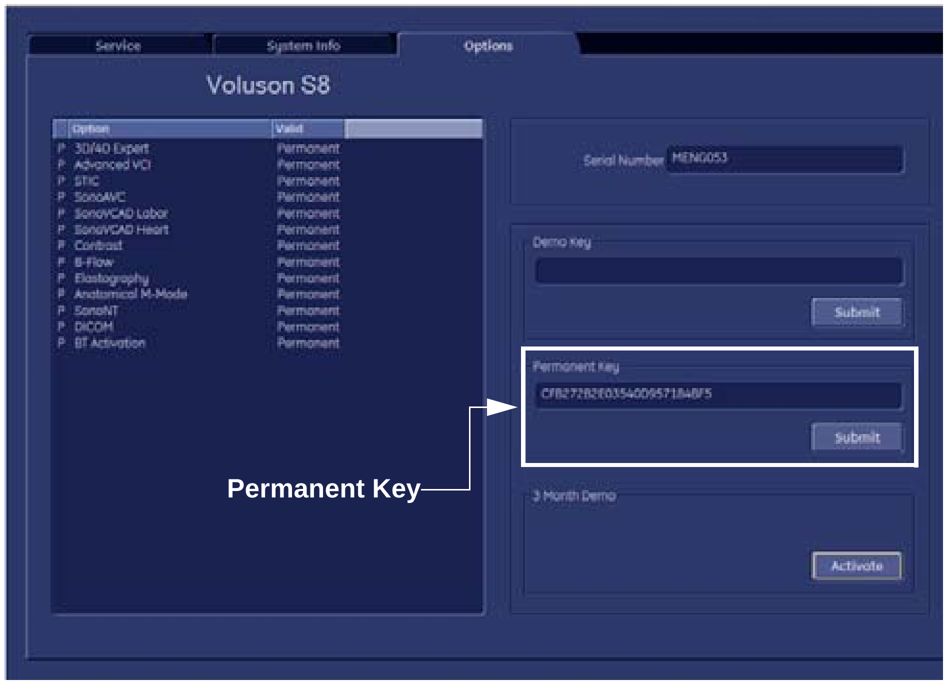
4.) Select the OPTIONS tab to see which Options (and Application Packages) are installed.

Voluson S8

D = Demo
(Option is activated for demo and expires on the date shown in the "Valid" column)

I = Inactive
(Option is not activated)

P = Permanent
(Option is permanently activated [purchased])



Voluson S6

D = Demo
(Option is activated for demo and expires on the date shown in the "Valid" column)

I = Inactive
(Option is not activated)

P = Permanent
(Option is permanently activated [purchased])

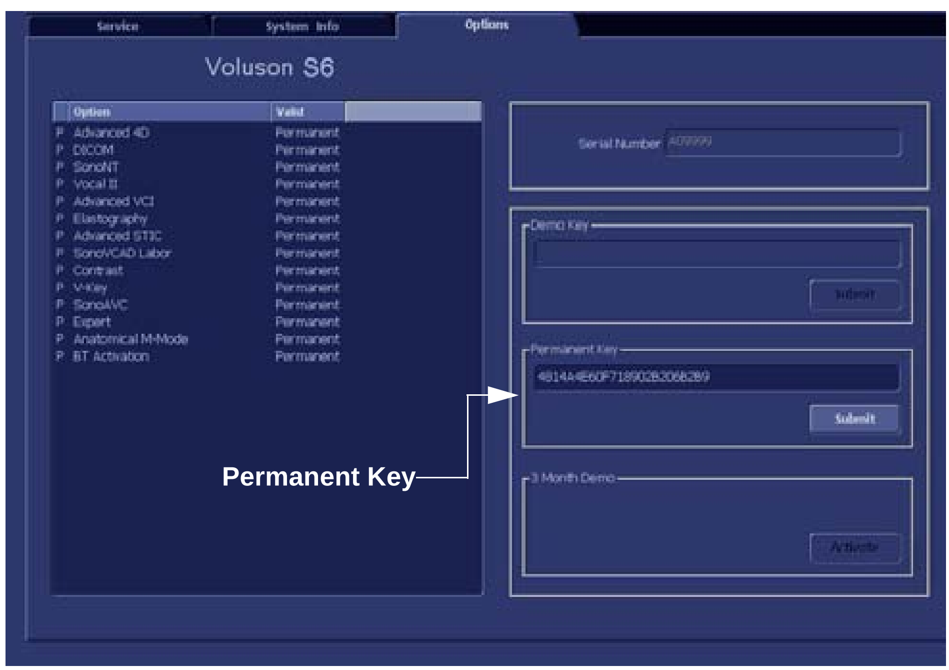


Figure 8-2 System Setup - Administration - OPTIONS page

NOTICE Please print out the OPTIONS page or write down the "Permanent Key".

If the currently installed software has to be upgraded to a newer version, and the system DVD being used is **SW 11.0.0 or higher**, a new software specific "Permanent key is required.
Please contact your local distributor or GE service representative.

8-2-5 System Software - Installation Procedure (FMI from DVD)

The system software installation procedure starts with saving and recording the settings present on the system (silent “Rollback”). Then the new software is written to the hard disk using the System DVD. Application Settings are automatically updated, to match with new Software version.

Existing User Programs, 3D/4D Programs and Auto Text remain unaffected! Afterwards the new software is configured such that it is integrated again in its environment.

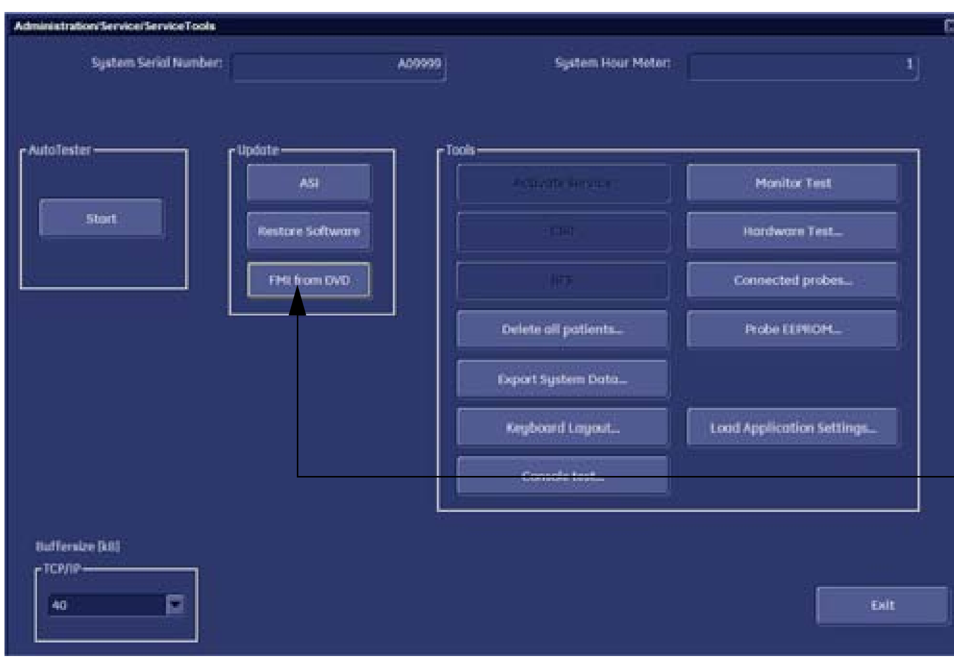
CAUTION **Disconnecting ALL external USB devices** (**except DVD/CD+R/RW drive) is NECESSARY.**
Re-installation of any previously attached printer has to be done after the upgrade procedure.
Note: Installing the Bluetooth Printer and its connection set is not possible by the user.

NOTE: For more detailed information about “FMI from DVD” refer to 5-14-3-2-1 on page 5-56.

1.) Perform Preparations as described in 8-2-4 on page 8-3.
2.) If not already done, disconnect all external USB devices (**except** DVD/CD+R/RW drive).
3.) Insert the System DVD into the drive.
4.) **Restart** the system. (Turn system OFF and then back ON.)

NOTICE If the system boots into LINUX, the “Boot priority order” in BIOS is **incorrect**.
In this case, cancel the software installation procedure (select Exit/Reboot by means of the [Arrow] keys (right, left, up, down) and the [Enter] key on the keyboard) and then contact your service representative.

5.) After system restart, press the **UTILITIES** key on the control panel.
6.) In the “Utilities” menu select SYSTEM SETUP to invoke the setup desktop on the screen.
7.) On the left side of the screen select ADMINISTRATION and then click the **SERVICE** tab.
8.) Type in the password SHE and click ACCEPT.



[FMI from DVD] button

Figure 8-3 Service Tools

8-2-5 System Software - Installation Procedure (FMI from DVD) (cont'd)

9.) Click the FMI FROM DVD button (see: Figure 8-3 on page 8-7) for updating the System Software.

10.) Verify that only the DVD drive is connected to the system, then click OK (Figure 8-4 below).

Figure 8-4 Verify that USB devices are disconnected, then click OK

11.) To start update procedure click YES (Figure 8-5 below).

Figure 8-5 Yes - start update procedure

The system saves Full Backup in silent mode on R:, then it reboots into LINUX.
A silent "Rollback" image from C:\ is stored on R:\.
After executing all LINUX commands, the system reboots again.

*NOTE: If the currently installed software has to be upgraded to a newer version, and the system DVD being used is **SW 11.0.0 or higher**, a new software specific "Permanent key is required.*

- Enter the appropriate "Permanent Key" (calculated in OKOS), select OK and confirm with **ENTER**.

***Note:** This Example shows fictional numbers.*

Figure 8-6 insert Permanent Key

- If the entered Permanent key is correct, following window appears, confirm with **ENTER**.

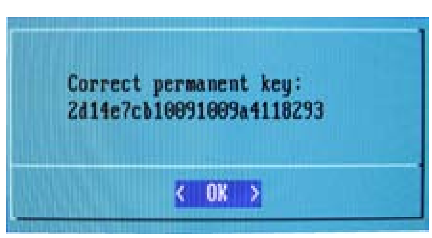


Figure 8-7 confirm Permanent Key

8-2-5 System Software - Installation Procedure (FMI from DVD) (cont'd)

12.) Check disk is performed automatically - restart.

NOTICE Do NOT skip checkdisk.

Figure 8-8 Check disk is performed automatically

13.) 3 dots (one after the other) appear on the screen (see: Figure 8-9 below).

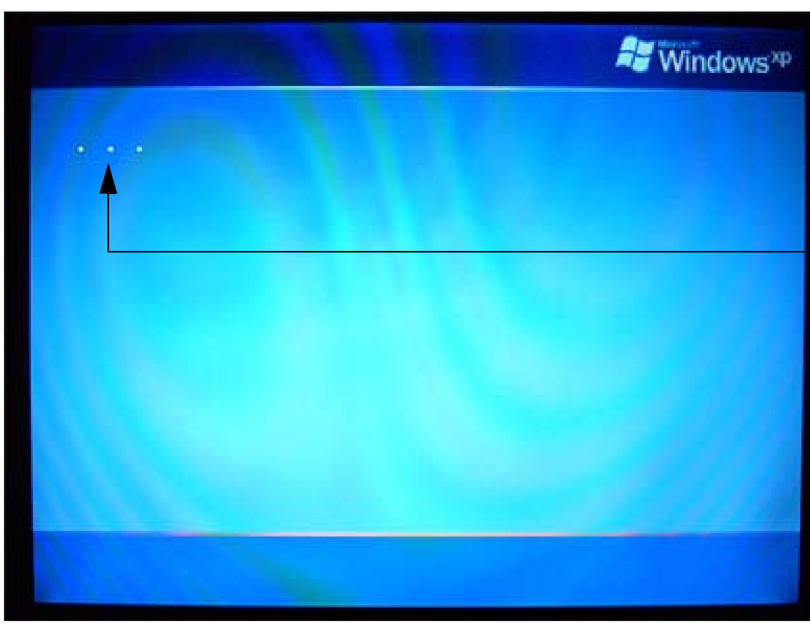


Figure 8-9 3 dots appear on the screen

8-2-5 System Software - Installation Procedure (FMI from DVD) (cont'd)

14.) Booting **auto**.....

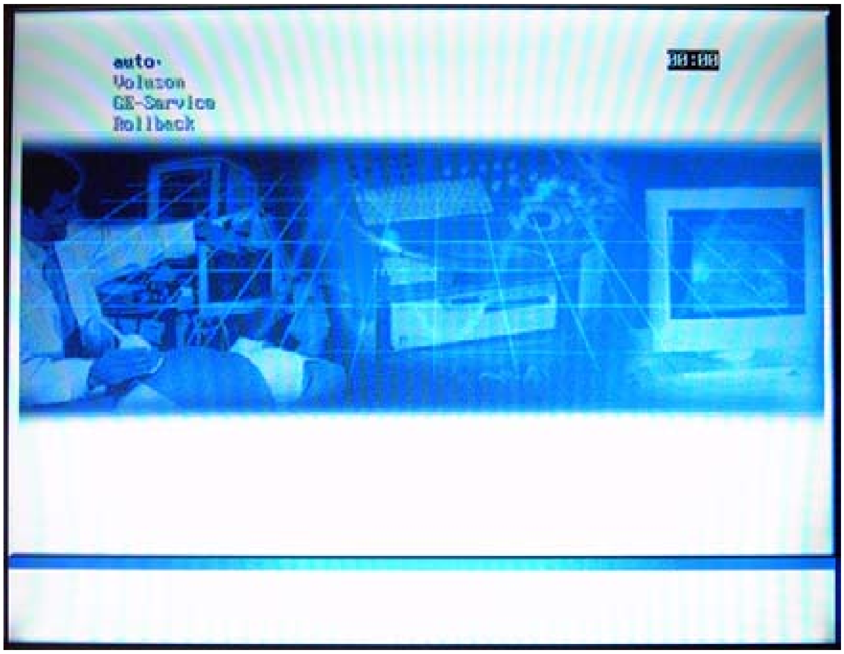


Figure 8-10 Boot screen - auto

15.) Updating will take some time......

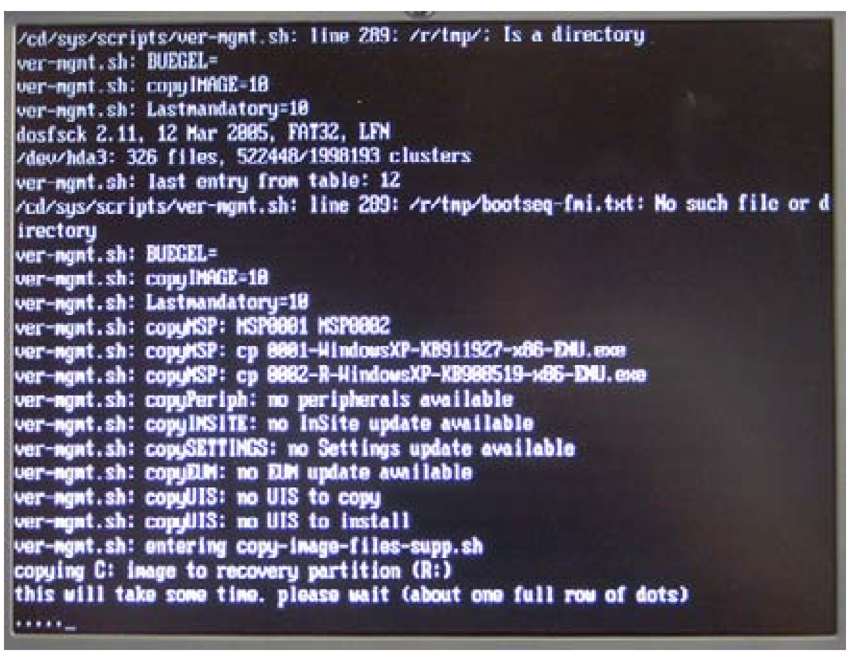


Figure 8-11 Please wait....

16.) Please wait until all processes are finished (100 percent completed).

17.) The system is rebooting into windows (Boot screen - **Voluson**).

8-2-5 System Software - Installation Procedure (FMI from DVD) (cont'd)

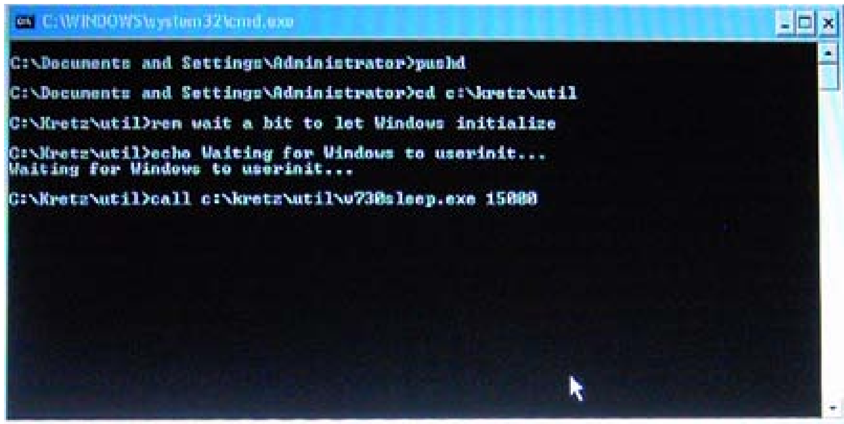


Figure 8-12 automatic processes are running

18.) Please wait until all processes are finished. Finally the 2D screen is displayed on the monitor.

NOTE: If the BT warning dialog (Figure 8-13 below) appears, enter the proper "Permanent key" and then click SUBMIT.

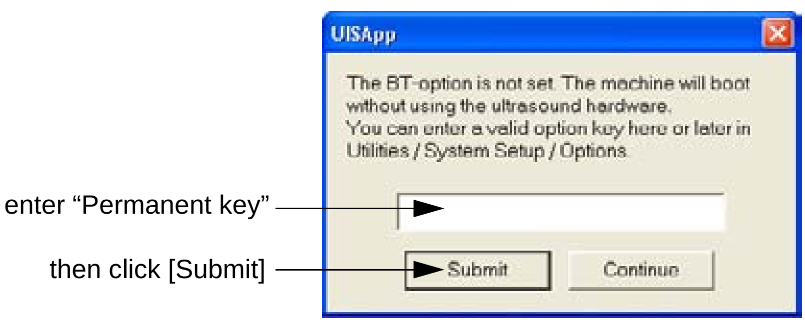


Figure 8-13 Enter Permanent key

19.) Remove the System DVD from the DVD/CD+R/RW Drive drive.

20.) If Control Panel is not working after first boot up, please **shut down** the system; then boot up again.

⚠ **NOTICE** After turning off a system, wait at least 10 seconds before turning it on again.
The system may not be able to boot if power is recycled too quickly.

21.) **Reconnect the external devices**, install all the printers and adjust the printer settings as described in Section 3-7 "Printer Installation" on page 3-31.

22.) Check and match Printer Remote Control selection in the System Setup - Connectivity - BUTTON CONFIGURATION page.

23.) Confirm that the date and time are set correctly and that the Windows automatic DST feature is ON.

24.) Perform Software and Functional checks as described in Section 8-3 on page 8-12.

Section 8-3
Software and Functional Checks after Installation/Upgrade Procedure

1.) Press the **UTILITIES** key on the control panel.
2.) In the “Utilities” menu select SYSTEM SETUP to invoke the setup desktop on the screen.
3.) On the left side of the screen select ADMINISTRATION and then click the **OPTION** tab.
4.) Verify the correct settings of the OPTIONS page; see: Figure 8-2 on page 8-6.
If necessary, customize the settings according to the printout.
5.) Click the **SYSTEM INFO** tab.

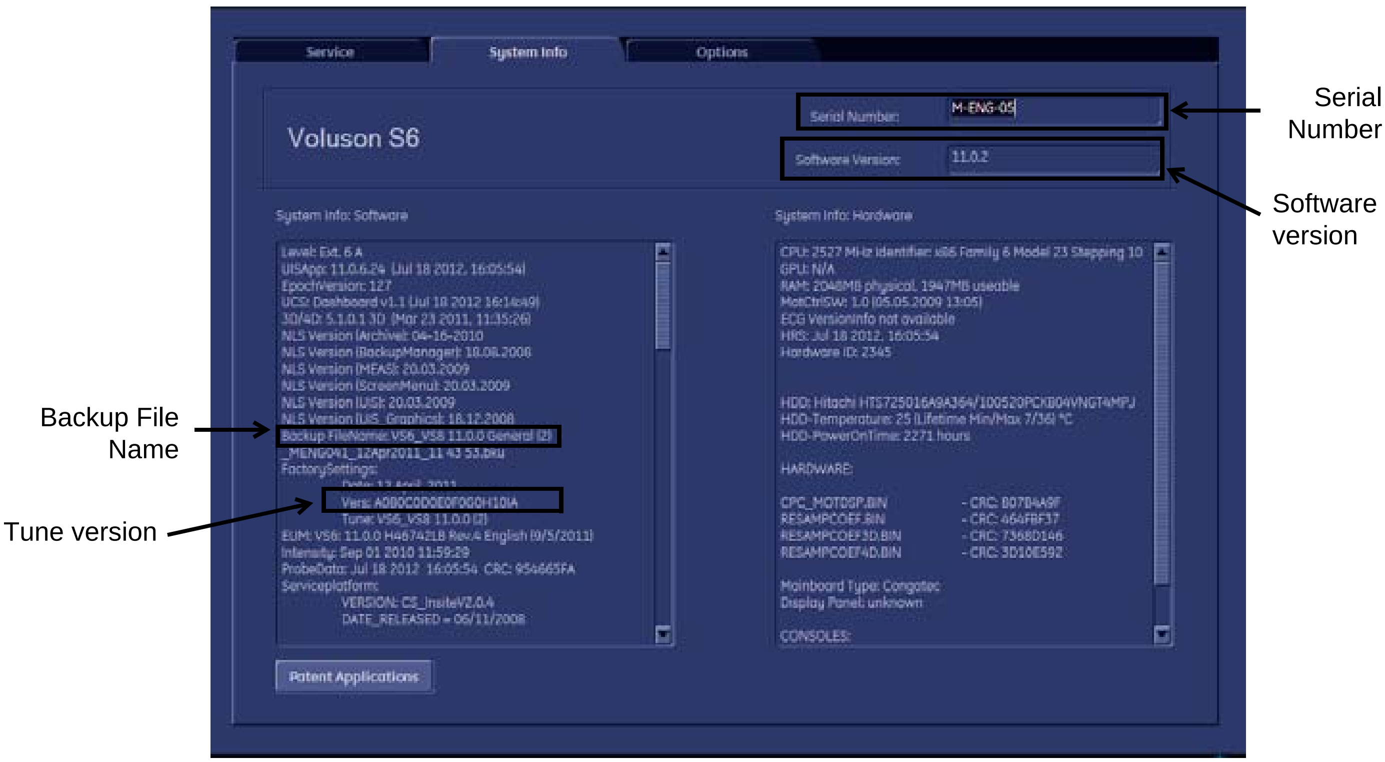


Figure 8-14 System Setup - Administration - SYSTEM INFO page

6.) Check the Application Software version.
7.) Check that the Tune version of the Application presets match the Application Software version.

NOTICE It is **neither required nor advisable to reload a previously stored “Full Backup”** after a software upgrade that was performed by means of the FMI FROM DVD button!

If the Tune version does not match the Application Software version, a warning message appears whenever booting up the system.
In this case, it is essential to load the **proper Application Settings** (image presets), adapted for the installed software version. Refer to: Section 5-14-3-10 "Load Application Settings" on page 5-57.

8.) Connect at least one probe and then click the button at the bottom of the SYSTEM INFO page to start Hardware configuration detection (see: Figure 8-14 above).
9.) Perform basic functional checks to ensure system is functioning normally.

Section 8-4
Image Settings Only - Loading Procedure

8-4-1 Introduction

The Image Settings contain:

- Application Settings
- User Programs
- Auto Text
- 3D/4D Programs
- Scan Assistant
- Measure configuration

8-4-2 Loading Procedure

see: Section 4-5-2 "Load Image Settings Only" on page 4-39

Section 8-5
Full Backup (Full System Configuration) - Loading Procedure

8-5-1 Introduction

The Full Backup contains following data:

- User Settings (databases and files containing User Programs, 2D/3D/4D Programs, Auto Text entries, gray curves and complete System settings such as language, time/date format, etc.)
- Measure Configuration (user specific measure setup settings)
- Patient Archive (database containing patient demographic data and measurements) - **no images**
- Options (Permanent Key that is specific for enabled software options and Demo Key)
- Image Transfer Configuration (DICOM settings e.g., DICOM servers, AE Title, Station Name, etc.)
- Network Configuration (network settings including the computer name)
- Service Platform (state of the Service Software)

8-5-2 Loading Procedure

see: Section 4-5-4 "Load Full System Configuration (Full Backup)" on page 4-44

Section 8-6
Image Archive - Loading Procedure

8-6-1 Introduction

A backup of the Image Archive contains the Patient Archive (database containing patient demographic data and measurements) **+ images**.

8-6-2 Loading Procedure

see: Section 4-5-6-2 "Load Image Archive" on page 4-49

Section 8-7
Replacement or Activation of Options

Following SW Options are available:

Options	VS6	VS8
3D/4D Expert	N/A	Option
4D Basic	Option	N/A
3D/4D Advanced	Option	N/A
Anatomical M-mode	Option	Option
B-Flow	Option	Option
4D Realtime	Option a)	Option c)
Realtime 4D Biopsy	N/A	Option c)
3D	Option b)	Option c)
3D CFM - Power	Option b)	Option c)
STIC	Option	Option
Vocal II	N/A	Option
VCI (VCI A and VCI-Omniview)	Option	Option
Interface for DICOM 3	Option	Option
4DView PC Software	Option	Option
Inversion mode	N/A	Option c)
Translation Cine	N/A	Option c)
Rotation Cine	Option b)	Option c)
Slice Cine	N/A	Option c)
3D/4D	Option b)	Option c)
TUI	std	Option c)
SonoRenderStart	Option b)	Option c)
SonoAVC follicle	Option	Option
SonoVCAD heart	N/A	Option
SonoVCAD labor	Option	Option
Coded Contrast Imaging	N/A	Option
Elastography	Option	Option

NOTE: *Option a) : standard if 4D Basic option is enabled or 3D/4D Advanced is enabled*

Option b) : standard if 3D/4D Advanced is enabled*

Option c): standard if 3D/4D Expert is enabled .

8-7-1 Operation for activating Options

1.) Press the **UTILITIES** key on the control panel.
2.) In the “Utilities” menu select SYSTEM SETUP to invoke the setup desktop on the screen.
3.) On the left side of the screen select ADMINISTRATION and then click the **OPTIONS** tab (see: Figure 8-2 on page 8-6.)

8-7-1-1 Operation for installing a “Demo Key” or a “Permanent Key”:

1.) Position the cursor inside the input field desired and press the **right/left trackball** key.
2.) If one exists, clear/edit the current key code.
3.) Enter the encrypted serial code with the keyboard and click on SUBMIT. (Code will be checked.)
4.) Click the SAVE&EXIT button.

NOTE: After activating a key code, restart (turn off and on) the Voluson® S8 / Voluson® S6 system.

Section 8-8
Replacement of the Caster Cap

8-8-1 Manpower

One person, 2 minutes

8-8-2 Tools

None

8-8-3 Preparations

1.) Power Off/Shutdown the system as described in 4-3-2 on page 4-4.

8-8-4 Removal Procedure

1.) Remove the CASTER CAP by unhooking the 2 hooks below. Refer to the figure below.

Figure 8-15 Removeing the CASTER CAP

8-8-5 Installation Procedure

1.) Install the new parts in the reverse order of removal.

Section 8-9
Replacement of the CASTER

8-9-1 Manpower

One person, 10 minutes

8-9-2 Tools

Monkey Wrench

8-9-3 Preparations

1.) Power Off/Shutdown the system as described in 4-3-2 on page 4-4.

8-9-4 Removal Procedure

1.) Remove the CASTER CAP by unhooking the 2 hooks below. Refer to the figure below.

Figure 8-16 Removeing the CASTER CAP

2.) Unfasten the NUT. And pull out the CASTER. Refer to the figure below.

Figure 8-17 Unfasten the NUT

8-9-5 Installation Procedure

1.) Install the new parts in the reverse order of removal.

Section 8-10
Replacement of the Footrest Cover

8-10-1 Manpower

One person, 2 minutes

8-10-2 Tools

Philips screwdriver

8-10-3 Preparations

1.) Power Off/Shutdown the system as described in 4-3-2 on page 4-4.

8-10-4 Removal Procedure

1.) Unscrew 3 screws beneath of the FOOTREST COVER. Refer to the figure below.

Figure 8-18 Unscrewing 3 screws

2.) Remove the FOOTREST COVER. Refer to the figure below.

Figure 8-19 Removing FOOTREST COVER

8-10-5 Installation Procedure

1.) Install the new parts in the reverse order of removal.

Section 8-11
Replacement of the SIDE TRAY

8-11-1 Manpower

One person, 2 minutes

8-11-2 Tools

Philips screwdriver

8-11-3 Preparations

1.) Power Off/Shutdown the system as described in 4-3-2 on page 4-4.

8-11-4 Removal Procedure

1.) Unscrew 2 screws and remove the SIDE TRAY. Refer to the figure below.

Figure 8-20 Unscrewing 2 screws and remove SIDE TRAY ASSY

8-11-5 Installation Procedure

1.) Install the new parts in the reverse order of removal.

Section 8-12
Replacement of the OP COVER L,R

8-12-1 Manpower

One person, 5 minutes

8-12-2 Tools

Philips screwdriver

8-12-3 Preparations

1.) Power Off/Shutdown the system as described in 4-3-2 on page 4-4.

8-12-4 Removal Procedure

1.) Remove 2 RUBBER CAPS from the OPIO COVER. Refer to the figure below.

Figure 8-21 Removing the RUBBER CAP

2.) Unscrew 2 screws, then remove the OPIO COVER L, R from. Refer to the figure below.

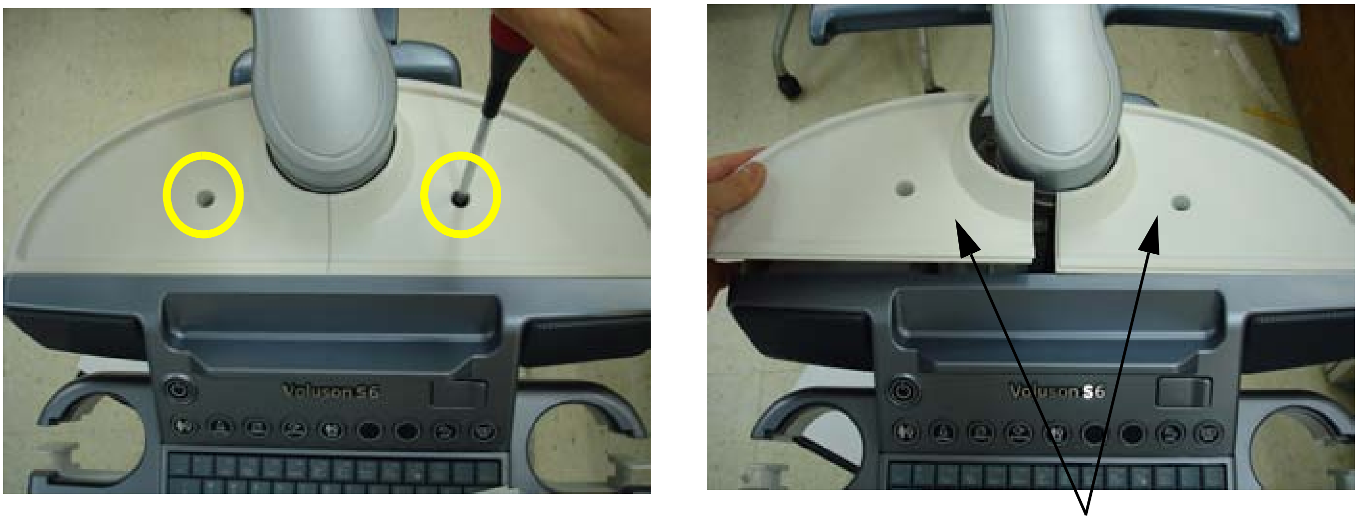


Figure 8-22 Removing the OPIO COVER L, R

8-12-5 Installation Procedure

1.) Install the new parts in the reverse order of removal.

Section 8-13
Replacement of the Caps for Hardkeys

NOTICE Please observe that replacement procedure depend on key caps that have to be replaced!
- if just the circle key caps have to be replaced.
- if trackball buttons or mode key slices have to be replaced too, please contact your local distributor or GE service representative.

8-13-1 Replacement of Circle Key Caps only

8-13-1-1 Manpower

One person, approx. 1 minute/cap

8-13-1-2 Tools

Small-sized slotted screwdriver or tweezers.

8-13-1-3 Circle Key Caps - Replacement Procedure

1.) By means of a small slotted screwdriver, carefully push against the circle hardkey cap.
2.) Lift the cap, until it is completely loosened from its base.
3.) Place the new hardkey cap down until it snaps into position.

Figure 8-23 Push against the circle cap and lift it

Section 8-14
Replacing optional Peripherals

NOTICE Normally auxiliary devices and peripherals come pre-installed with the Voluson® S8 / Voluson® S6 system.

8-14-1 Manpower

One person, 70 minutes

8-14-2 Tools

Standard Field Service Tool Kit

NOTICE READ and UNDERSTAND these instructions thoroughly before proceeding with the installation. Perform each step in sequence and check it off when completed. If a problem occurs after completion, go back through the procedure and check for implementation errors before contacting your Ultrasound Region.

CAUTION **Possible Operational damage. Failure to strictly follow ESD (Electrostatic Discharge) precautions during this installation may cause constant or intermittent operational abnormalities. Strictly follow all precautions.**

8-14-3 Printer Installation (BW and Color)

BW Printer: SONY UP-D897,Mitsubishi P95D , Color Printer: SONY UP-D25MD

8-14-3-1 BW PRINTER Installation for Standard Configuration (MID CABINET)

1.) Remove MID CABINET ASSY.

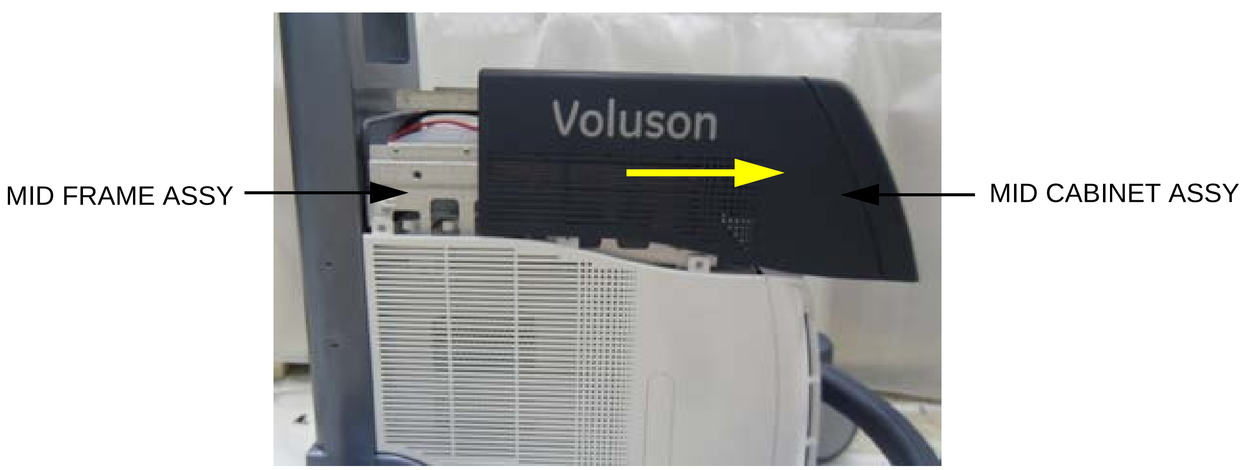
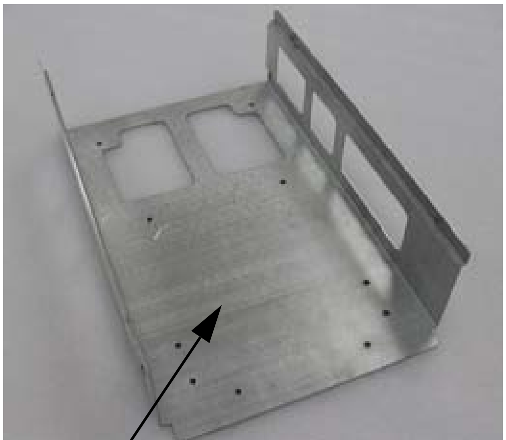


Figure 8-24 Moving forward MID CABINET ASSY following Slide Rail

2.) Fix BW PRINTER with COLOR PRINTER BRKT POLARIS.



COLOR PRINTER BRKT POLARIS

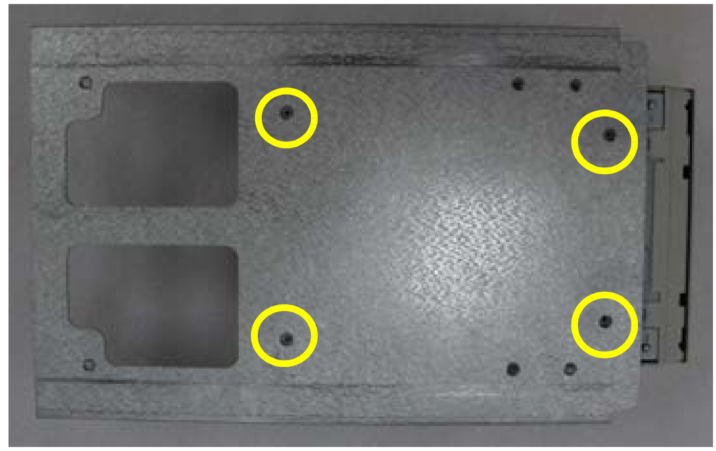
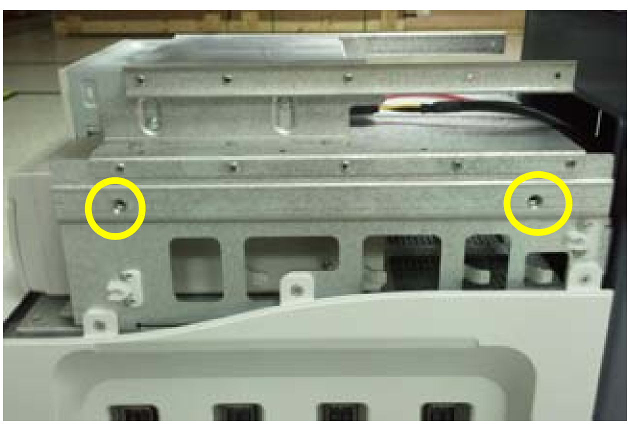


Figure 8-25 Fix BW PRINTER to COLOR PRINTER BRKT POLARIS with 4 screws (2306562, FH M3X6)

3.) Insert BW PRINTER ASSY to MID FRAME ASSY.

Figure 8-26 Insert BW PRINTER ASSY to MID FRAME ASSY

4.) Assemble BW PRINTER ASSY with 4 screws.



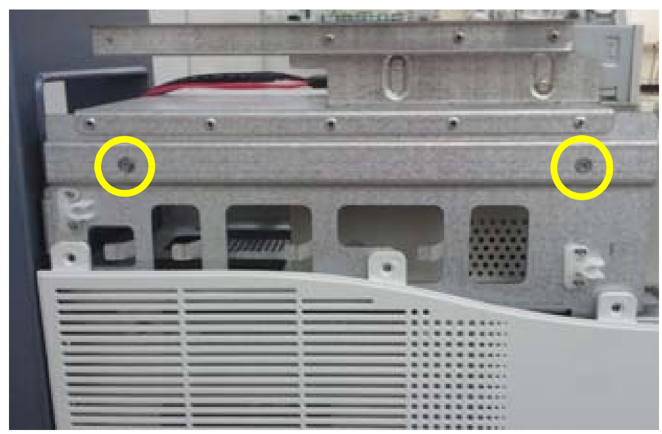


Figure 8-27 Assemble BW PRINTER ASSY to MID FRAME ASSY with 4 screws (5178673, SCREW FH M4X6)

5.) Remove REAR COVER POLARIS ASSY.

Figure 8-28 Unscrew 5 screws and remove REAR COVER POLARIS ASSY

6.) Connect DVD/BW PRINTER CABLE.

a.) DVD CABLE

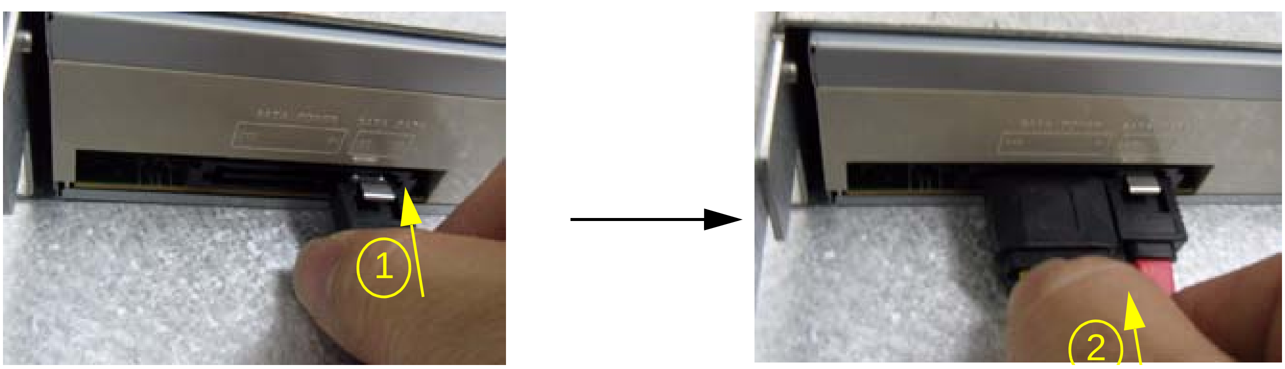


Figure 8-29 Connect DVD CABLE

b.) BW PRINTER CABLE

Figure 8-30 Connect BW PRINTER CABLE

7.) Remove DUMMY COVER COLOR PRINTER from MID CABINET ASSY.

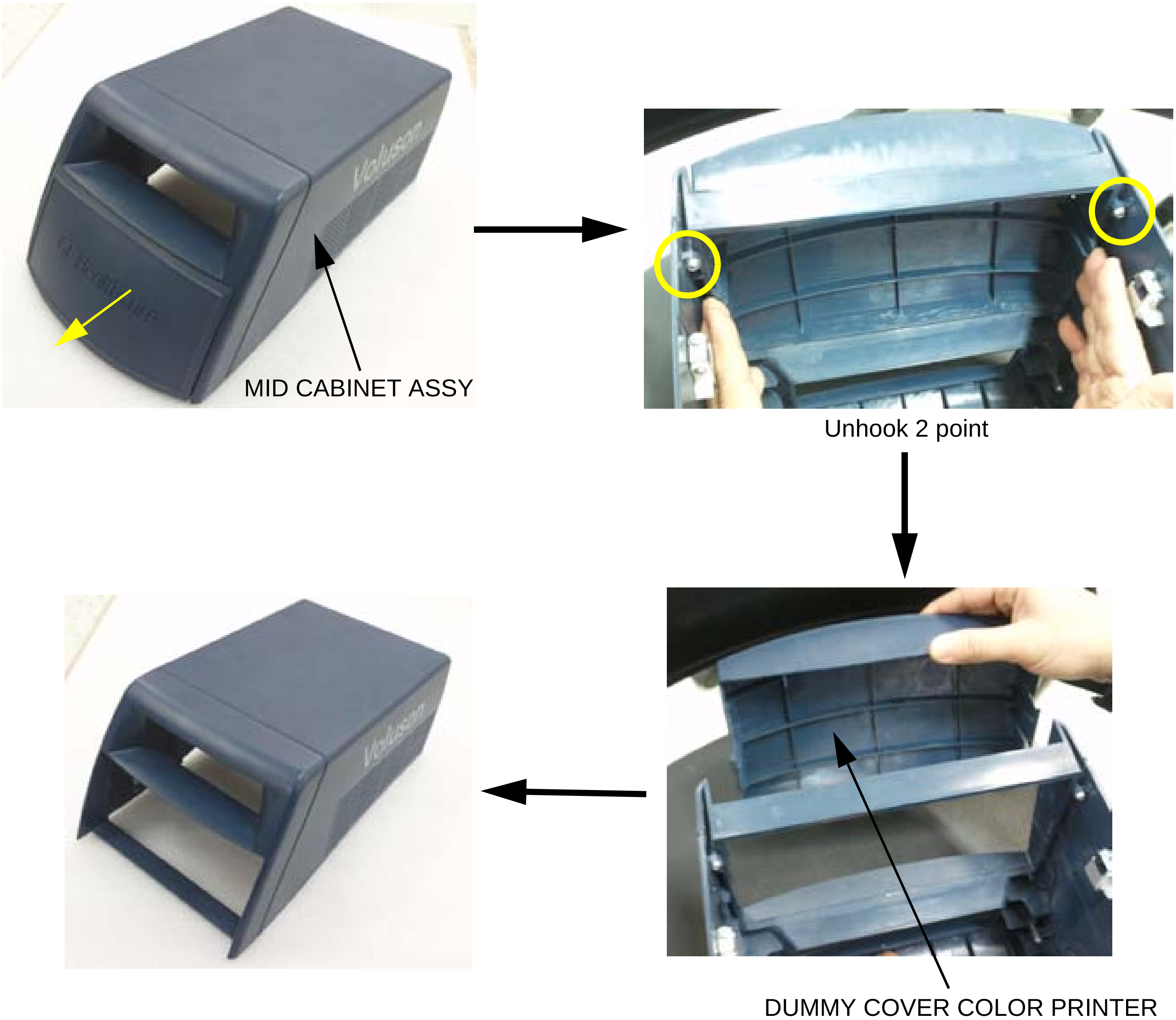


Figure 8-31 Remove DUMMY COLOR PRINTER From MID CABINET ASSY

8.) Assemble DUMMY CASE MID BW POLARIS with MID CABINET ASSY.

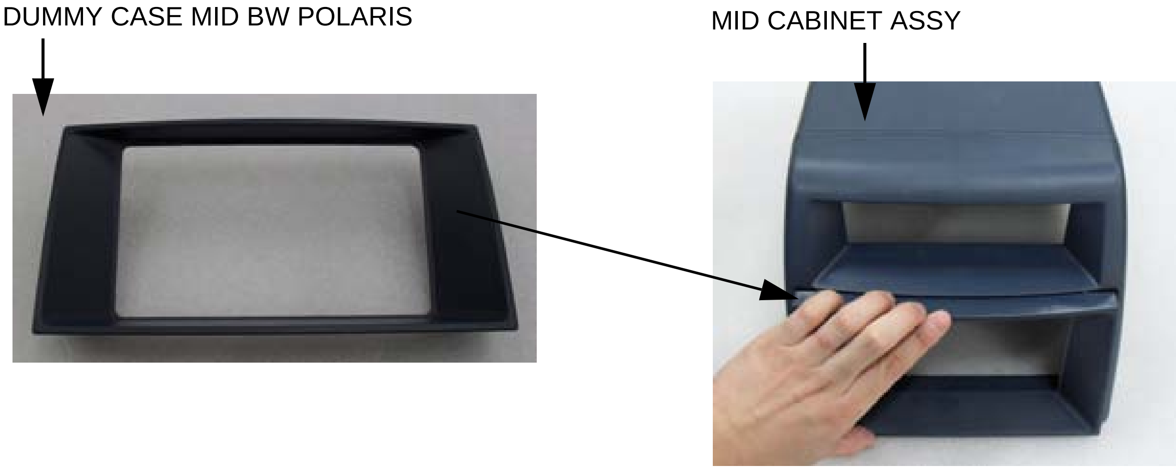


Figure 8-32 Assemble DUMMY CASE MID BW POLARIS with MID CABINET ASSY

9.) Assemble MID CABINET ASSY.

Figure 8-33 Assemble MID CABINET ASSY

8-14-3-2 BW PRINTER Installation for HIGH CABINET Option Configuration

1.) Remove HIGH CABINET ASSY.

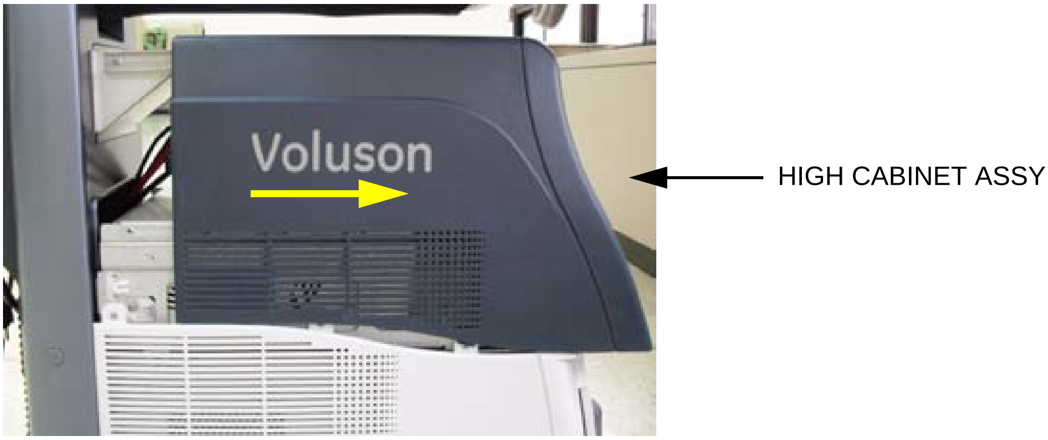


Figure 8-34 Moving forward HIGH CABINET ASSY following Slide Rail

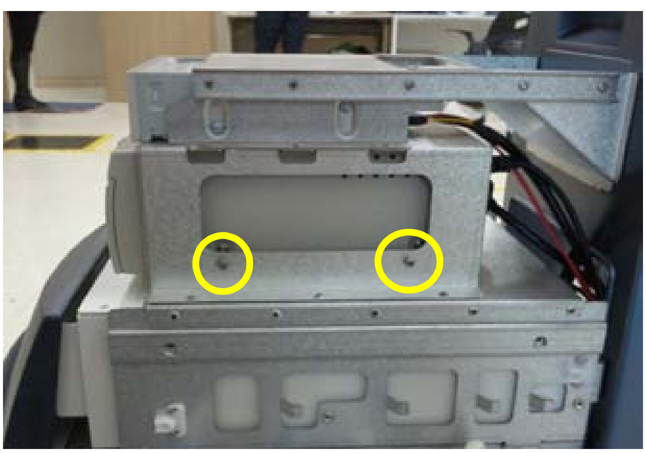
2.) Fix BW PRINTER with BW BRKT POLARIS.

Figure 8-35 Fix BW PRINTER to BW BRKT POLARIS with 4 screws (2306562, FH M3X6)

3.) Insert BW PRINTER ASSY to HIGH FRAME ASSY.

Figure 8-36 Insert BW PRINTER ASSY to HIGH FRAME ASSY

4.) Assemble BW PRINTER ASSY to HIGH FRAME ASSY with 4 screws.



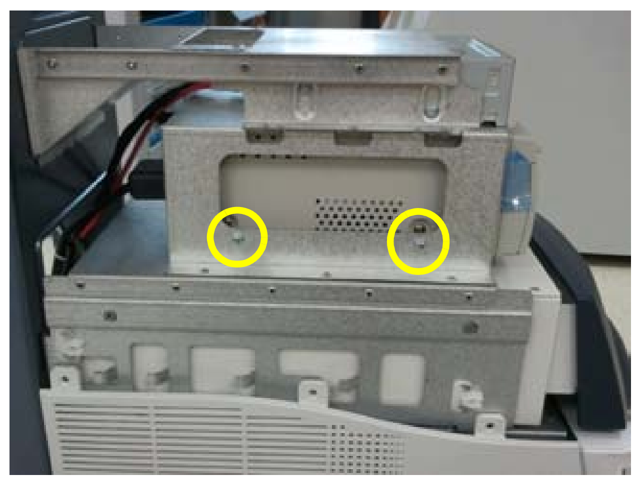


Figure 8-37 Assemble BW PRINTER ASSY to HIGH FRAME ASSY with 4 screws (2159625, W/SP M4X8)

5.) Remove REAR COVER POLARIS ASSY. Refer to Figure 8-28 on page 8-27.

6.) Connect DVD/BW and COLOR PRINTER CABLE.

a.) DVD CABLE - Figure 8-29 on page 8-27.

b.) BW PRINTER CABLE - Figure 8-30 on page 8-27

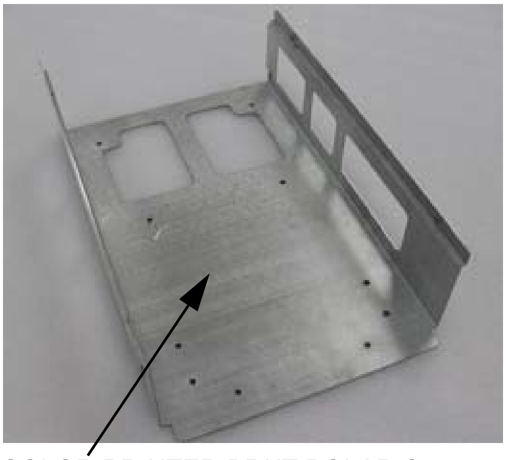
7.) Assemble HIGH CABINET ASSY

Figure 8-38 Assemble HIGH CABINET ASSY

8-14-3-3 COLOR PRINTER Installation for standard Configuration(MID CABINET)

1.) Remove MID CABINET ASSY. Refer to Figure 8-24 on page 8-24.

2.) Fix COLOR PRINTER with COLOR PRINTER BRKT POLARIS.



COLOR PRINTER BRKT POLARIS

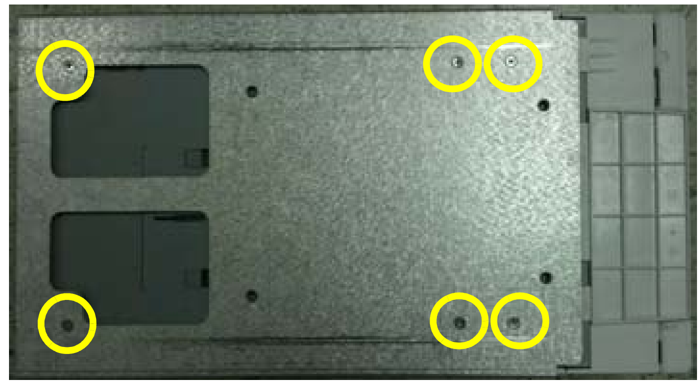
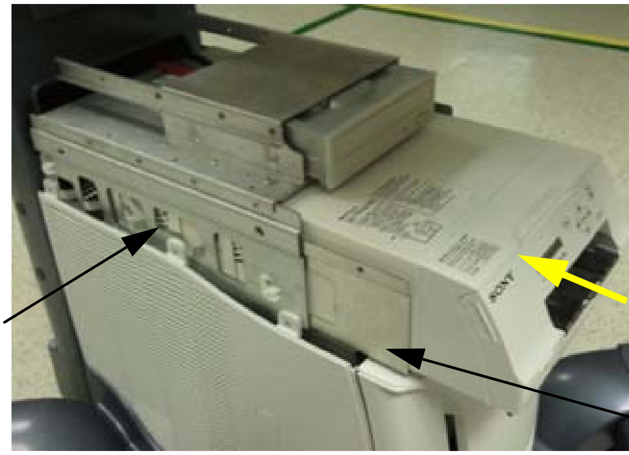


Figure 8-39 Fix COLOR PRINTER to COLOR PRINTER BRKT POLARIS with 6 screws (2306562, FH M3X6)

3.) Insert COLOR PRINTER ASSY to MID FRAME ASSY.

MID FRAME ASSY



COLOR PRINTER ASSY

Figure 8-40 Insert COLOR PRINTER ASSY to MID FRAME ASSY

4.) Assemble COLOR PRINTER ASSY with 4 screws

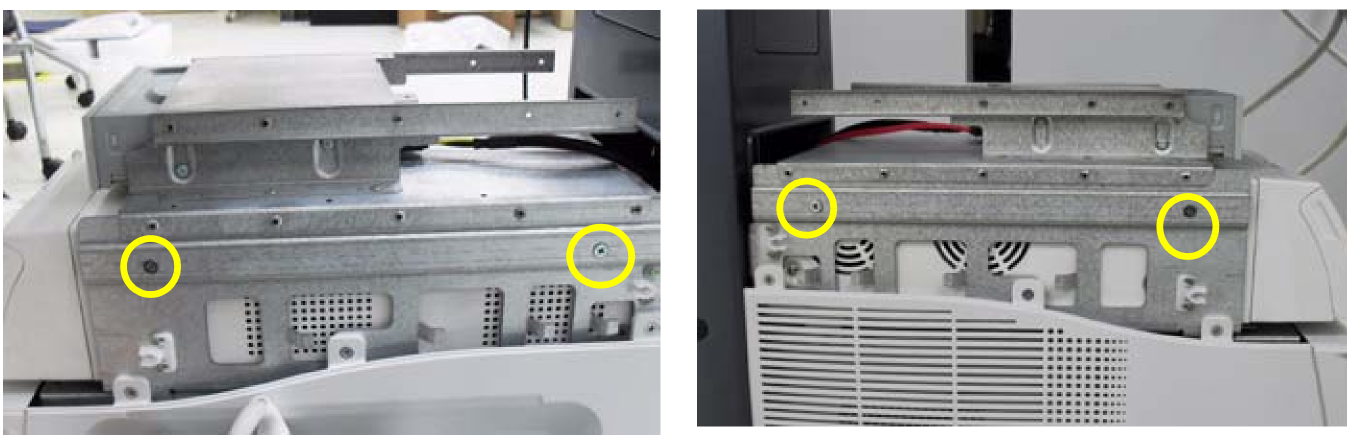


Figure 8-41 Assemble COLOR PRINTER ASSY to MID FRAME ASSY with 4 screws (5178673, FH M4X6)

5.) Remove REAR COVER POLARIS ASSY. Refer to Figure 8-28 on page 8-27.

6.) Connect DVD/BW and COLOR PRINTER CABLE.

a.) DVD CABLE - Figure 8-29 on page 8-27.

b.) COLOR PRINTER CABLE

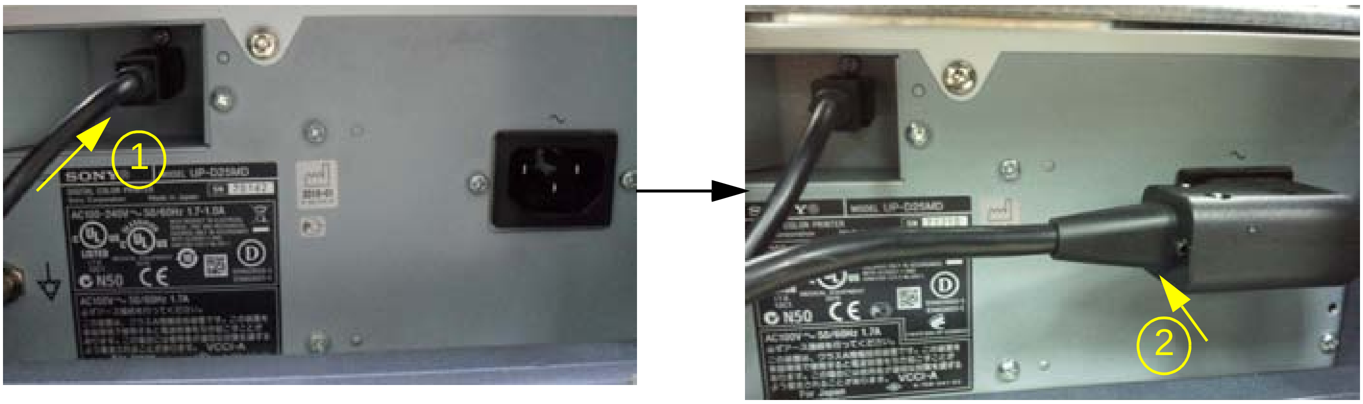


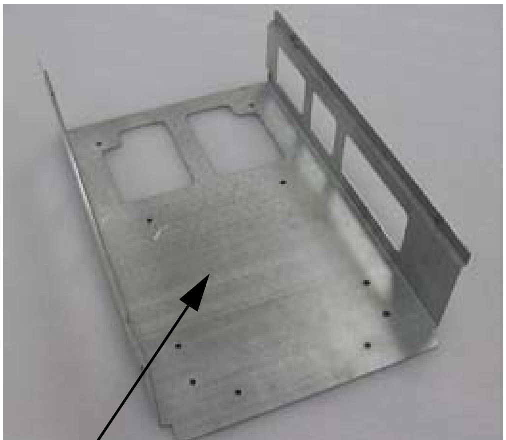
Figure 8-42 Connect COLOR PRINTER CABLE

7.) Assemble MID CABINET ASSY.

Figure 8-43 Assemble MID CABINET ASSY

8-14-3-4 COLOR PRINTER Installation for HIGH CABINET Option Configuration

1.) Remove MID CABINET ASSY. Refer to Figure 8-34 on page 8-30.
2.) Fix COLOR PRINTER with COLOR PRINTER BRKT POLARIS.



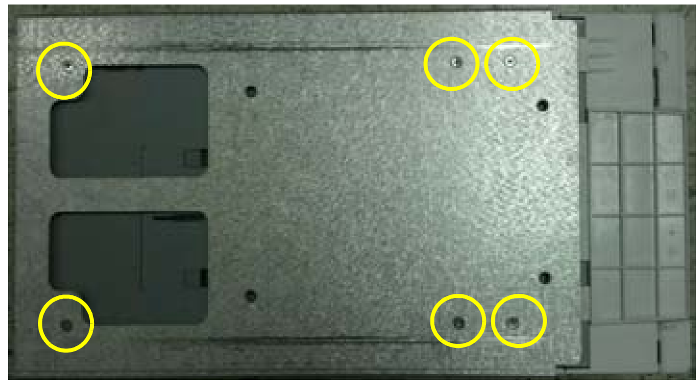


Figure 8-44 Fix COLOR PRINTER to COLOR PRINTER BRKT POLARIS with 6 screws (2306562, FH M3X6)

3.) Insert COLOR PRINTER ASSY to HIGH FRAME ASSY.

Figure 8-45 Insert COLOR PRINTER ASSY to HIGH FRAME ASSY

4.) Assemble COLOR PRINTER ASSY with 4 screws.

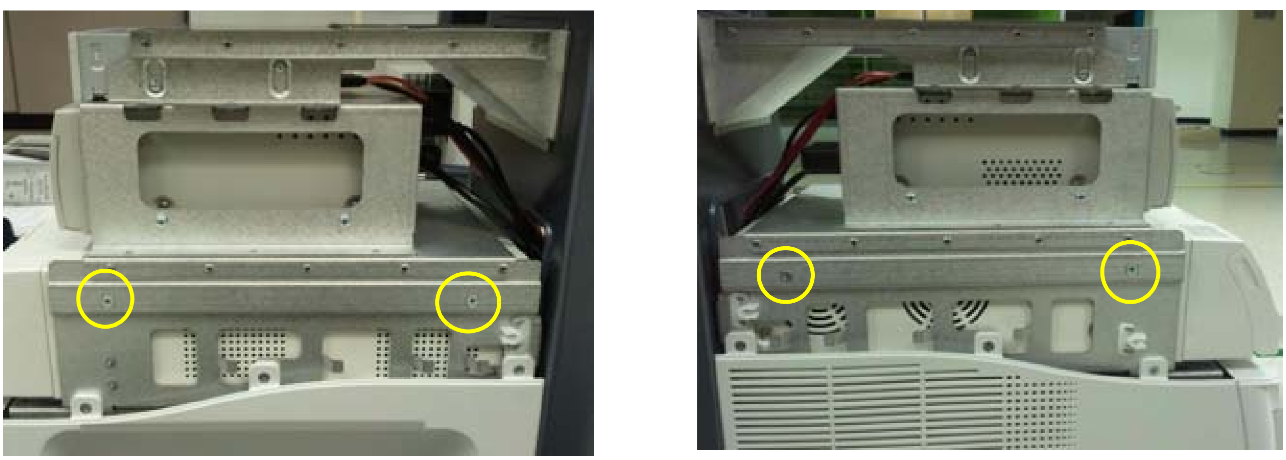


Figure 8-46 Assemble COLOR PRINTER ASSY to HIGH FRAME ASSY with 4 screws (5178673, FH M4X6)

5.) Remove REAR COVER POLARIS ASSY. Refer to Figure 8-28 on page 8-27.

6.) Connect DVD/BW and COLOR PRINTER CABLE.

a.) DVD CABLE - Figure 8-29 on page 8-27.

b.) BW PRINTER CABLE -Figure 8-30 on page 8-27

c.) COLOR PRINTER CABLE - Figure 8-42 on page 8-35

7.) Assemble HIGH CABINET ASSY

Figure 8-47 Assemble HIGH CABINET ASSY

8-14-4 High Cabinet Option Installation

1.) Remove MID CABINET ASSYN from MID FRAME ASSY.

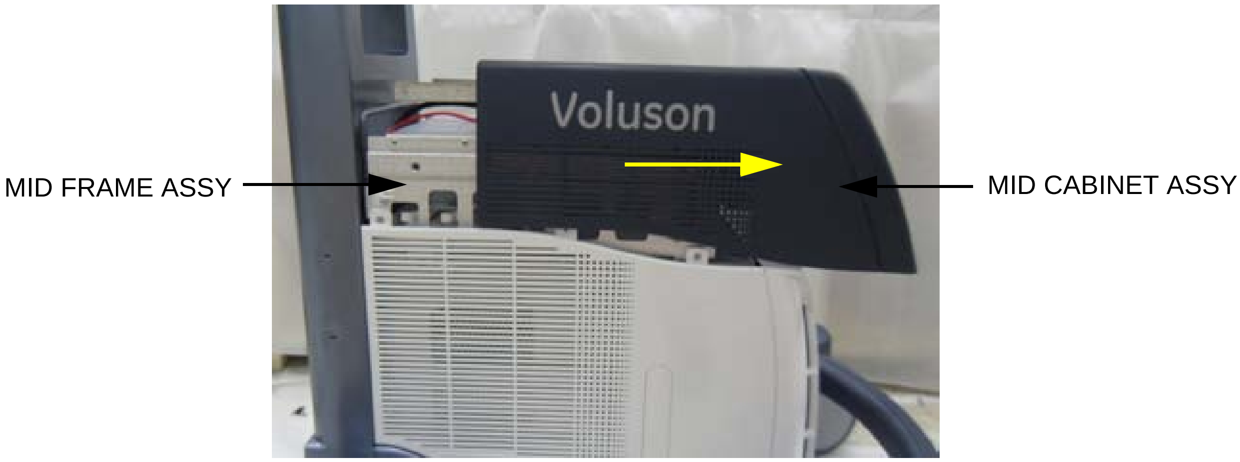


Figure 8-48 Moving forward MID CABINET ASSY following Slide Rail

2.) Remove FRONT COVER ASSY.

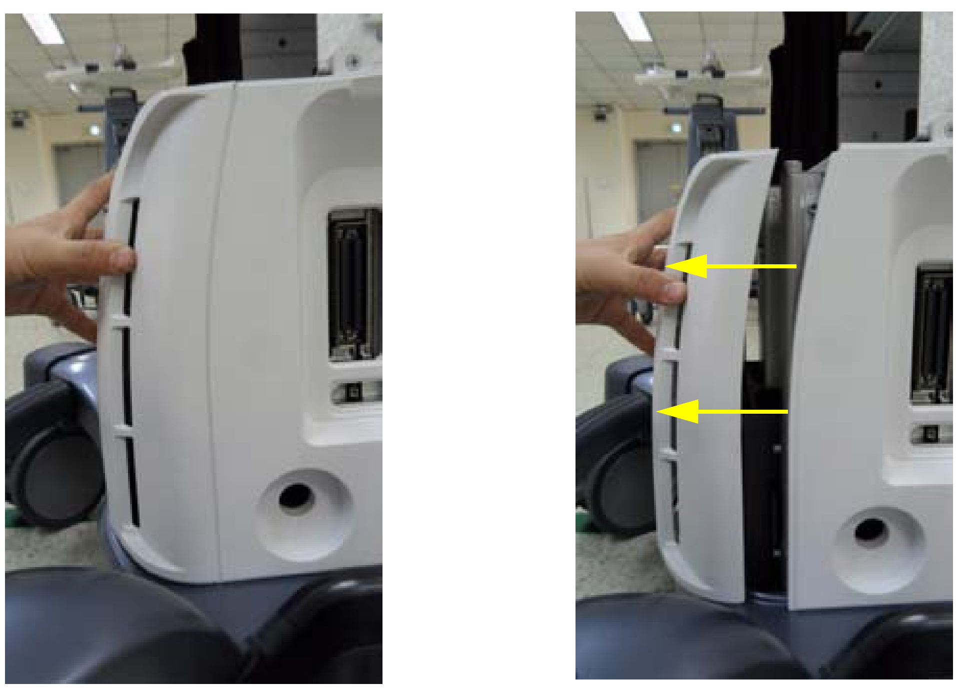


Figure 8-49 Remove FRONT COVER ASSY

3.) Remove RS Knob.

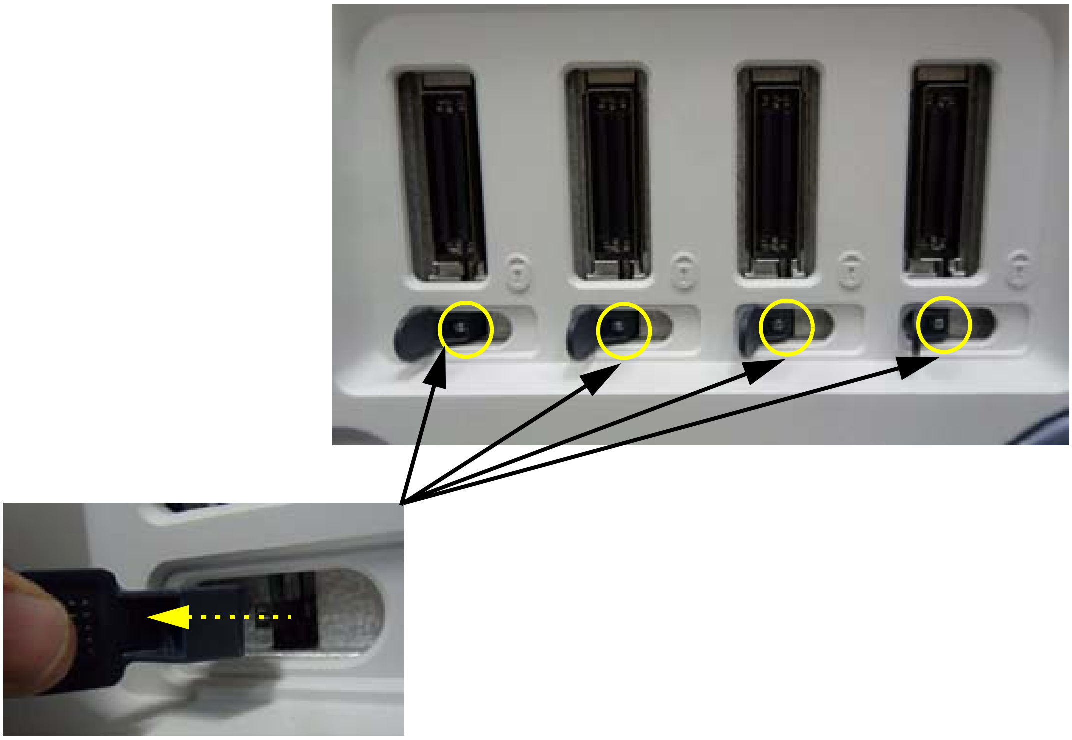


Figure 8-50 Unscrew 4 screws and separate 4 RS Knob

4.) Remove SIDE COVER R ASSY.

Figure 8-51 Unscrew 3 screws to remove SIDE COVER R ASSY

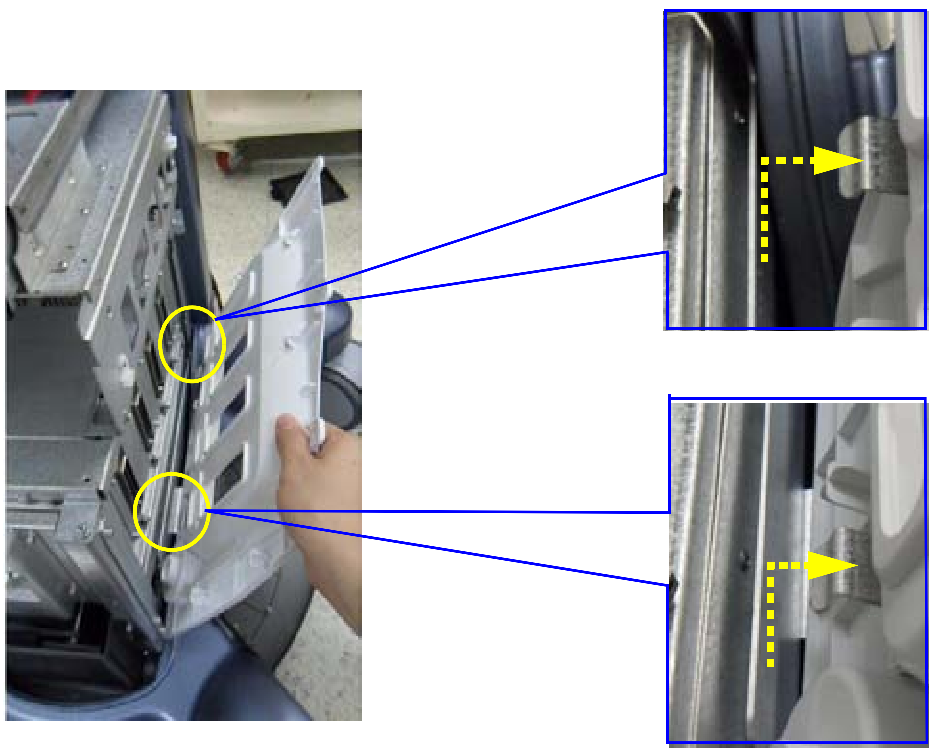


Figure 8-52 Remove SIDE COVER R ASSY

5.) Remove SIDE COVER L ASSY.

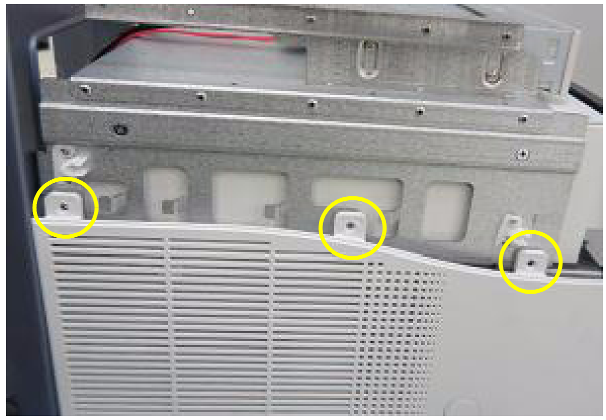


Figure 8-53 Unscrew 3 screws to remove SIDE COVER L ASSY

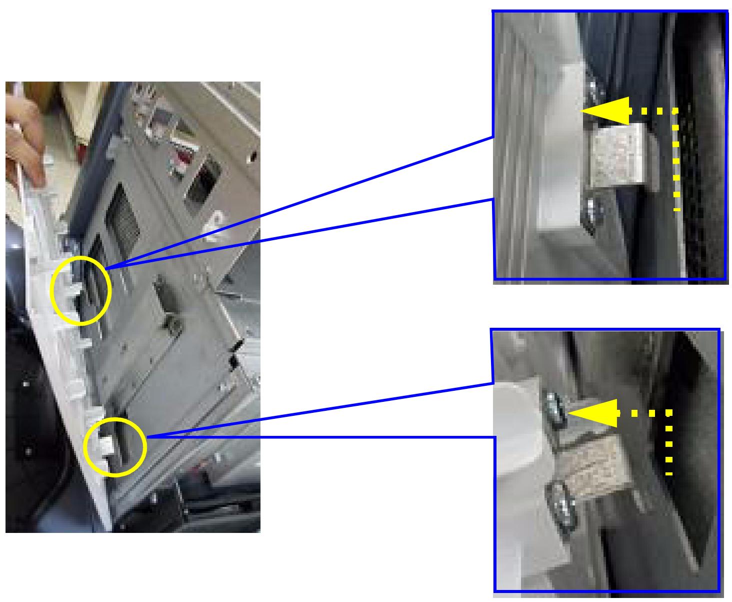


Figure 8-54 Remove SIDE COVER L ASSY

6.) Disconnect DVD CABLE.

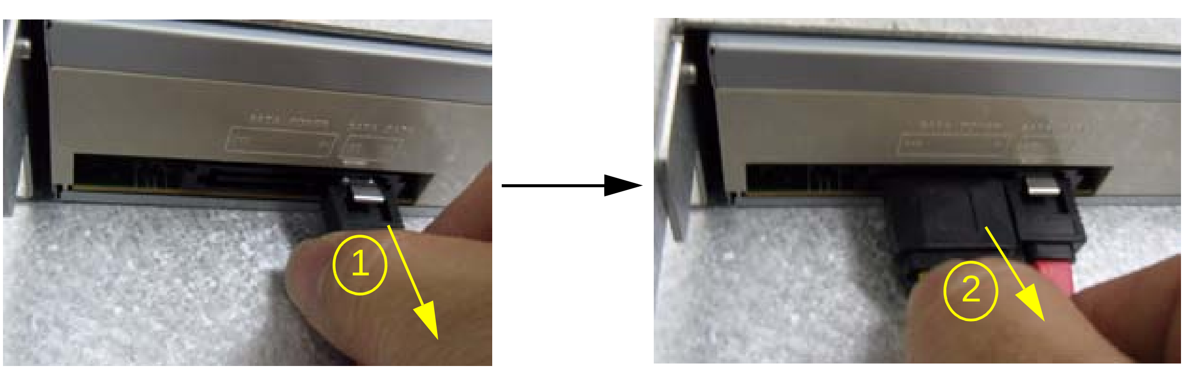


Figure 8-55 Disconnect DVD CABLE

7.) Remove DVD from MID FRAME ASSY.

Figure 8-56 Unscrew 4 screws to remove the DVD (Left / Right)

Figure 8-57 Remove DVD from MID FRAME ASSY

8.) Remove MID FRAME ASSY from MAIN FRAME ASSY.

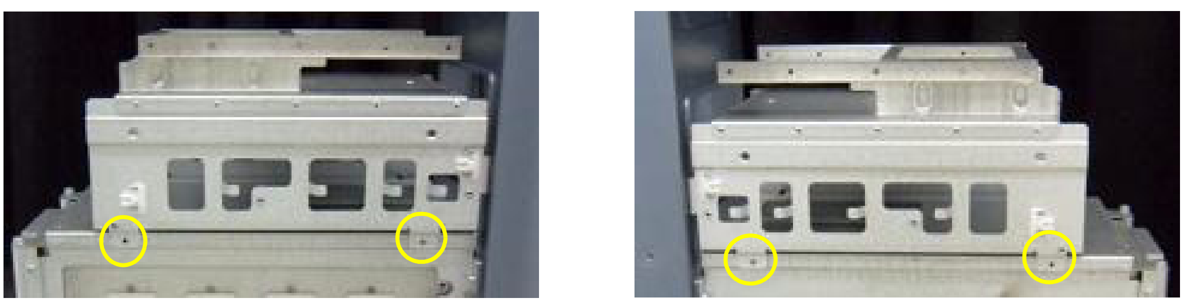


Figure 8-58 Unscrew 4 screws and remove MID FRAME ASSY

9.) Remove REAR COVER POLARIS ASSY.

Figure 8-59 Unscrew 5 screws and remove REAR COVER POLARIS ASSY

10.)Remove SPEAKER DUMMY BACK COVER BRKT

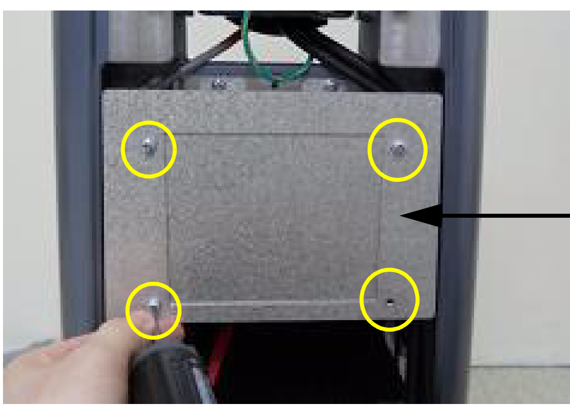


Figure 8-60 Unscrew 4 screws and remove SPEAKER DUMMY BACK COVER BRKT

11.) Remove SPEAKER DUMMY BACK BRKT.

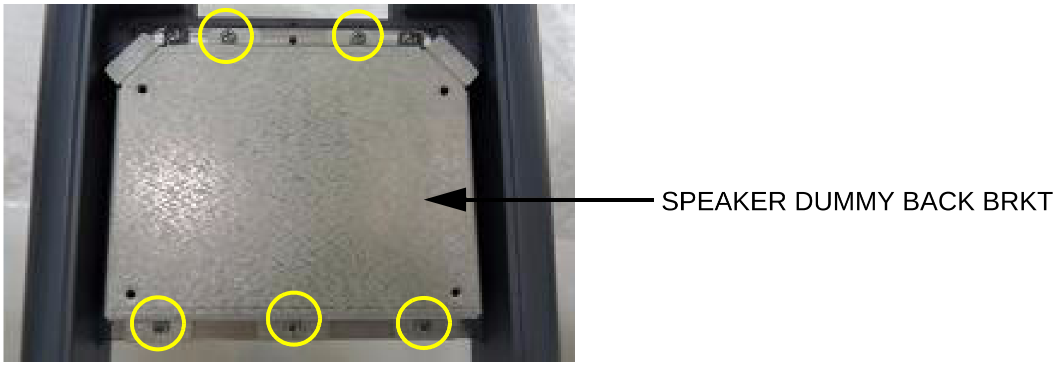


Figure 8-61 Unscrew 5 screws and remove SPEAKER DUMMY BACK BRKT

12.) Remove SPEAKER DUMMY BRKT.

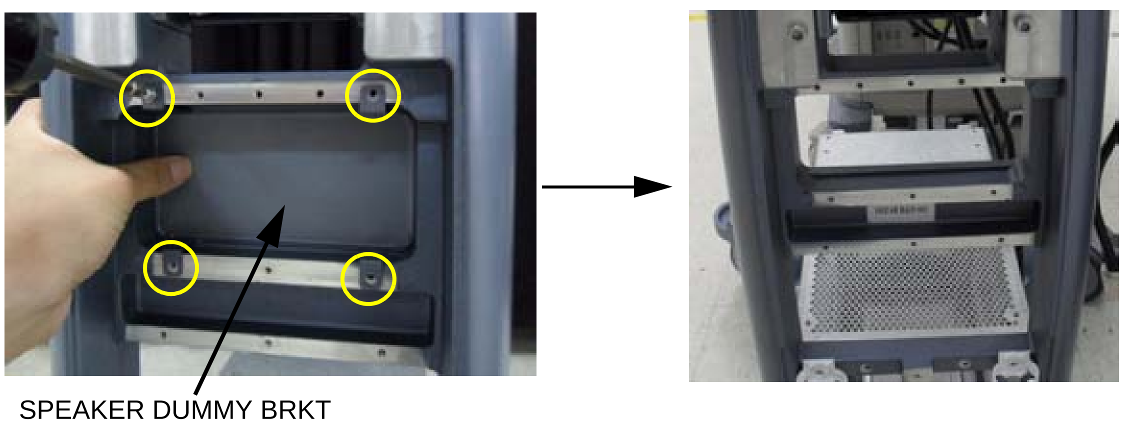


Figure 8-62 Unscrew 4 screws and remove SPEAKER DUMMY BRKT

13.) Remove CABLE COVER BRKT POLARIS (In case of USB cable needs to be changed).

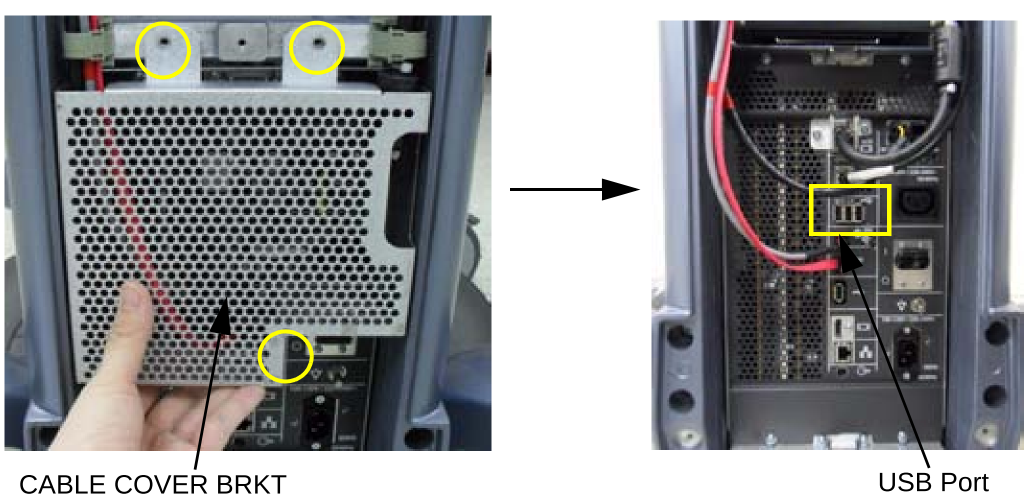


Figure 8-63 Unscrew 3 screws and remove CABLE COVER BRKT

14.) Place HIGH FRAME GROUND BRKT on BACKBONE (HIGH CABINET only).

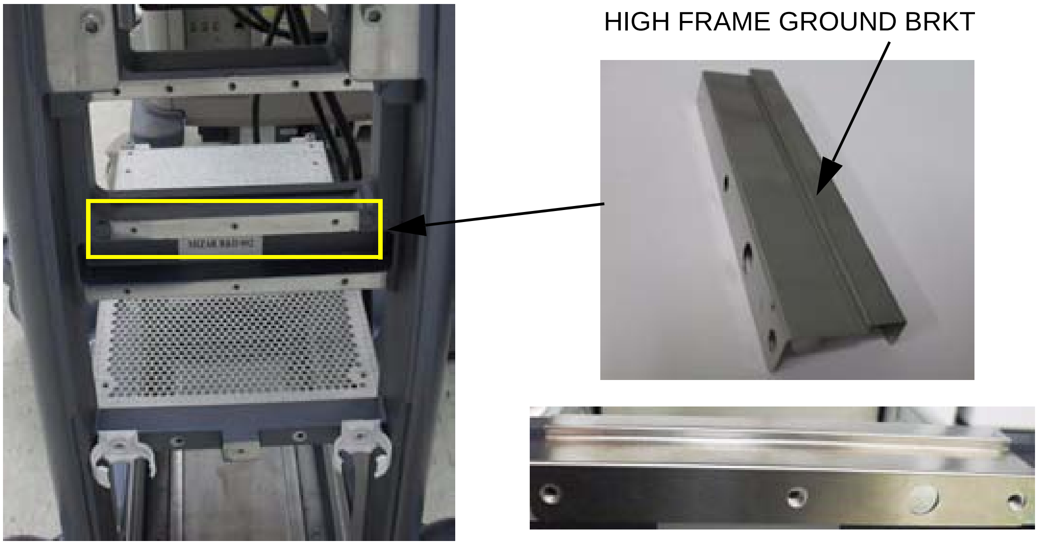


Figure 8-64 Place HIGH FRAME GROUND BRKT on BACKBONE

15.) Place SPEAKER DUMMY BRKT over the HIGH FRAME GROUND BRKT on BACKBONE (HIGH CABINET only).

Figure 8-65 Place SPEAKER DUMMY BRKT on the HIGH FRAME GROUND BRKT

16.) Assemble SPEAKER DUMMY BRKT with 5 screws.

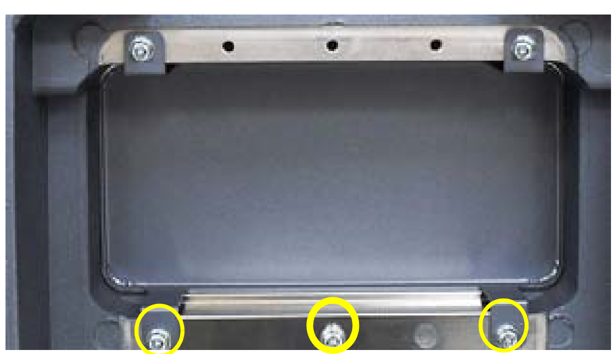


Figure 8-66 Assemble HIGH FRAME GROUND BRKT with 5 screws (2159625, W/SP PH M4X8)

17.) Check that EMI GASKET is properly attached on HIGH FRAME POLARIS (HIGH CABINET Option only).

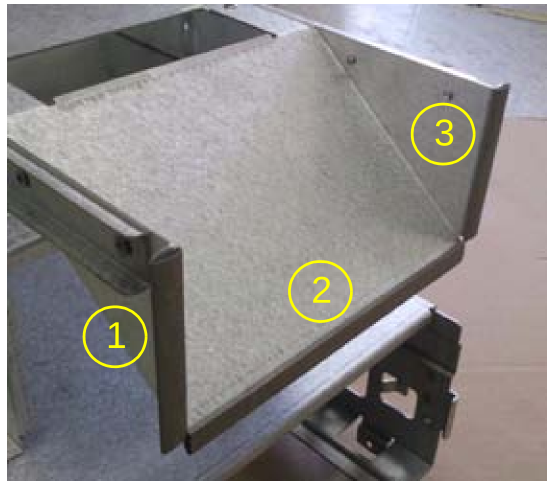


Figure 8-67 Attach EMI GASKET on HIGH FRAME POLARIS

Table 8-3 Specification of EMI GASKET

NO	GEPN	NAME	W	T	L
1	5304318	EMC GASKET IT5-7-2-1000-15	7.0	2.0	60
2					150
3					60

18.) Assemble HIGH FRAME ASSY on MAIN FRAME.

Figure 8-68 Assemble with 4 screws (2159625, W/SP PH M4X8)

19.) PRINTER installation - Refer to Chapter 8-14-3 Printer Installation (BW and Color).

20.) DVD installation procedure is in reverse order of remove procedure -Refer to part 6.), 7.) of this Section

21.) SIDE COVER ASSY (L/R) assemble procedure is in reverse order of remove procedure - Refer to Part 3.),4.),5.) of this Section

22.) FRONT COVER ASSY assemble procedure is in reverse order of remove procedure - Refer to Part 2.) of this Section.

23.) Installation of ELEVATION ARM DOWN STOPPER for HIGH CABINET Option Configuration.

a.) Remove LOWER GROUND CABLE POLARIS.

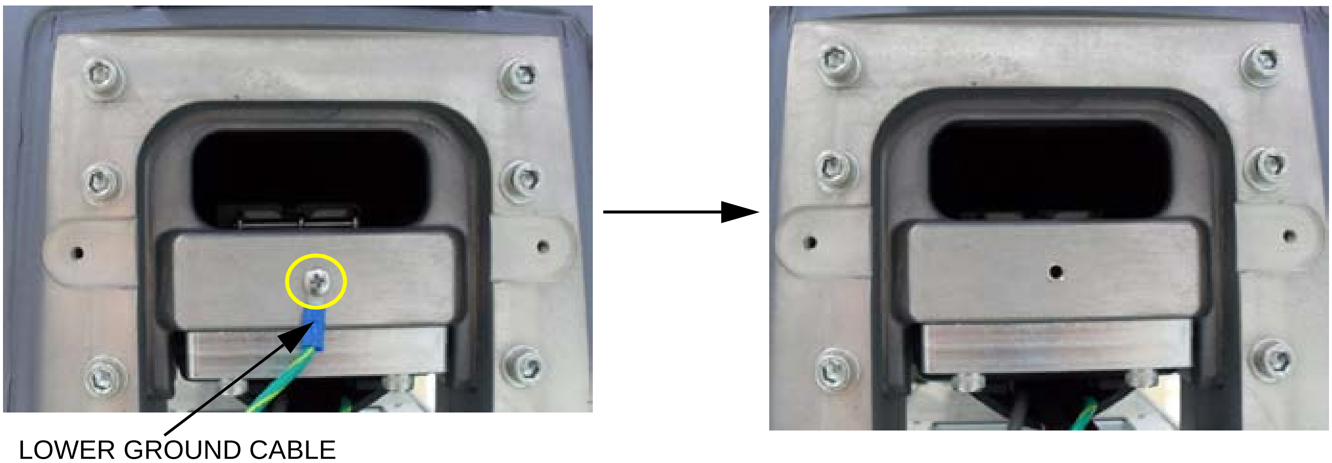


Figure 8-69 Unscrew and disconnect LOWER GROUND CABLE POLARIS

b.) Remove ELEVATION ARM DOWN STOPPER MID MIZAR.

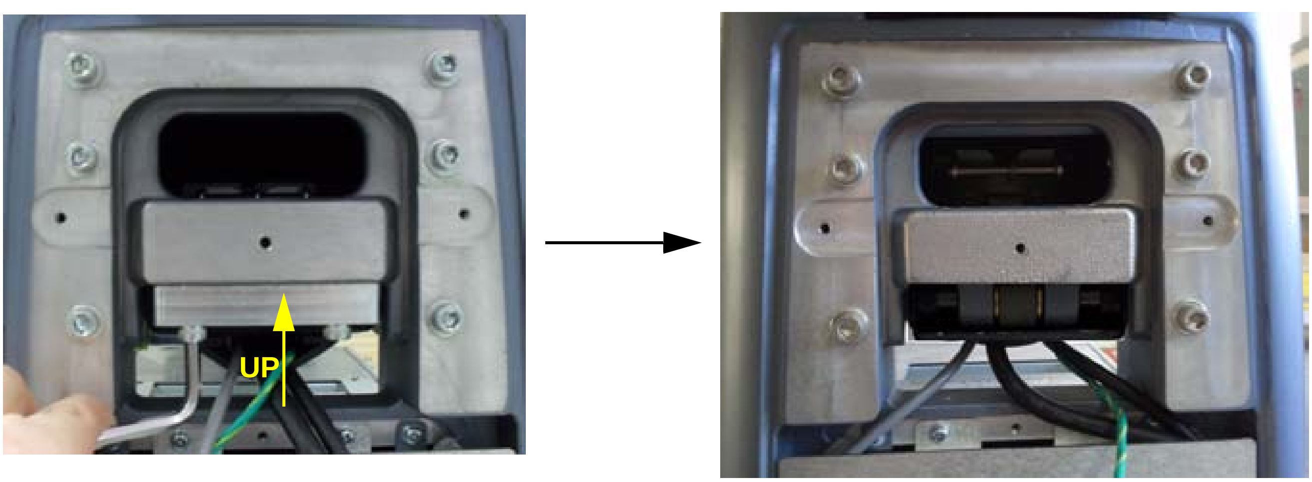


Figure 8-70 Unscrew and Remove ELEVATION ARM DOWN STOPPER MID MIZAR

c.) Change ELEVATION ARM DOWN STOPPER as High from Mid.

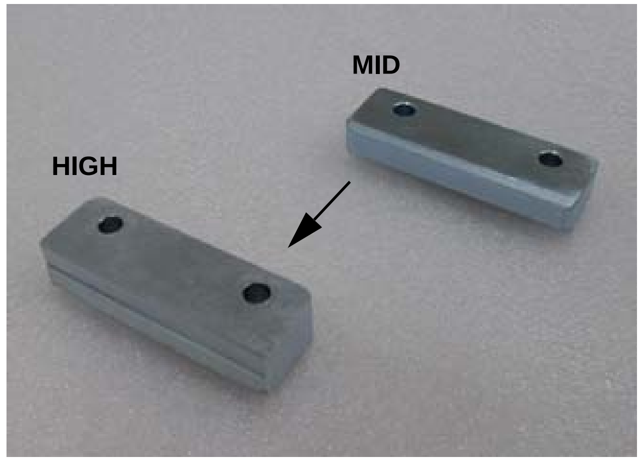
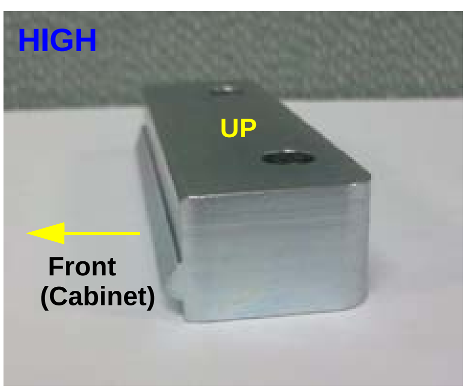


Figure 8-71 Shape of ELEVATION ARM DOWN STOPPER High and Mid

CAUTION **Beware the right direction of ELEVATION ARM DOWN STOPPER.**



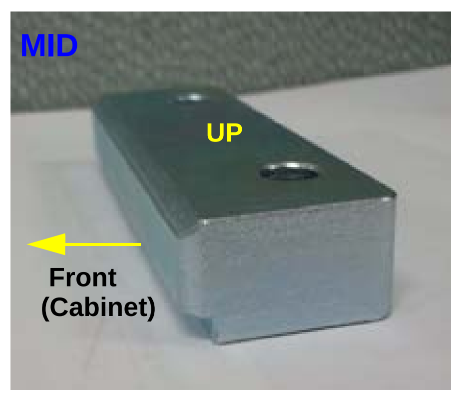


Figure 8-72 Direction of ELEVATION ARM DOWN STOPPER High and Mid

d.) Assemble ELEVATION ARM DOWN STOPPER HIGH POLARIS.

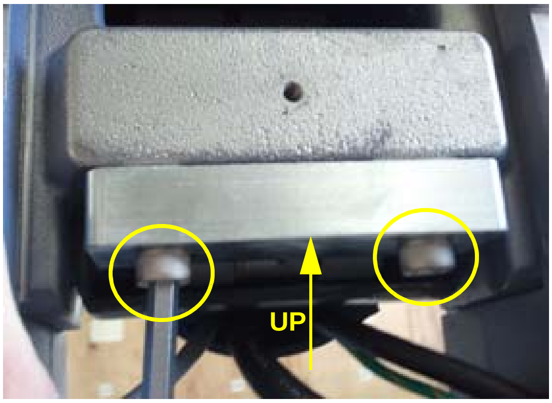


Figure 8-73 ELEVATION ARM DOWN STOPPER HIGH POLARIS with 2 Hexagonal screws (5405682, HSH M6x30)

NOTE: HSH SCREW Should be tightened proper torque (120kgf .cm)

e.) Fix LOWER GROUND CABLE POLARIS.

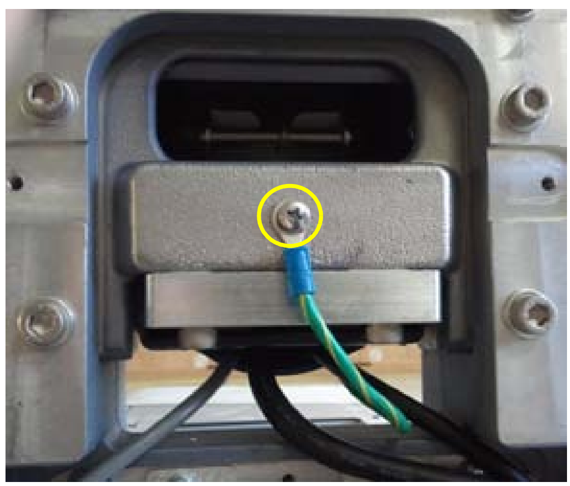


Figure 8-74 Fix LOWER GROUND CABLE POLARIS with screw (2159625, W/SP PH M4x8)

24.) REAR COVER and BRKT Assembly procedure is in reverse order of remove procedure. - Refer to Part 9.), 10.), 11.), 12.) and 13.) of this section.

25.) Assemble HIGH CABINET ASSY on HIGH FRAME ASSY.

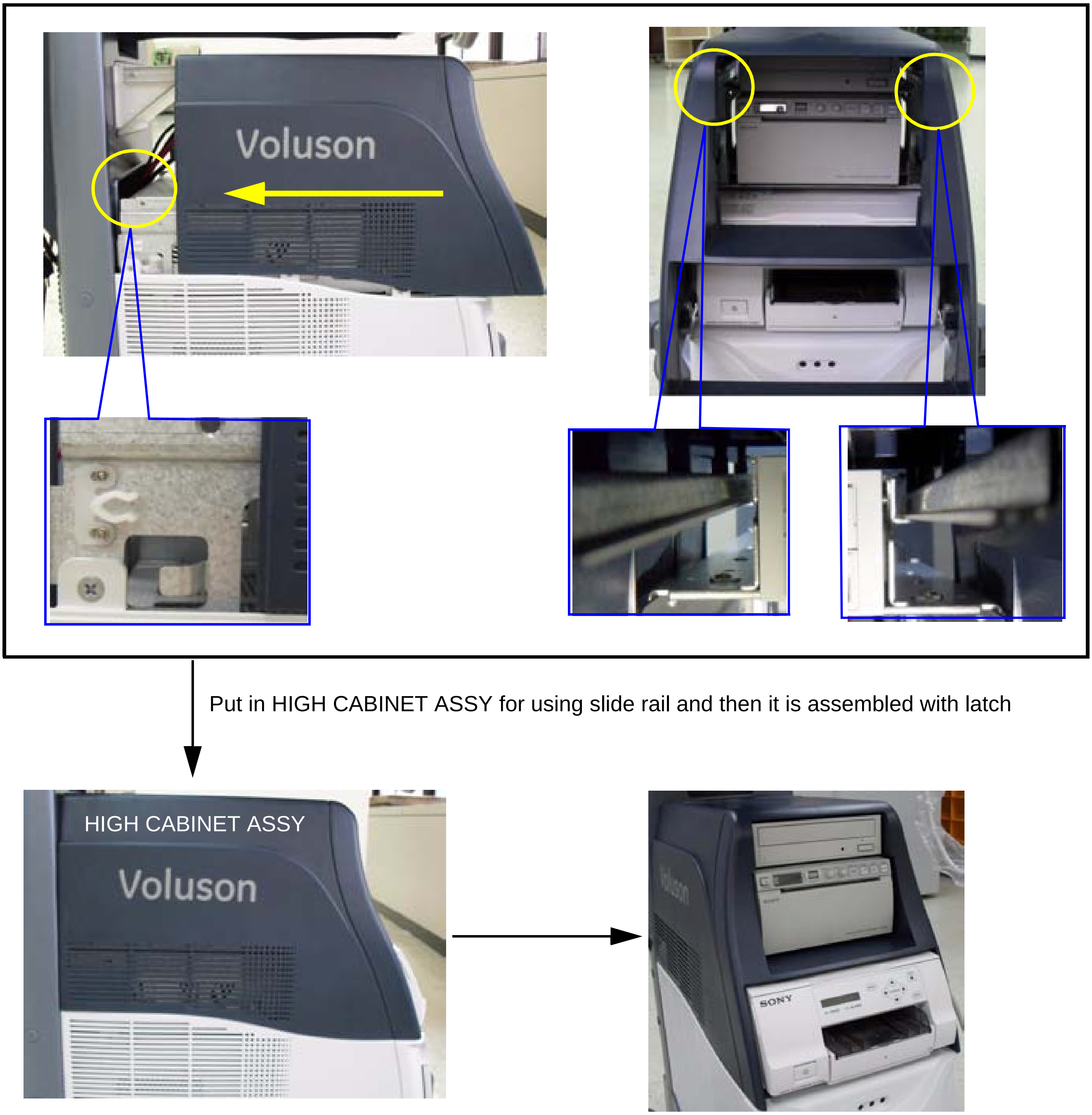


Figure 8-75 Assemble HIGH CABINET ASSY

8-14-5 Drawer Option Installation

8-14-5-1 Drawer Installation for Mid Cabinet Option

1.) Remove MID CABINET ASSY.

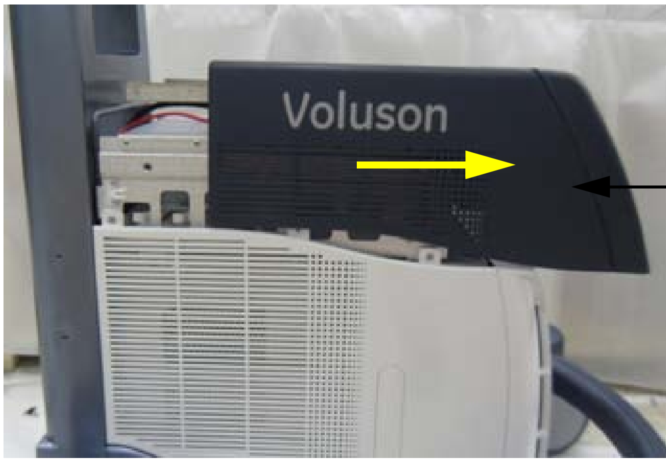


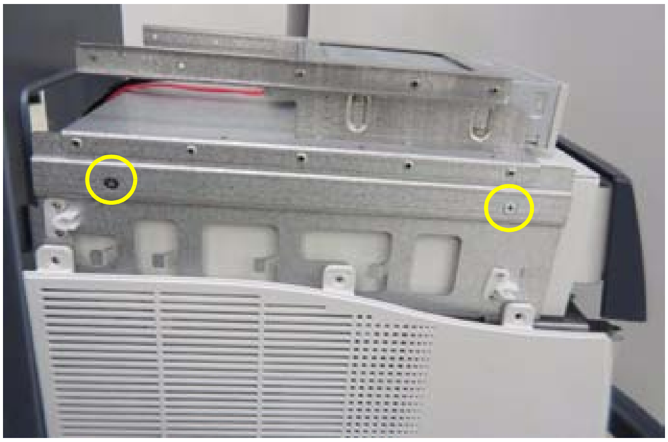
Figure 8-76 Moving forward MID CABINET ASSY following Slide Rail

2.) Procedure of Removing COLOR PRINTER is in reverse order of installation procedure. Refer to 8-14-3-3 on page 8-33.

3.) Place DRAWER ASSY on the MID FRAME ASSY.

Figure 8-77 Place DRAWER ASSY on the MID FRAME ASSY

4.) Assemble DRAWER with 4 screws.



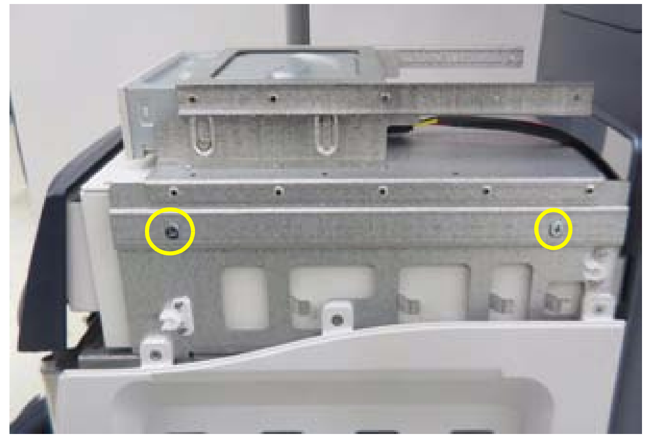


Figure 8-78 Assemble DRAWER to MID FRAME ASSY with 4 screws (5178673, FH M4X6)

5.) Assemble MID CABINET ASSY.

Figure 8-79 Place MID CABINET on MID FRAME and Moving toward BACKBONE

Figure 8-80 DRAWER Assembly for MID CABINET Option

8-14-5-2 Drawer Installation for high cabinet option

1.) DRAWER Installation for HIGH CABINET is same procedure of MID CABINET. Refer to 8-14-5-1 on page 8-52)

Figure 8-81 DRAWER Assembly for HIGH CABINET Option

8-14-6 HORIZONTAL TV PROBE HOLDER Installation

1.) Install HORIZONTAL TV PROBE HOLDER on the left side bottom of OPIO with 3 screws.

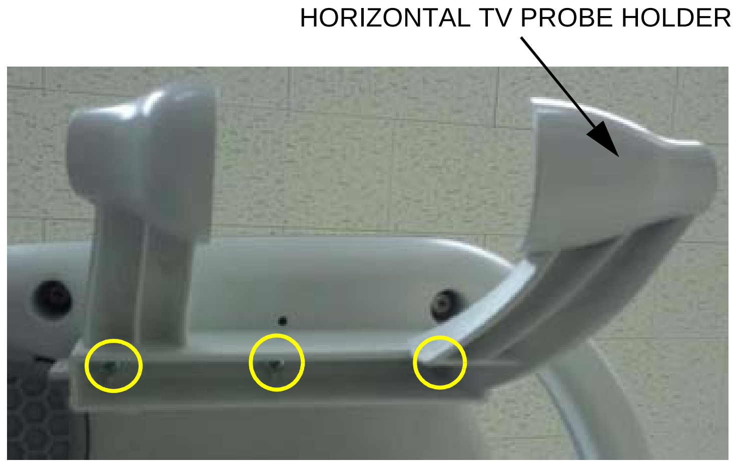


Figure 8-82 Assemble HORIZONTAL TV PROBE HOLDER with 3 screws (2306565, BH M4x16)

Figure 8-83 HORIZONTAL TV PROBE HOLDER is installed on Left Side only

8-14-7 VERTICAL TV PROBE HOLDER Installation

1.) Install VERTICAL TV PROBE HOLDER BASE on the right side bottom of OPIO with 2 screws.

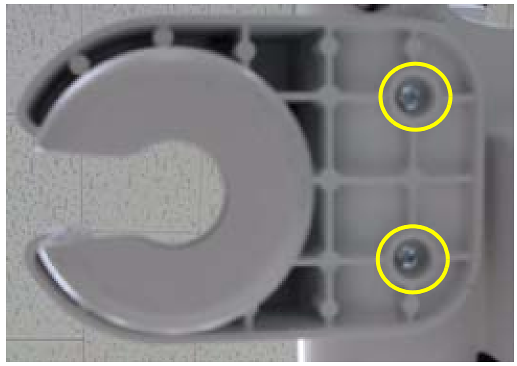


Figure 8-84 Assemble TV PROBE HOLDER BASE with 2 screws (2159634, BH M4x10)

2.) Place the TV PROBE HOLDER RUBBER on the PROBE HOLDER BASE.

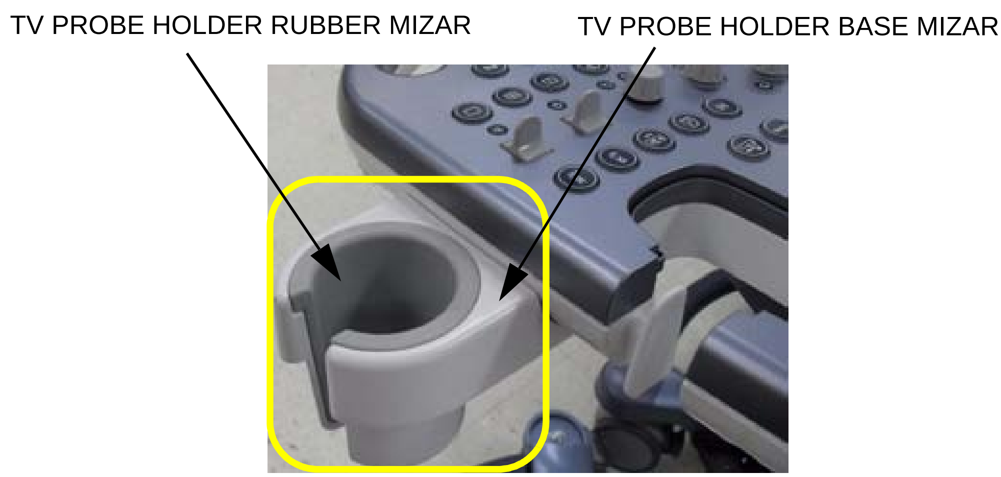


Figure 8-85 Insert TV PROBE HOLDER RUBBER to PROBE HOLDER BASE

Chapter 9
Renewal Parts

Section 9-1
Overview

9-1-1 Purpose of Chapter 9

This chapter gives an overview of replacement parts available for the Voluson® S8 / Voluson® S6.

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Table 9-1 Contents in Chapter 9

Section 9-2
List of Abbreviations

AC	Alternating Current
ADC	Analog to Digital Converter
A/N Key	Alpha Numeric Keys
ASIC	Application Specific Integrated Circuit
Assy	Assembly
BF64	64ch Beamformer module
BF128	128ch Beamformer module
CBP	Backplane interface module
CPS	Common Power Supply
CPU	Central Processing Unit
CSI	Common Status Indicator module
CWDM	Continuous wave doppler module
DAC	Digital to Analog Converter
DC	Direct Current
DSP	Digital Signal Processing
DVD	Digital Video Disc
DVI	Digital Visual Interface
ECGP	Electrocardiography module
EUM	Electronic User Manual
FRU 1	Replacement part available in parts hub
FRU 2	Replacement part available from the manufacturer (lead time involved)
HDD	Hard Disk Drive
Int	Internal
I/O	Input/Output
LCD	Liquid Crystal Display
PCI	Peripheral Component Interconnect
PWA	Printed Wire Assembly
RFS	Radio frequency module
SOM	System On Module
USB	Universal Serial Bus
CRU	Customer replaceable unit

Section 9-3
Parts List Groups

Figure 9-1 Console Views

Table 9-2 Mechanical and user accessible parts

Item	Part Group Name	Table Number	Description
101-108	Plastics Covers	Table 9-3 on page 9-5	Housing Covers
201-202	LCD	Table 9-4 on page 9-6	Monitor and its covers
301-323	OPIO	Table 9-6 on page 9-10	User interface parts & speaker
401-415	Nest Box	Table 9-6 on page 9-10	Main board modules Including front/back end boards
501-511	Mechanical Parts	Table 9-7 on page 9-12	Mechanical Parts
601-605	Options	Table 9-8 on page 9-14	Options and power cord
701-706	Optional Peripherals and Accessories	Table 9-9 on page 9-15	Optional Equipment
	System Manuals - Voluson® S8 / Voluson® S6	Table 9-10 on page 9-16	System Manuals
801- 811- 821-	Probes • 2D curved array Transducers • 2D linear array Transducers • Real-Time 4D Volume Probes	Table 9-12 on page 9-17 Table 9-13 on page 9-18 Table 9-14 on page 9-19	Probes
831-844	Power Cord	Table 9-15 on page 9-21	Power Cord
851-	Biopsy Needle Guides	Table 9-16 on page 9-22	Biopsy Needle Guides

Section 9-4
Plastics Covers (Front/Sides/Rear)

Figure 9-2 Plastics Covers (Front/Side/Rear)

Table 9-3 Plastics Covers

Item	Part Name	Part Number	Description	Qty	CRU	FRU
101	Side Cover R Assy	5405168	Plastics, RS probe connector Voluson® S8 / Voluson® S6	1		1
102	Side Cover L Assy	5405169	Plastic, w/ ‘cap’ for Voluson® S8 / Voluson® S6	1		1
103	Front Cover Assy	5405167	Plastic (Snap On) for Voluson® S8 / Voluson® S6	1	1	1
104	Top Cover - High Cabinet	5405174	VOLUSON silk for Voluson® S8 / Voluson® S6	1		1
105	Top Cover - Mid Cabinet	5405172	VOLUSON silk for Voluson® S8 / Voluson® S6	1		1
106	Rear Cover	5405170	Assy Plastic for Voluson® S8 / Voluson® S6	1		1
107	Side Tray & Footresst Cover	5408075	2 side trays and Foot rest plastics in one kit for Voluson® S8 / Voluson® S6	1		1
108	Dummy Cover	5408076	Plastics, BW PRT Bezel, Dummy for Mid and High Cabinets	1		1

Section 9-5
LCD Monitor

Figure 9-3 LCD Monitor

Table 9-4 LCD

Item	Part Name	Part Number	Description	Qty	CRU	FRU
201	19" LCD	5392293	19" LCD	1		1
202	19" LCD Covers	5408078	19" LCD Covers	1		1

Section 9-6
OPIO

Figure 9-4 OPIO

Table 9-5 OPIO

Item	Part Name	Part Number	Description	Qty	CRU	FRU
301	OPIO PANEL ASSY	5370998	OPIO PANEL ASSY	1		1
302	OPIO Main PWA Assy	5393434	OPIO Main PWA Assy	1		1
303	OPIO Sub PWA Assy	5393435	OPIO Sub PWA Assy	1		1
304	OPIO Hub PWA Assy	5393436	OPIO Hub PWA Assy	1		1
305	Full A/N Keyabord	5408671	AN Keyboard Assembly Polaris	1		1
306	TGC Assy	5393437	TGC Board	1		1
307	OPIO Wheel Assy	5393438	OPIO Wheel Assy	1		1
308	Trackball Assy	5393439	Trackball Assy	1		1
309	OPIO Button Sets	5408082	OPIO BUTTON SETS	1		1
310	Encoder set	5408081	ENCODER SET	1		1
311	OPIO Plastic Covers	5408079	OPIO PLASTIC COVERS	1		1
312	OPIO Top Covers	5408084	OPIO TOP COVER SET	1		1
313	Speaker Assy	5408080	SPEAKER ASSY	1		1
314	A/N KEY CAP - English	6020710	A/n Key Top with Base Assembly, English	1		1
315	A/N KEY CAP - Swedish	6020713	A/n Key Top with Base Assembly, Swedish	1		1
316	A/N KEY CAP - Norwegian	6020714	A/n Key Top with Base Assembly, Norwegian	1		1
317	A/N KEY CAP - Finish	5400764	A/n Key Top with Base Assembly, Finish	1		1
318	A/N KEY CAP - Dansih	5400762	A/n Key Top with Base Assembly, Danish	1		1
319	A/N KEY CAP - Portuguese	5400770	A/n Key Top with Base Assembly, Portuguese	1		1
320	A/N KEY CAP - Spanish	5400771	A/n Key Top with Base Assembly, Spanish	1		1
321	A/N KEY CAP - Italian	5400769	A/n Key Top with Base Assembly, Italian	1		1
322	A/N KEY CAP - German	5400768	A/n Key Top with Base Assembly, German	1		1
323	A/N KEY CAP - France	5400766	A/n Key Top with Base Assembly, French	1		1

Section 9-7
Nest Box Parts

Figure 9-5 Nest Box Parts

Figure 9-6 Nest Box Parts(Cont')

Table 9-6 Nest Box

Item	Part Name	Part Number	Description	Qty	CRU	FRU
401	PIR Assy	5366065	PIR Assy	1		1
402	BF128 Assy	5338209	BF128 Assy	1		1
403	BF64 Assy	5396937	BF64 Assy	1		1
404	RFS Assy	5364098	RFS Assy	1		1
405	SOM w/ 2GB Memory	5324556	COM Express MODULE with Intel Core 2 Duo 2.53Ghz, DDR3 2G Memory, Heatsink	1		1
406	HDD	5393432	2.5 inch HDD	1		1
407	CPS Assy	5393431	CPS Assy	1		1
408	CBP Assy	5364094	CBP ASSY	1		1
409	CSI Assy	5364095	CSI Assy	1		1
410	DVD unit	5393433	DVD Drive	1		1
411	FAN with Cable Assy	5363484	FAN with Cable Assy	1		1

Table 9-6 Nest Box

Item	Part Name	Part Number	Description	Qty	CRU	FRU
412	OPIO Cable Assy	6020400	OPIO Cable Assy	1		1
413	LCD Montior Cable Assy	6020408	Main Panel cable	1		1
414	Peripheral Cable Assy	5408182	Peripheral Cable Assy	1		1
415	AC Cable Holder	5408086	AC CABLE HOLDER SET	1		1

Section 9-8
Mechanical Parts

Figure 9-7 Mechanical Parts

Table 9-7 Mechanical Parts

Item	Part Name	Part Number	Description	Qty	CRU	FRU
501	Total Lock Caster	5400391	Total Lock Caster	3		1
502	Swivel Lock Caster	5400392	Swivel Lock Caster	1		1
503	Caster Cap Set	5408087	Caster Cap Set	1		1

Table 9-7 Mechanical Parts

Item	Part Name	Part Number	Description	Qty	CRU	FRU
504	Filter	5374942	Air filter without cables	1		1
505	Rear Handle	5374864	Rear Handle	1		1
506	Cable Duct	6020597	Elevation cable duct cover	1		1
507	LCD Arm	5400794	LCD Arm Assy (without cables)	1		1
508	LCD Arm Plastic Covers	5408089	LCD Arm Plastic Covers	1		1
509	Cable Hook	5408090	Cable Hook	1		1
510	Probe Holder set	5408085	Probe Holder set	1		1
511	RS Knob	5408077	RS Knob x 2, screw x 2	1	1	1

Section 9-9 Options

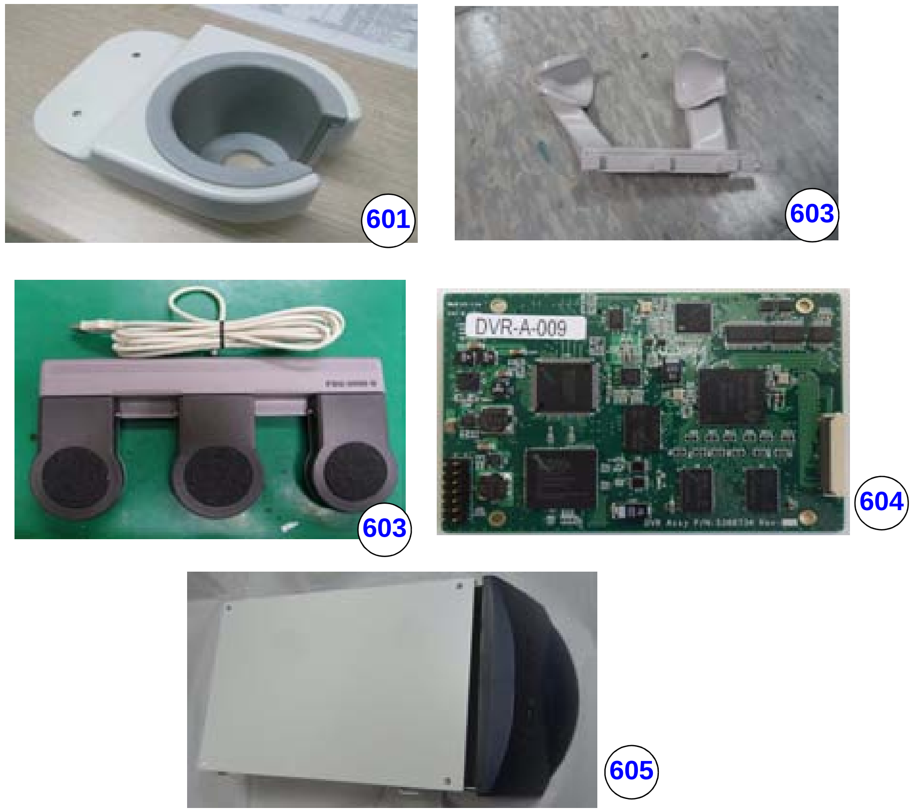


Figure 9-8

Table 9-8 Options

Item	Part Name	Part Number	Description	Qty	CRU	FRU
601	Vertical TV probe holder	5408092	Vertical TV probe holder	1		1
602	Horizontal TV probe holder	5408514	Horizontal TV probe holder	1		1
603	USB Footswitch, 3 button	5380960	3 button Foot Switch	1	1	1
604	DVR Assy	5388734	DVR Assy	1		1
605	Drawer	5405177	Drawer	1		1

Section 9-10
Optional Peripherals and Accessories

9-10-1 Printers and options

Figure 9-9 Optional Peripherals and Accessories - Printers

Table 9-9 Optional Peripherals and Accessories

Item	Part Name	Part Number	Description	Qty	CRU	FRU
701	SysDVD	5397329	Voluson S6/S8 SysDVD 11.0.X	-		1
702	B&W Printer Digital (SONY, UP-D897)	H44492LB	B&W Printer Digital (SONY, UP-D897)	-		1
703	Color Printer Digital (SPNY, UP-D25MD)	H44642LW	Color Printer Digital (SPNY, UP-D25MD)	-		1
704	Bluetooth Line Printer EU+USA	H48661MT	Bluetooth Line Printer EU+USA	-		1
705	Printer installation kit (BW and Color)	H46762LS	BW Printer bracket, Color Printer bracket, Cable set, SCREW PH W/SP M4X8, SCREW FH M3X6, SCREW FH M4X6, DUMMY CASE MID BW POLARIS	-		N
706	WLAN Stick	KTZ196269 (H48671DT)	Wireless Network Interface ("Netgear" WLAN Adapter)	-	1	1

NOTE: The illustrations may not correspond to the actual product!

Section 9-11
System Manuals

Table 9-10 System Manuals - Voluson® S8 / Voluson® S6

Part Name	Part # VS8	Part # VS6
Service Manual	H46712LK	H46712LK
System User Manuals		
Basic User Manual, English	H46742LB	H46742LB
Basic User Manual, German	H46742LC	H46742LC
Basic User Manual, Spanish	H46742LD	H46742LD
Basic User Manual, Portuguese	H46742LE	H46742LE
Basic User Manual, Italian	H46742LF	H46742LF
Basic User Manual, French	H46742LG	H46742LG
Basic User Manual, Japanese	H46742LJ	H46742LJ
Basic User Manual, Danish	H46742LK	H46742LK
Basic User Manual, Dutch	H46742LL	H46742LL
Basic User Manual, Finnish	H46742LM	H46742LM
Basic User Manual, Greek	H46742LN	H46742LN
Basic User Manual, Norwegian	H46742LP	H46742LP
Basic User Manual, Polish	H46742LR	H46742LR
Basic User Manual, Russian	H46742LS	H46742LS
Basic User Manual, Swedish	H46742LT	H46742LT
Basic User Manual, Turkish	H46742LW	H46742LW
Basic User Manual, Czech	H46742LY	H46742LY
Basic User Manual, Croatian	H46742LZ	H46742LZ
Basic User Manual, Serbian	H46752LA	H46752LA
Basic User Manual, Hungarian	H46752LB	H46752LB
Basic User Manual, Latvian	H46752LC	H46752LC
Basic User Manual, Lithuanian	H46752LD	H46752LD
Basic User Manual, Estonian	H46752LE	H46752LE
Basic User Manual, Slovakian	H46752LF	H46752LF
Basic User Manual, Bulgarian	H46752LG	H46752LG
Basic User Manual, Romanian	H46752LH	H46752LH
Basic User Manual, Korean	H46752LJ	H46752LJ
Advanced Reference Manual, English	H46752LT	H46732LT

Section 9-12
Probes

Table 9-11 below outlines the replacement parts described in the sub-sections.

Table 9-11 Probes - Replacement Parts

Sub-section	Description	Page Number
9-12-1	2D-Probes - Curved Array Transducers	9-17
9-12-2	2D-Probes - Linear Array Transducers	9-18
9-12-3	Real-Time 4D Volume Probes	9-19

9-12-1 2D-Probes - Curved Array Transducers

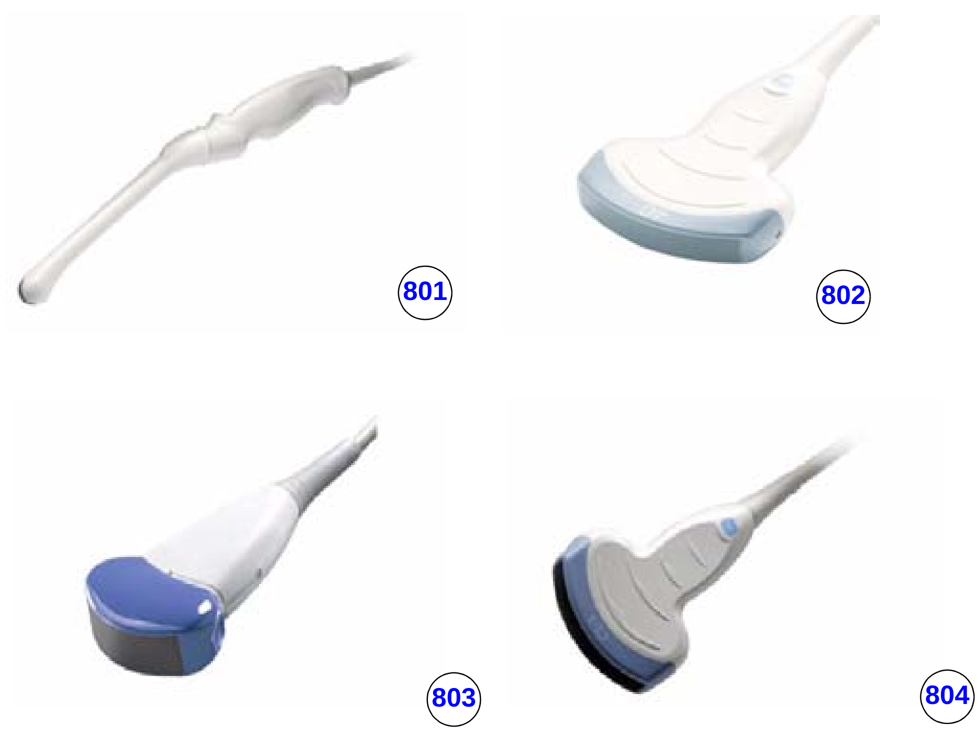


Figure 9-10 2D curved array Transducers

Table 9-12 2D curved array Transducers

Item	Part Name	Part Number	Description	Qty	CRU	FRU
801	E8C-RS	2290777	Micro Convex transducer 4.0 - 12.0 MHz, 128 Elements Applications: OB, Gyn, Fetal Cardio, Urology	-	1	1
802	4C-RS	5131629	broadband curved array transducer, 2.0 - 5.0 MHz, 128 Elements Applications: Abdominal, Obstetrics, Gynecology	-	1	1
803	AB2-7-RS	KTZ300275	broadband curved array transducer, 2.0 - 7.0 MHz, 192 Elements, Applications: Abdominal, Obstetrics, Gynecology, Urology, Pediatrics	-	1	1

Table 9-12 2D curved array Transducers

Item	Part Name	Part Number	Description	Qty	CRU	FRU
804	C1-5-RS	**5384875**	Broadband curved array transduce, 2.0 = 5.0 MHz, 192 Elements, Applications: Abdominal, Obstetrics, Gynecology.	-	1	1

9-12-2 2D-Probes - Linear Array Transducers

Figure 9-11 2D-Probes - Linear Array Transducers

Table 9-13 2D linear array Transducers

Item	Part Name	Part Number	Description	Qty	CRU	FRU
811	12L-RS	**5141337**	Small and lightweight linear-array transducer 4.0 - 10.0 MHz, 192 Elements Applications: Small parts, Peripheral vascular, Pediatrics, Orthopedics	-	1	1

9-12-3 Real-Time 4D Volume Probes

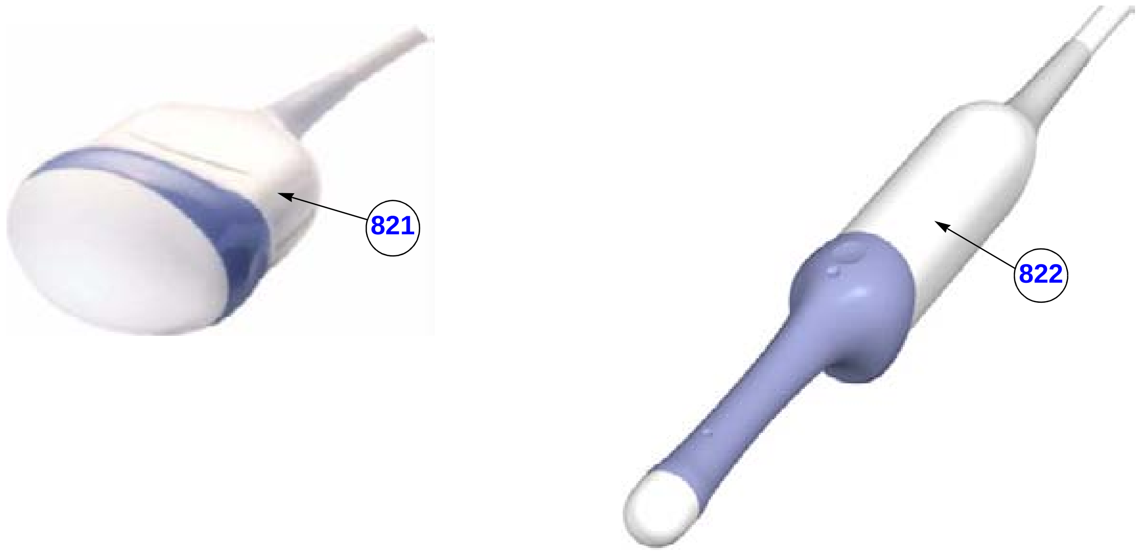


Figure 9-12 Real-Time 4D Volume Probes

Table 9-14 Real-Time 4D Volume Probes

Item	Part Name	Part Number	Description	Qty	CRU	FRU
821	RAB4-8-RS	**2051428**	Real-time 4D broadband electronic curved-array transducer 2.0 - 8.0 MHz, 192 Elements Applications: Abdominal, OB, Gyn, Pediatrics, Urology, Interventional Radiology	-	1	1
822	RIC5-9W-RS	**2401277**	Real-time 4D broadband electronic curved-array transducer 4.0 - 9.0 MHz, 192 Elements Applications: OB, Gyn, Fetal Cardio, Urology	-	1	1

Section 9-13
Power Cord

Figure 9-13 Power Cord

Table 9-15 Power Cord

Item	Part Name	Part Number	Description	Qty	CRU	FRU
831	Power Cord for India	5182611	Power Cord for India	1	1	1
832	Power Cord for Switzerland	5182235	Power Cord for Switzerland	1	1	1
833	Power Cord for UK/HK	5182816	Power Cord for UK/HK	1	1	1
834	Power Cord for ANZ	5182296	Power Cord for ANZ	1	1	1
835	Power Cord for Denmark	5182083	Power Cord for Denmark	1	1	1
836	Power Cord for Italy	5182940	Power Cord for Italy	1	1	1
837	Power Cord for Argentina	5182942	Power Cord for Argentina	1	1	1
838	Power Cord for Israel	5182453	Power Cord for Israel	1	1	1
839	Power Cord 110V for Canada/USA/JPN	2388982	Power Cord 110V for Canada/USA/JPN	1	1	1
840	Power Cord 220V for EU	2327990	Power Cord 220V for EU	1	1	1
841	Power Cord for China	2388981	Power Cord for China	1	1	1
842	Power Cord for Brazil	5399665	Power Cord for Brazil	1	1	1
843	Power Cord for South Africa	5408183	Power Cord for South Africa	1	1	1
844	Power Cord for Japan	5408490	Power Cord for Japan	1	1	1

Section 9-14
Biopsy Needle Guides

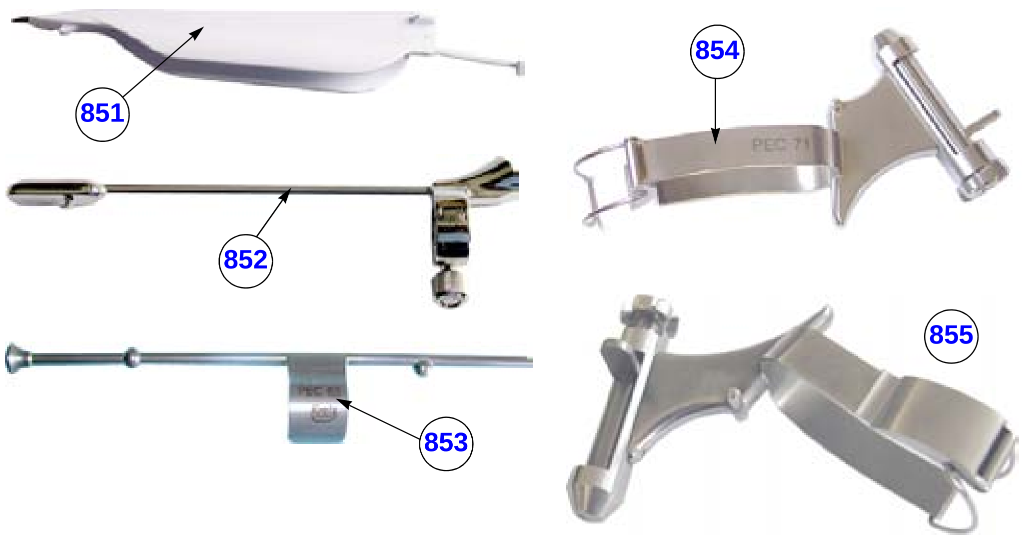


Figure 9-14 Biopsy Needle Guides

Table 9-16 Biopsy Needle Guides

Item	Part Name	Part Number	Description	Qty	CRU	FRU
851	***** (disposable)	E8385MJ	disposable Biopsy needle guide for probe **E8C-RS** needle diameter: < 1.65 mm	-	1	N
852	***** (reusable)	H40412LN	reusable Biopsy needle guide for probe **E8C-RS** needle diameter: < 1.65 mm	-	1	N
853	PEC63	(H46721R)	reusable Biopsy needle guide for probe **RIC5-9W-RS** needle diameter: < 1.8 mm	-	1	N
854	PEC71	H46721D	reusable Biopsy needle guide for probe **AB2-7-RS** needle diameter: < 1 mm, 1.4 mm, 2.2 mm	-	1	N
855	PEC83	H48671ME	reusable Biopsy needle guide for probe **AB2-7-RS** needle diameter: < 1 mm, 1.4 mm, 2.2 mm	-	1	N

Section 9-14 Biopsy Needle Guides (cont'd)

Figure 9-15 Biopsy Needle Guides

Table 9-17 Biopsy Needle Guides

Item	Part Name	Part Number	Description	Qty	CRU	FRU
861	PEC74	(H48621Y)	reusable Biopsy needle guide for probe **RAB4-8-RS, RAB2-5-RS** needle diameter: < 1 mm, 1.4 mm, 2.2 mm	-	1	N
862	RAB Single-angle bracket	(H46701AE)	Non Sterile Single Angle Bracket needle guide for probe **E8C-RS, RAB2-5-RS** needle diameter: > 0.6 mm - < 2.1 mm	-	1	N
863	PEC78	(H46721W)	reusable Biopsy needle guide for probe **RAB4-8-RS** needle diameter: < 1 mm, 1.4 mm, 2.2 mm	-	1	N

Section 9-14 Biopsy Needle Guides (cont'd)

Figure 9-16 Biopsy Needle Guides

Table 9-18 Biopsy Needle Guides

Item	Part Name	Part Number	Description	Qty	CRU	FRU
871	C1-5-RS Biopsy guide	H40432LE	Non Sterile Multi Angle Bracket needle guide for probe **C1-5-RS / 4C-RS** needle diameter: > 0.6 mm - < 2.1 mm	-	1	N
872	12L-RS Multi-angle bracket	H40432LC	Non Sterile Multi Angle Bracket needle guide for probe **12L-RS** needle diameter: > 0.6 mm - < 2.1 mm	-	1	N

Chapter 10
Care & Maintenance

Section 10-1
Overview

10-1-1 Periodic Maintenance Inspections

It has been determined by engineering that your Voluson® S8 / Voluson® S6 system does not have any high wear components that fail with use, therefore no Periodic Maintenance Inspections are mandatory. However, some Customers Quality Assurance Programs may require additional tasks and/or inspections at a different frequency than listed in this manual.

10-1-2 Purpose of Chapter 10

This chapter describes **Care & Maintenance** on the Voluson® S8 / Voluson® S6 system and its peripherals.
These procedures are intended to **maintain the quality** of the ultrasound **systems performance**. Read this chapter completely and familiarize yourself with the procedures before performing a task.

Table 10-1 Contents in Chapter 10

CAUTION **Practice good ESD prevention. Wear an anti–static strap when handling electronic parts and even when disconnecting/connecting cables.**

DANGER **THERE ARE SEVERAL PLACES ON THE BACKPLANE, THE AC DISTRIBUTION, AND DC DISTRIBUTION THAT ARE DANGEROUS. BE SURE TO DISCONNECT THE SYSTEM POWER PLUG AND SWITCH OFF THE MAIN CIRCUIT BREAKER BEFORE YOU REMOVE ANY PARTS. BE CAUTIOUS WHENEVER POWER IS STILL ON AND COVERS ARE REMOVED.**

CAUTION **Do not pull out or insert circuit boards while power is ON.**

CAUTION **DO NOT operate this unit unless all board covers and frame panels are securely in place, to ensure optimal system performance and cooling.**
When covers are removed, EMI may be present.

Section 10-2
Why do Maintenance

10-2-1 Keeping Records

It is good business practice that ultrasound facilities maintain records of quality checks and corrective maintenance. The Ultrasound Inspection Certificate (see: page 10-24) provides the customer with documentation that the ultrasound scanner is maintained on a periodic basis.

A copy of the Ultrasound Inspection Certificate should be kept in the same room or near the scanner.

10-2-2 Quality Assurance

In order to gain accreditation from organizations such as the American College of Radiology (USA), it is the customer's responsibility to have a quality assurance program in place for each scanner.
The program must be directed by a medical physicists, the supervising radiologist/physician or appropriate designer.

Routine quality control testing must occur regularly. The same tests are performed during each period so that changes can be monitored over time and effective corrective action can be taken.

Testing results, corrective action and the effects of corrective action must be documented and maintained on the site.

Your GE service representative can help you with establishing, performing and maintaining records for a quality assurance program. Please contact us for coverage information and/or price for service.

Section 10-3
Maintenance Task Schedule

10-3-1 How often should care & maintenance tasks be performed?

The Customer Care Schedule (see: page 10-3) specifies how often your Voluson® S8 / Voluson® S6 should be serviced and outlines items requiring special attention.

NOTE: It is the customer's responsibility to ensure the Voluson® S8 / Voluson® S6 care & maintenance is performed as scheduled in order to retain its high level of safety, dependability and performance.

Your GE Service Representative has an in-depth knowlegde of your Voluson® S8 / Voluson® S6 ultrasound scanning system and can best provide competent, efficient service.
Please contact us for coverage information and/or price for service.

The service procedures and recommended intervals shown in the Customer Care Schedule assumes that you use your Voluson® S8 / Voluson® S6 for an average patient load (10-12 per day) and not use it as a primary mobile unit which is transported between diagnostic facilities.

NOTE: If conditions exist which exceed typical usage and patient load, then it is recommended to increase the maintenance frequencies.

Abbreviations used in the Customer Care Schedule Table 10-2:

D = Daily W = Weekly M = Monthly A = Annually

10-3-1 How often should care & maintenance tasks be performed? (cont'd)

Table 10-2 Customer Care Schedule

Item	Service at Indicated Time	D	W	M	A	Notes
Air Filter Grid	Remove the filter grid and clean the air filter grid with vacuum cleaner from outside.			•		more frequently depending on your environment
Air Filter Grid	Remove filter grid, back top cover and back cover and clean the housing from inside. (vacuum cleaner and soft brush)				•	more frequently depending on your environment
AC Mains Cable	Inspect AC Mains Cable			•		Mobile Unit Check weekly
Cables and Connectors	Check if all cables are fixed well seated at the correct position and if there is no mechanical damage visible.				•	also after corrective maintenance
User Interface	Clean alphanumerical keyboard, Functional keys, Digital potentiometers, TGC-Shift potentiometers. (vacuum cleaner, lukewarm soap water on a soft, damp cloth)		•			Be careful not to get the cloth too wet so that moisture does not enter the loudspeakers, TGC-Slider, or other keys!
LCD Monitor and Probe holder	Clean LCD Monitor surface and Probe holder with a fluid detergent in warm water on a soft, damp cloth.		•			Be careful not to get the cloth too wet so that moisture does not enter the entire system.
Mechanical parts	Clean and inspect the mechanical function of wheels, casters, brakes and swivel locks as well as side door, foot rest, front and rear handle, and monitor holder. Remove Dust and Coupling gel.			•		Mobile Unit Check Daily
Control Console movement	Check Translation/Rotation and Height Adjustment (Elevation)				•	more frequently at Mobile Units
Trackball Check	Check proper operation (Cursor movement X, Y direction)	•				If failure occurs go to trackball cleaning.
Trackball Cleaning	Remove trackball ring; open the trackball housing and take out the trackball to clean it with soft tissue and screwdriver shaft.				•	Please record it in the systems setup maintenance report
Disk Drives (Data Backup)	Test Image filing (Archive) Import and Export data capability (DVD/CD Drive)		•	•*		* save the image filing data weekly or at least monthly on DVD/CD depending on the number of examinations
Safe Probe Operation	Clean probes and probe cables and check acoustic lens housing (cracks) and probe cables. In case of mechanical damage, don't use them! **Danger:** Safety risk for operator and patient.	•*				* or before each use
Probe Air bubbles	To detect air bubbles in filling liquid, shake the probe carefully and check abnormal noise.					
Probe connectors	Remove dust/dirt of all probe connectors. Clean with vacuum cleaner if dust is visible.			•		
Console Leakage Current Checks					•	Also after corrective maintenance or as required by your facilities QA program.

Table 10-2 Customer Care Schedule

Item	Service at Indicated Time	D	W	M	A	Notes
Peripheral Leakage Current Checks					•	Also after corrective maintenance or as required by your facilities QA program.
Surface Probe Leakage Current Checks					•	Also after corrective maintenance or as required by your facilities QA program.
Endocavity Probe Leakage Current Checks					•	Also after corrective maintenance or as required by your facilities QA program.
Measurement Accuracy Checks					•	Also after corrective maintenance or as required by your facilities QA program.
Probe/ Phantom(optional) Checks	Check axial and lateral resolution (see Basic User Manual Technical specifications). Check Gain and TGC changes, vary the focus and check reaction on screen.				•	Also after corrective maintenance or as required by your facilities QA program.
Functional Checks of all probes Section 10-5-2 on page 10-7					•	Also after corrective maintenance or as required by your facilities QA program.

Section 10-4
Tools Required

10-4-1 Special Tools, Supplies and Equipment

10-4-1-1 Specific Requirements for Care & Maintenance

Table 10-3 Overview of Requirements for Care & Maintenance

Tool	Part Number	Comments
Digital Volt Meter (DVM)		minimum 5% accuracy, 3.5 digit and 200 Ohm range required
Anti Static Kit	46–194427P231 46–194427P279 46–194427P369 46–194427P373 46–194427P370	Kit includes anti–static mat, wrist strap and cables for 200 to 240 V system 3M #2204 Large adjustable wrist strap 3M #2214 Small adjustable wrist strap 3M #3051 conductive ground cord
Anti Static Vacuum Cleaner	46–194427P278 46–194427P279	120V 230V
Safety Analyzer	46–285652G1	DALE 600 KIT (or equivalent) for electrical tests
QIQ Phantom(Optional)	E8370RB	RMI Grayscale Target Model 403GS
CD-RW Media		(minimum quad speed)
DVD+RW Disc Media blank	H48641D	blank 4,7GB DVD+RW disc
B/W Printer Cleaning Sheet		see printer user manual for requirements
Color Printer Cleaning Sheet		see printer user manual for requirements
Disposable Gloves		
Screwdriver PH0		
Screwdriver PH1		
Screwdriver PH2		

Section 10-5
System Maintenance

10-5-1 Preliminary Checks

The preliminary checks take about 15 minutes to perform. Refer to the system user documentation whenever necessary.

Table 10-4 System Checks

Step	Item	Description
1	Ask & Listen	Ask the customer if they have any problems or questions about the equipment.
2	Paperwork	Fill in the top of the Ultrasound Inspection Certificate (see: page 10-24). Note all probes and system options.
3	Power up	Turn the system power on and verify that all fans and peripherals turn on. Watch the displays during power up to verify that no warning or error messages are displayed.
4	Probes	Verify that the system properly recognizes all probes.
5	Displays	Verify proper display on the LCD monitor.
6	Presets	“Full Backup” all customer presets on Hard disk and/or DVD (see: Section 4-5-3 "Save Full System Configuration (Full Backup)" on page 4-42).
7	Image Archive	Backup the Image Archive on DVD, USB-Stick, etc. (see: Section 4-5-6-1 "Save Image Archive" on page 4-47).

10-5-2 Functional Checks

The functional checks take about 60 minutes to perform.
Refer to the Voluson® S8 / Voluson® S6 Basic User Manual whenever necessary.

10-5-2-1 System Checks

Table 10-5 System Functional Checks

Step	Item	Description
1	B Mode	Verify basic B Mode (2D) operation. Check the basic system controls that affect this mode of operation.
2	M Mode	Verify basic M Mode operation. Check the basic system controls that affect this mode of operation.
3	C Mode	Verify basic CFM Mode (Color Flow Mode) operation. Check the basic system controls that affect this mode of operation.
4	PD Mode	Verify basic PD Mode (Power Doppler Mode) operation. Check the basic system controls that affect this mode of operation.
5	Doppler Modes	Verify basic Doppler Mode operation (PW). Check the basic system controls that affect this mode of operation.
6	3D Mode	Verify basic 3D Mode operation. Check the basic system controls that affect this mode of operation.
7	RealTime 4D Mode (optional)	Verify basic RealTime 4D Mode operation. Check the basic system controls that affect this mode of operation.
8	*Applicable Software Options	Verify the basic operation of all optional modes. Check the basic system controls that affect each options operation.
9	Keyboard Test	Perform the Keyboard Test Procedure to verify that all keyboard controls are OK.
10	LCD Monitor	Verify basic LCD Monitor display functions.
11	Measurements	Scan a gray scale phantom(optional) and use the measurement controls to verify distance and area calculation accuracy. Refer to the Basic User Manual, for measurement accuracy specifications.

NOTE: ** Some software may be considered standard depending upon system configuration.*

10-5-2-2 Peripheral/Option Checks

If any peripherals or options are not part of the system configuration, the check can be omitted. Refer to Table 3-8, “Approved Peripherals,” on page 3-49 for a list of approved peripherals.

Table 10-6 Approved Peripheral/Hardware Option Functional Checks

Step	Item	Description
1	B/W Printer	Verify hardcopy output of the B/W video page printer. Clean heads and covers if necessary.
2	Color Printer	Verify hardcopy output of the Color video page printer. Clean heads and covers if necessary.
3	Color Deskjet (Bluetooth) Printer	Verify hardcopy output of the Deskjet (Bluetooth) printer. Clean heads and covers if necessary.
4	DVR	Verify record/playback capabilities of the DVR.
5	DVD Recorder	Verify record capabilities of the DVD Recorder. Clean heads and covers if necessary.
6	DICOM	Verify that DICOM is functioning properly. Send an image to a DICOM device.
7	Footswitch	Verify that the footswitch is functioning as programed. Clean as necessary.
8	DVD-Drive	Verify that the DVD-drive reads/writes properly (export/recall image in Image Management System = Archive)

10-5-3 Input Power

10-5-3-1 Mains Cable Inspection

Table 10-7 Mains Cable Inspection

Step	Item	Description
1	Unplug Cord	Disconnect the mains cable from the wall and system.
2	Inspect	Inspect it and its connectors for damage of any kind.
3	Terminals	Verify that the LINE, NEUTRAL and GROUND wires are properly attached to the terminals, and that no strands may cause a short circuit.
4	Inlet Connector	Inlet connector retainer is functional.

10-5-4 Cleaning

10-5-4-1 General Cleaning

Frequent and diligent cleaning of the Voluson® S8 / Voluson® S6 ultrasound system reduces the risk of spreading infection from person to person, and also helps to maintain a clean work environment.

Table 10-8 General Cleaning

Step	Item	Description
1	Console	Use a fluid detergent in warm water on a soft, damp cloth to carefully wipe the entire system. Be careful not to get the cloth too wet so that moisture does not enter the console. **Caution:** DO NOT allow any liquid to drip or seep into the system.
2	LCD Monitor	Clean LCD Monitor surface with a fluid detergent in warm water on a soft, damp cloth. **Caution:** DO NOT spray any liquid directly onto the Voluson® S8 / Voluson® S6 covers, LCD Monitor, keyboard, etc.

10-5-5 Physical Inspection

Table 10-9 Physical Checks

Step	Item	Description
1	Labeling	Verify that all system labeling is present and in readable condition.
2	Scratches & Dents	Inspect the console for dents, scratches or cracks.
3	LCD Monitor Display	Inspect the LCD Monitor Display for scratches and raster burns. Verify proper operation of Contrast and Brightness controls.
4	Control Panel and Keyboard	Inspect the Control Panel and Keyboard. Note any damaged or missing items. (Replace faulty components, as required). Verify proper operation of Control Panel backlighting and TGC sliders.
5	DVD+R/RW Drive	Clean the drive head and media with the vendor-supplied cleaning kit.Advise the user to repeat this often, to prevent future problems. DVDs/CDs must be stored away from dust and cigarette smoke. Do not use alcohol or benzene to clean the drive
6	Wheels & Brakes	Check all wheels and casters for wear and verify operation of foot brake, to stop the unit from moving, and release mechanism. Check all wheel locks and swivel locks for proper operation.
7	Cables & Connectors	Check all internal cable harnesses and connectors for wear and secure connector seating. Pay special attention to footswitch assembly and probe strain or bend reliefs.
8	Power Cord	Check the power cord for cuts, loose hardware, tire marks, exposed insulation or other deterioration, and verify continuity. Tighten the clamps that secure the power cord to the unit and the outlet plug to the cord.
9	Shielding & Covers	Check to ensure that all EMI shielding, internal covers, air flow panels and screws are in place. Missing covers and hardware could cause EMI/RFI problems during scanning.
10	Peripherals	Check and clean the peripherals according to the manufacturer's directions. To prevent EMI or system overheating, dress the peripheral cables inside the peripheral cover.
11	External I/O	Check all connectors for damage and verify that the labeling is good.
12	Op Panel Lights	Check proper operation of all control panel key illuminations (flash once during system start-up).

10-5-6 Optional Diagnostic Checks

Optionally you can access the diagnostic software as described in Chapters 5 or 7.
View the error logs and run desired diagnostics.

10-5-7 Probe Maintenance

10-5-7-1 Probe Related Checks

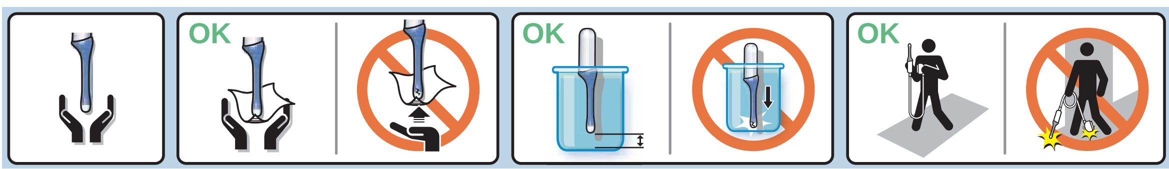
Table 10-10 Probe Related Checks

Step	Item	Description
1	Probes	Thoroughly check the system probe connectors and remove dust from inside the connector sockets if necessary. Visually check for bent, damaged or missing pins.
2	Probe Holder	Clean probe holders (they may need to be soaked to remove excess gel).

10-5-7-2 Basic Probe Care

The Basic User Manual and/or care card provides a complete description of probe care, maintenance, cleaning and disinfection. Ensure that you are completely familiar with the proper care of GE probes.

Ultrasound probes can be easily damaged by improper handling. Review the Basic User Manual of Voluson® S8 / Voluson® S6 for more details. Failure to follow these precautions can result in serious injury and equipment damage. Failure to properly handle or maintain a probe may also void its warranty.



Any evidence of wear indicates the probe cannot be used.

Do a visual check of the probe pins and system sockets before plugging in a probe.

10-5-7-3 Basic Probe Cleaning and/or Disinfection

Refer to the Basic User Manual of Voluson® S8 / Voluson® S6 for details on cleaning.

CAUTION **Failure to follow the prescribed cleaning or disinfection procedures will void the probe's warranty. DO NOT soak or wipe the lens with any product not listed in the Voluson® S8 / Voluson® S6 Basic User Manual and/or care card. Doing so could result in irreparable damage to the probe and/or Voluson® S8 / Voluson® S6 system.**

CAUTION **Follow the Care Card instructions supplied with each probe (inside the transducer boxes) for disinfectants and gels that are compatible with the surface material of the probes.**

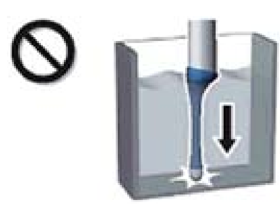
CAUTION **To help protect yourself from blood borne diseases, when cleaning and handling probes, wear approved, non-allergenic disposable gloves.**

NOTICE Disinfect a defective probe before you return it. Be sure to tag the probe as being disinfected.

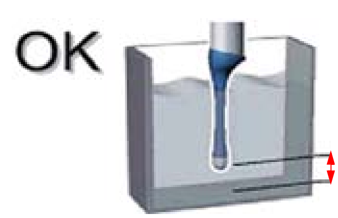
CAUTION

Please be aware of the sensitive probe head.

TAKE EXTREME CARE!



NEVER place or store a probe on its scan head!



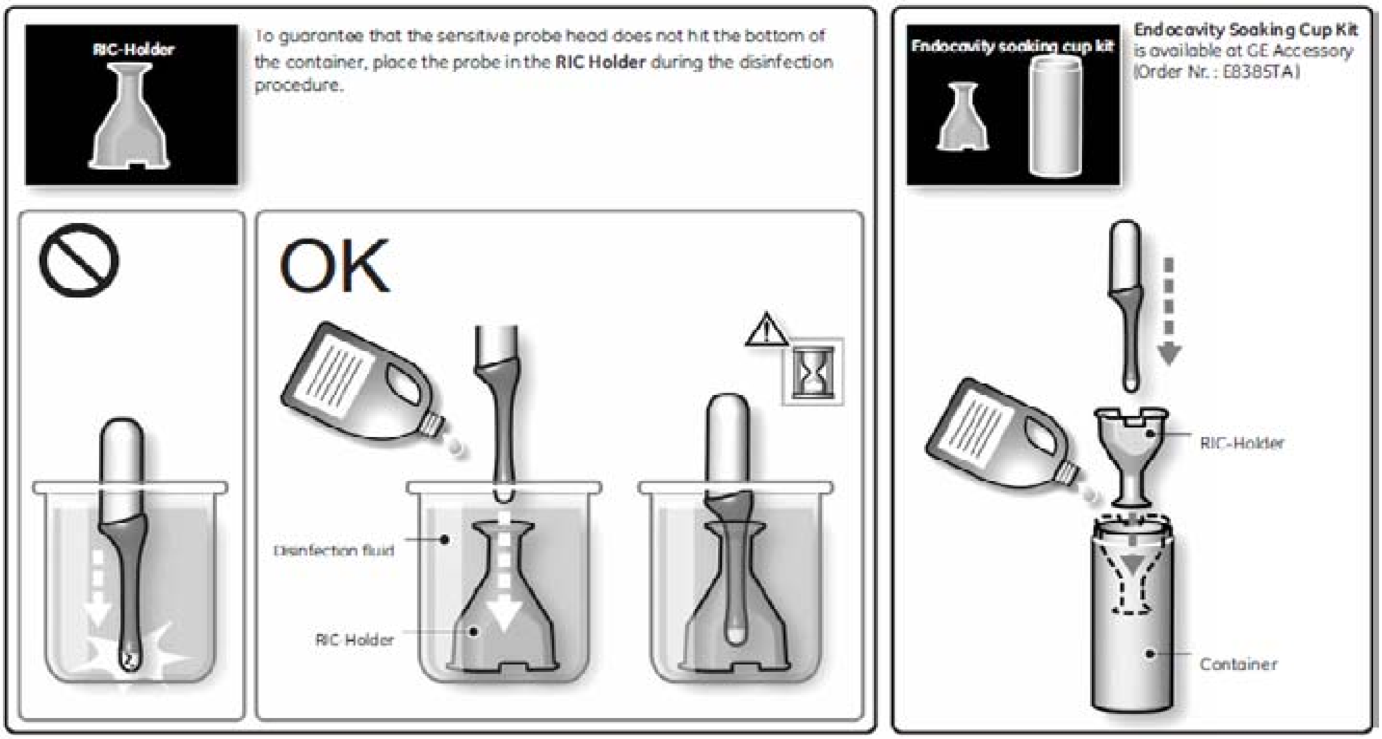
When disinfecting a probe, ensure that there is sufficient space between the probe and the

10-5-7-4 Disinfection by means of the RIC-Holder

Especially for Real-time 4D endocavity probes (RIC), it is necessary to take extreme care when transporting the system with the probe attached, or during the disinfection process.
Inadequate handling may lead to dead elements, shocked head mechanics, etc.

The RIC-Holder (especially developed for RIC Real-time 4D endocavity probes) guarantees that the sensitive probe head does not hit the bottom of the container during the disinfection procedure.

NOTE: Operation instructions are supplied with each RIC-Holder (KTZ225469).



Section 10-6
Using a Phantom (Optional)

The use of a Phantom is not required during Preventiv maintenance. Customer may use it as part of their Quality Assurance Program tests.

Section 10-7
Electrical Safety Tests

10-7-1 Safety Test Overview

The electrical safety tests in this section are based on and conform to IEC60601-1 standard including national deviations. They are intended for the electrical safety evaluation of cord-connected, electrically operated, patient care equipment. If additional information is needed, refer to IEC 60601-1 documents including national deviations.

WARNING ***THE USER MUST ENSURE THAT THE SAFETY INSPECTIONS ARE PERFORMED AT LEAST EVERY 12 MONTHS ACCORDING TO THE REQUIREMENTS OF THE PATIENT SAFETY STANDARD IEC60601-1 standard including national deviations. ONLY TRAINED PERSONS ARE ALLOWED TO PERFORM THE SAFETY INSPECTIONS MENTIONED ABOVE.***

CAUTION **To avoid electrical shock, the unit under test must not be connected to other electrical equipment. Remove all interconnecting cables and wires. The unit under test must not be contacted by users or patients while performing these tests.**

CAUTION **Possible risk of infection. Do not handle soiled or contaminated probes and other components that have been in patient contact. Follow appropriate cleaning and disinfecting procedures before handling the equipment.**

WARNING ***Test the Voluson® S8 / Voluson® S6 system, peripherals and probes for leakage current.***
Excessive leakage current can cause FATAL INJURY OR DEATH.
High leakage current can also indicate degradation of insulation and a potential for electrical failure. DO NOT use probes or equipment having excessive leakage current.

CAUTION **Compare all safety-test results with safety-test results of previously performed safety tests e.g. last year etc. In case of unexplainable abrupt changes of safety-test results consult experienced authorized service personnel or GE for further analysis.**

To minimize the risk of a probe causing electrical shock, the customer should observe the following recommendations:

- DO NOT use a probe that is cracked or damaged in any way
- Check probe leakage current:
    * once a year on surface probes
    * once a year on endocavitary probes
    * whenever probe damage is suspected

10-7-2 GEHC Leakage Current Limits for Voluson® S8 / Voluson® S6

The following limits are summarized for IEC60601-1 standard including national deviations and IEC 62353 Medical Electrical Equipment - Recurrent test and test after repair of medical electrical equipment.
Measurement limits per IEC60601-1 standard including national deviations.

Table 10-11 Enclosure Leakage Current Limits -Accessible Surfaces not protectively earthed

Conditions	Country	
	USA	Others
Close Protective earth and close neutral with normal polarity	0.1 mA*	0.1 mA***
Close Protective earth and close neutral with reverse polarity	0.1 mA*	0.1 mA***
Open Protective earth and close neutral with normal polarity	0.3 mA**	0.5 mA***
Open Protective earth and close neutral with reverse polarity	0.3 mA**	0.5 mA***
Open neutral and close Protective earth with normal polarity	0.5 mA*	0.5 mA***
Open neutral and close Protective earth with reverse polarity	0.5 mA*	0.5 mA***

Table 10-12 Earth Leakage Current Limits

Conditions	Country	
	USA	Others
Close Protective earth and close neutral with normal polarity	0.3 mA**	0.5 mA***
Close Protective earth and close neutral with reverse polarity	0.3 mA**	0.5 mA***
Open neutral and close Protective earth with normal polarity	1 mA*	1 mA***
Open neutral and close Protective earth with reverse polarity	1 mA*	1 mA***

Table 10-13 Type CF Patient Leakage Limits - Non-Conductive Surface

Conditions	Country	
	USA	Others
Close Protective earth and close neutral with normal polarity	0.1 mA*	0.1 mA***
Close Protective earth and close neutral with reverse polarity	0.1 mA*	0.1 mA***
Open Protective earth and close neutral with normal polarity	0.5 mA*	0.5 mA***
Open Protective earth and close neutral with reverse polarity	0.5 mA*	0.5 mA***
Open neutral and close Protective earth with normal polarity	0.5 mA*	0.5 mA***
Open neutral and close Protective earth with reverse polarity	0.5 mA*	0.5 mA***

Table 10-14 Type BF Patient Auxiliary Limits

Conditions	Country	
	USA	Others
Close Protective earth and close neutral with normal polarity	0.01 mA*	0.01 mA***
Close Protective earth and close neutral with reverse polarity	0.01 mA*	0.01 mA***
Open Protective earth and close neutral with normal polarity	0.05 mA*	0.05 mA***
Open Protective earth and close neutral with reverse polarity	0.05 mA*	0.05 mA***
Open neutral and close Protective earth with normal polarity	0.05 mA*	0.05 mA***
Open neutral and close Protective earth with reverse polarity	0.05 mA*	0.05 mA***

Table 10-15 Isolation between Mains and Applied Limits**- Patient Leakage Main to Type BF Applied part**

Conditions	Country	
	USA	Others
Close Protective earth and close neutral with normal polarity	5 mA*	5 mA***
Close Protective earth and close neutral with reverse polarity	5 mA*	5 mA***

NOTE: ** Measurement limits per UL 60601-1 Medical Electrical Equipment Safety Standards Table IV*
***Most meters (like Dale 600/601) only measure AC (rms).*

***Measurement limits per UL 60601-1 Medical Electrical Equipment Safety Standards, Table 19.5DV.1*

****Measurement limits per IEC 60601-1 Medical Electrical Equipment Safety Standards, Table IV*

***** Isolation between Mains and Applied Limits refers to the measurement of leakage current flow which would flow from mains to patient if the patient were to come into contact with mains voltage.*

The following tests are performed at the factory and should be performed at the customer site as well.

- Grounding Continuity
- Earth Leakage Current
- Enclosure Leakage Current
- Patient Leakage Current

All measurements should be made with an electrical safety analyzer.

10-7-3 Outlet Test - Wiring Arrangement - USA & Canada

Test all outlets in the area for proper grounding and wiring arrangement by plugging in the neon outlet tester and noting the combination of lights that are illuminated. Any problems found should be reported to the hospital immediately and the receptacle should not be used.

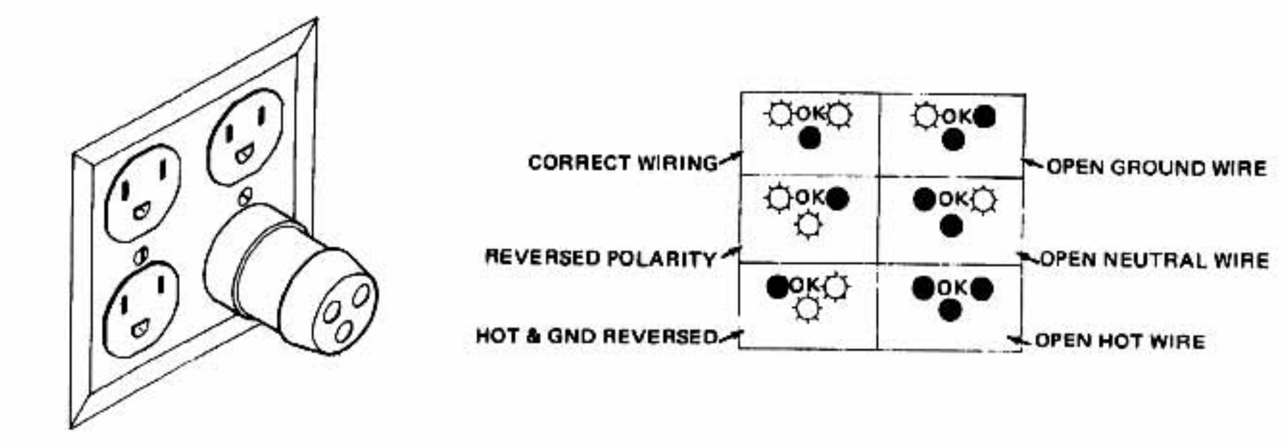


Figure 10-1 Typical Outlet Tester

NOTE: No outlet tester can detect the condition where the Neutral (grounded supply) conductor and the Grounding (protective earth) conductor are reversed. If later tests indicate high leakage currents, this should be suspected as a possible cause and the outlet wiring should be visually inspected.

10-7-4 Grounding Continuity

CAUTION **Electric Shock Hazard!**
The patient or operator MUST NOT come into contact with the equipment during this test

Measure the resistance from the third pin of the attachment plug to the exposed protectively-earthed metal parts of the case. The ground wire resistance should be less than **0.2** ohms.
Reference the procedure in the IEC60601-1-1.

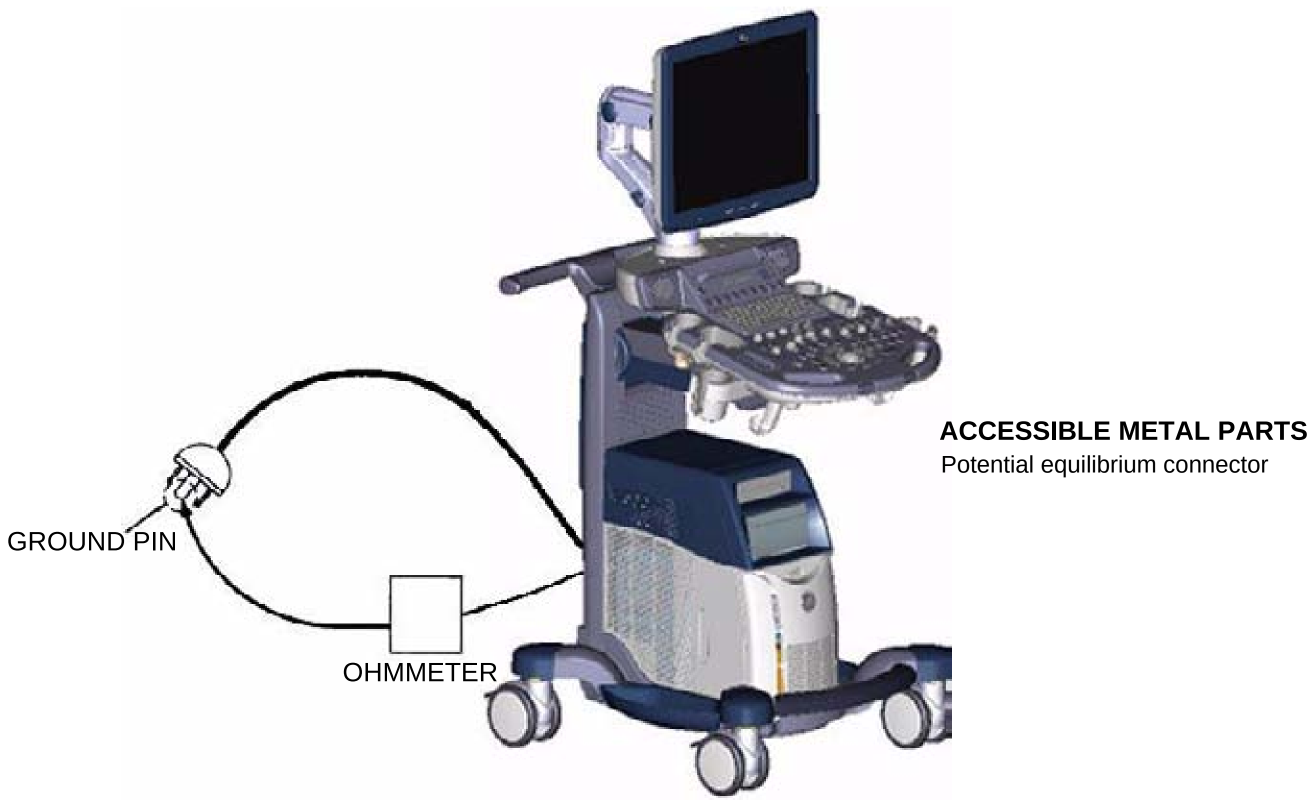


Figure 10-2 Ground Continuity Test

CAUTION **Lacquer is an isolation barrier! Resistor may be high-impedance!**
Measure only on blank parts, stated in Figure 10-2 above.

10-7-4-1 Meter Procedure

Follow these steps to test the Ground wire resistance.

1.) Turn the Voluson® S8 / Voluson® S6 unit OFF.
2.) Plug the unit into the meter, and the meter into the tested AC wall outlet.
3.) Plug the black chassis cable into the meter's "CHASSIS" connector and attach the black chassis cable clamp to an exposed protectively earthed metal part of the Voluson® S8 / Voluson® S6 unit such as Potential equilibrium connector.
4.) Set the meter's “FUNCTION” switch to the RESISTANCE position.
5.) Set the meter's “POLARITY” switch to the OFF (center) position.
6.) Measure and record the Ground wire resistance.
This should be less than 0.2 Ohms.

10-7-5 Enclosure Leakage Current Test

10-7-5-1 Definition

This test measures the current that would flow in a grounded person who touched accessible non-protectively-earthed parts of equipment if the ground wire were to break. The test verifies the isolation of the power line from the chassis.

The meter is connected from accessible non-protectively-earthed parts of the case to ground. Measurements should be made with the ground open and closed, with power line polarity normal and reversed, and with the neutral open and closed. Record the highest reading.

DANGER **Electric Shock Hazard.**

When the meter's ground switch is OPEN, DO NOT not touch the unit!

CAUTION **Equipment damage possibility. Never switch the Polarity and the status of Neutral when the unit is powered ON. Be sure to turn the unit power OFF before switching them using the POLARITY switch and/or the NEUTRAL switch. Otherwise, the unit may be damaged.**

10-7-5-2 Generic Procedure

The test verifies the isolation of the power line from the enclosure. The testing meter is connected from accessible non-protectively-earthed parts of the case to ground. Measurements should be made with the ground open and closed, with power line polarity normal and reversed, and with the neutral open and closed. Record the highest reading of current.

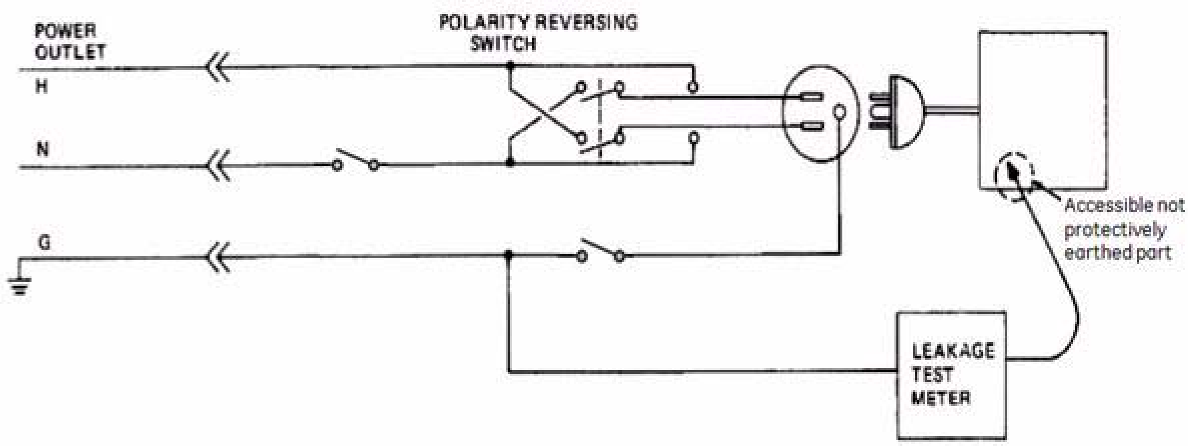


Figure 10-3 Set Up for Test of Enclosure Leakage Current, IEC 60601-1 Clause 19

NOTE: Color of Power outlet cable

i)USA and Canada

Hot : Black

Neutral : White

Ground : Green or Green-yellow

ii)Others

Hot : Brown

Neutral : Blue

Ground : Green-yellow

When using Dale 600/601 or a similar test instrument, its power plug may be inserted into the wall outlet and the equipment under test is plugged into the receptacle on the panel of the meter. This places the meter in the grounding conductor and the current flowing from the case to ground will be indicated in any of the current ranges. The maximum allowable limit for chassis source leakage is shown in Table 10-11 on page 10-13.

10-7-5-3 Data Sheet for Enclosure Leakage Current

The test passes when all readings measure less than the value shown in Table 10-11. Record all data on the Ultrasound Inspection Certificate.

Table 10-16 Typical Data Sheet for Enclosure Leakage Current

Tester Neutral	Tester Polarity Switch	Protective Earth Switch	Test 1 Wheel	Test 2 LCD	Optional Test 3	Optional Test 4
Enter Name of tested peripheral here:						
Closed	Normal	Closed				
Closed	Normal	Open				
Closed	Reversed	Closed				
Closed	Reversed	Open				
Open	Normal	Closed				
Open	Reversed	Closed				

10-7-6 Earth Leakage Current Test

10-7-6-1 Definition

This test measures the current that would flow to a grounded person who touched accessible protectively-earthed parts of equipment if the ground wire should break.

The meter is connected from accessible protectively-earthed parts of the equipment to ground. Measurements should be made with power line polarity normal and reversed, and with the neutral open and closed Record the highest reading.

CAUTION **Equipment damage possibility, Never switch the Polarity and the status of Neutral when the unit is powered ON. Be sure to turn the unit power OFF before switching them using the POLARITY switch and/or the NEUTRAL switch. Otherwise, the unit may be damaged.**

10-7-6-2 Generic Procedure

The testing meter is connected from accessible protectively-earthed parts of the equipment to ground. Measurements should be made with power line polarity normal and reversed, and with the neutral open and closed. Record the highest reading of current.

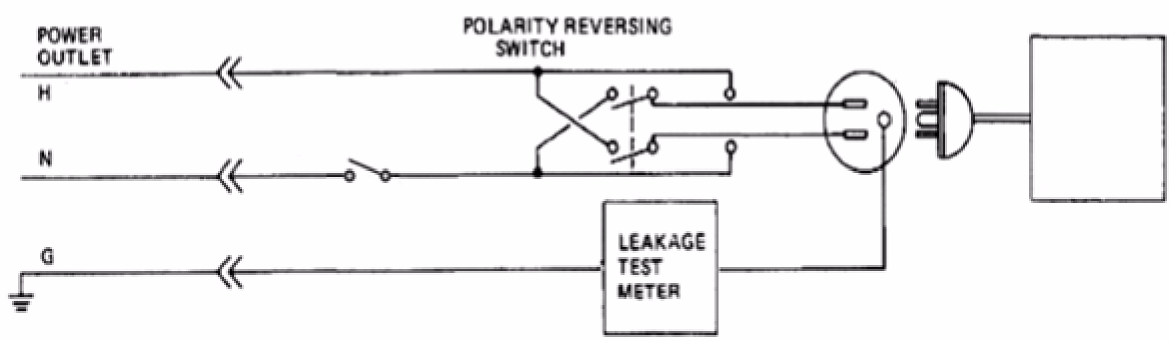


Figure 10-4 Set Up for Test of Earth Leakage Current, IEC 60601-1 Clause 19

NOTE: Color of Power coutlet cable

i) USA and Canada

Hot : Black

Neutral : White

Ground : Green or Green-yellow

ii) Others

Hot : Brown

Neutral : Blue

Ground : Green-yellow

When using Dale 600/601 or a similar test instrument, its power plug may be inserted into the wall outlet and the equipment under test is plugged into the receptacle on the panel of the meter. This places the meter in the grounding conductor and the current flowing through protective earth will be indicated in any of the current ranges. The maximum allowable limit for earth leakage current is shown in Table 10-12 on page 10-13.

Table 10-17 Typical Data Sheet for Earth Leakage Currents

Tester Neutral	Tester Polarity Switch	Measured Earth Leakage Current
Enter Name of tested peripheral here		
Closed	Normal	
Closed	Reversed	
Open	Normal	
Open	Reversed	

10-7-7 Type CF Patient Leakage Current Test - ECG Leads

10-7-7-1 Definition

This test measures the current that would flow to ground from any of the probes through a patient who is being scanned and becomes grounded by touching some other grounded surface.

NOTE: *Some leakage current is expected on each probe, depending on its design. Small variations in probe leakage currents are normal from probe to probe. Other variations will result from differences in line voltage and test lead placement. It is abnormal if no leakage current is measured. If no leakage current is detected, check the configuration of the test equipment.*

CAUTION **Equipment damage possibility. Never switch the Polarity and the status of Neutral when the unit is powered ON. Be sure to turn the unit power OFF before switching them using the POLARITY switch and/or the NEUTRAL switch. Otherwise, the unit may be damaged.**

10-7-7-2 Generic Procedure on Leakage Current

Measurements should be made with the ground open and closed, with power line polarity normal and reversed, and with neutral open and closed.

For each combination, the probe must be active to find the worst case condition.

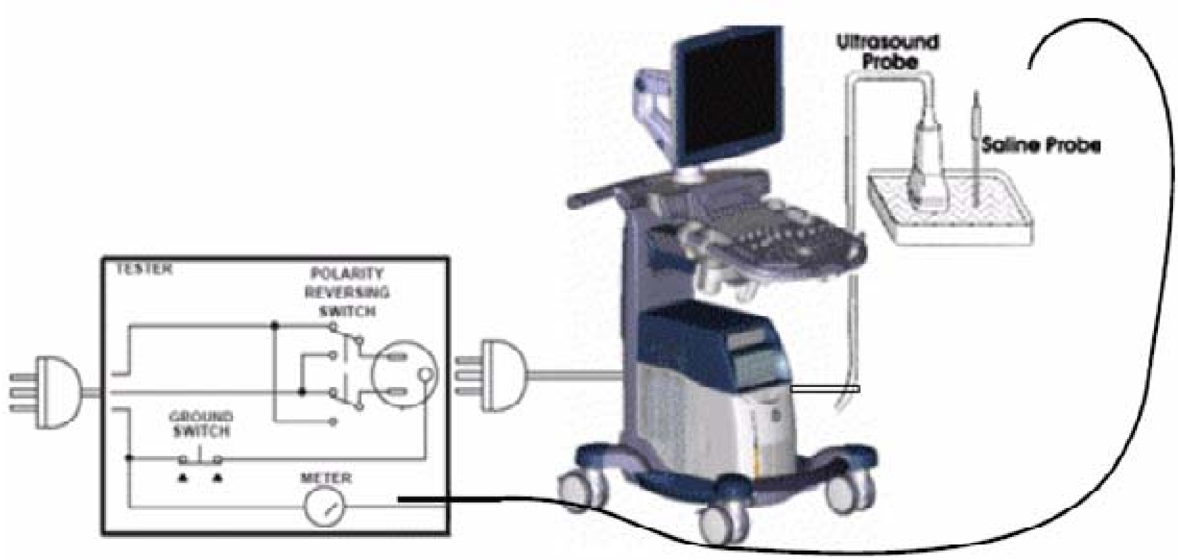


Figure 10-5 Set Up for Probe Leakage Current

NOTE: Saline water pod should be insulated from floor and earth ground.

Table 10-18 Typical Data Sheet for Type BF Patient Leakage Current Test

Tester Neutral	Tester Polarity Switch	Ground Switch	Measured Earth Leakage Current
Closed	Normal	Closed	
Closed	Normal	Open	
Closed	Reversed	Closed	
Closed	Reversed	Open	
Open	Normal	Closed	
Open	Reversed	Closed	

10-7-8 Type BF Patient Leakage Current - Mains to Probe

Reference the procedure in the IEC 60601-1.Measure leakage current flow from mains to Probe.

DANGER **Electric Shock Hazard.**
Line voltage is applied to Probe during this test. To avoid possible electric shock hazard, the system being tested must not be touched by patients, users or anyone during testing.

CAUTION **Equipment damage possibility. Never switch the Polarity and the status of Neutral when the unit is powered ON. Be sure to turn the unit power OFF before switching them using the POLARITY switch and/or the NEUTRAL switch. Otherwise, the unit may be damaged.**

Table 10-19 Typical Data Sheet for Type BF Patient Leakage Current - Mains to Probe

Tester Neutral	Tester Polarity Switch	Ground Switch	Measured Leakage Current
Closed	Normal	Closed	
Closed	Reversed	Closed	

NOTE: It is not necessary to test each lead individually or power condition combinations as required in previous tests.

Section 10-8
When There's Too Much Leakage Current...

10-8-1 Earth and/or Enclosure Fails

Check the ground on the power cord and plug for continuity. Ensure the ground is not broken, frayed, or intermittent. Replace any defective part.

Tighten all grounds. Ensure star washers are under all ground studs.

Inspect wiring for bad crimps, poor connections, or damage.

Test the wall outlet; verify it is grounded and is free of other wiring abnormalities. Notify the user or owner to correct any deviations. As a workaround, check the other outlets to see if they could be used instead.

NOTE: No outlet tester can detect the condition where the white neutral wire and the green grounding wire are reversed. If later tests indicate high leakage currents, this should be suspected as a possible cause and the outlet wiring should be visually inspected.

10-8-2 Probe Fails

- Test another probe to isolate if the fault lies with the probe or the scanner.

NOTE: Each probe will have some amount of leakage, dependent on its design. Small variations in probe leakage currents are normal from probe to probe. Other variations will result from differences in line voltage and test lead placement. The maximum allowable leakage current for body surface contact probe differs from an inter-cavity probe. Be sure to enter the correct probe type in the appropriate space on the check list.

- Test the probe in another connector to isolate if the fault lies with the probe or the scanner.

  If excessive leakage current is slot dependent, inspect the system connector for bent pins, poor connections, and ground continuity.

  If the problem remains with the probe, replace the probe.

10-8-3 Peripheral Fails

Tighten all grounds. Ensure star washers are under all ground studs.

Inspect wiring for bad crimps, poor connections, or damage.

10-8-4 Still Fails

If all else fails, begin isolation by removing the probes, external peripherals, and then the on-board peripherals one at a time while monitoring the leakage current measurement.

10-8-5 New Unit

If the leakage current measurement tests fail on a new unit and if situation cannot be corrected, submit a Safety Failure Report to document the system problem. Remove unit from operation.

ULTRASOUND INSPECTION CERTIFICATE

Customer Name:		System ID:	Dispatch Number / Date Performed:	Warranty/Contract/HBS
System Type		Model Number:	Serial Number:	Manufacture Date:
Probe 1:	Frequency:	Scan Format*:	Model Number:	Serial Number:
Probe 2:	Frequency:	Scan Format*:	Model Number:	Serial Number:
Probe 3:	Frequency:	Scan Format*:	Model Number:	Serial Number:
Probe 4:	Frequency:	Scan Format*:	Model Number:	Serial Number:
Probe 5:	Frequency:	Scan Format*:	Model Number:	Serial Number:
Probe 6:	Frequency:	Scan Format*:	Model Number:	Serial Number:
Probe 7:	Frequency:	Scan Format*:	Model Number:	Serial Number:
Probe 8:	Frequency:	Scan Format*:	Model Number:	Serial Number:
Probe 9:	Frequency:	Scan Format*:	Model Number:	Serial Number:

* Scan Format: Phased Array, Linear Array, Curved Array, Mechanical Array or Other

FUNCTIONAL CHECKS

PHYSICAL INSPECTION AND CLEANING

Functional Check (if applicable)	OK? or N/A		Physical Inspection and Cleaning (if applicable)	Inspect	Clean
B-Mode Function			Console		
M-Mode Function			Monitor		
Doppler Modes Functions					
Color Modes Functions			Air Filter		
3D/4D-Mode Function			Probe Holders		
Applicable Software Options			External I/O		
Applicable Hardware Options			Wheels, Brakes & Swivel Locks		
Control Panel			Cables and Connectors		
Monitor			Approved Peripherals (VCR, DVD Drive, Printers, etc.)		
Measurement Accuracy					

COMMENTS:

ELECTRICAL SAFETY

Outlet and Ground Continuity test

Outlet/Ground Continuity	Max Value Allowed	Value Measured	OK?	Comments
Outlet (correct ground &wiring config.)	N/A	N/A		
System Ground Continuity	0.2 Ohm			

Earth leakage current test

Tester Neutral	Tester Polarity Switch	Max Value Allowed	Value Measured	OK?	Comments
Enter Name of tested peripheral here:					
Closed	Normal	0.3mA(USA)/0.5mA(Others)			
Closed	Reversed	0.3mA(USA)/0.5mA(Others)			
Open	Normal	1mA			
Open	Reversed	1mA			

Enclosure leakage current test

Tester Neutral	Tester Polarity Switch	Protective Earth Switch	Max Value Allowed	Test 1 Wheel	Test 2 LCD	Optional Test 3	Optional Test 4	OK?	Comments
Enter Name of tested peripheral here:									
Closed	Normal	Closed	0.1mA(USA)/ 0.1mA(Others)						
Closed	Normal	Open	0.3mA(USA)/ 0.5mA(Others)						
Closed	Reversed	Closed	0.1mA(USA)/ 0.1mA(Others)						
Closed	Reversed	Open	0.3mA(USA)/ 0.5mA(Others)						
Open	Normal	Closed	0.5mA(USA)/ 0.5mA(Others)						
Open	Reversed	Closed	0.5mA(USA)/ 0.5mA(Others)						

Type BF Patient Leakage Current Test - Probes (This test should be done for all probe)

Tester Neutral	Tester Polarity Switch	Ground Switch	Max Value Allowed	Value Measured	OK?	Comments
Closed	Normal	Closed	0.1mA			
Closed	Normal	Open	0.5mA			
Closed	Reversed	Closed	0.1mA			
Closed	Reversed	Open	0.5mA			
Open	Normal	Closed	0.5mA			
Open	Reversed	Closed	0.5mA			

Type BF Patient Leakage Current Test - Mains to Probe

Tester Neutral	Tester Polarity Switch	Ground Switch	Max Value Allowed	Value Measured	OK?	Comments
Closed	Normal	Closed	5mA			
Closed	Reversed	Closed	5mA			

Final Check. All system covers are in place. System scans with all probes as expected.

Accepted by: ____

U

V

W

Appendix A
Acoustic Output

Section A-1
Overview

This chapter provides **Acoustic Output Reporting Tables for IEC60601-2-37** (according to Table 101) and a **Summary of measured Quantities for Index Determination** (according to IEC60601-2-37 DD.7, Table DD.2) for all applicable Transducers at different Operating Modes.

A-1-1 Voluson® S6

Table A-1 Tables for Transducers at different Operating Modes

Table A-1 Tables for Transducers at different Operating Modes

A-1-1-1 Tables for 12L-RS at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: '12L-RS' **Operating Mode:** B-Mode
SW-Release: Voluson S6 11.0.0

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1$ cm²	$A_{aprt} > 1$ cm²		
Global Maximum Index Value				1.2	0.9	-	-	-	1.7
	IEC	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3.2					
	P	W_o	(mW)		71	-		-	104
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
Assoc.	z_s	z_1	(cm)				-		
Acoustic	z_{bp}	z_{bp}	(cm)				-		
Parameter	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	1.6					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	6.5	7.4	-	-	-	6.5
	Dim of A_{aprt}		X (cm)		2.9	-	-	-	4.4
			Y (cm)		0.4	-	-	-	0.4
	t_d	PD	(µsec)	1.4					
	prr	PRF	(Hz)	6896					
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	4.4					
Other	d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)					-	
Information	Focal Length		FL_x (cm)		1.6	-	-		1.6
			FL_y (cm)		1.3	-	-		1.3
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	513					
	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	8.0	8.0				2.0
	B-Imagesector width		(cm)	3.7	3.7				3.7
	Quality			low	low				low
Operating	Zoom			1.0	1.0				1.0
Control	Foc. Zones			1	1				1
Conditions	Frequency Setting			-	norm				-
	SENS PRI			1.0	-				1.0
	Power		(%)	100	100				100
	ZoomBox start		(cm)	6.1	5.9				0.5
	ZoomBox end		(cm)	7.7	7.5				1.5
	ZoomBox width		(cm)	3.7	2.3				3.7
	Mode Type			BFlow	B(CE)				BFlow
	Focal Depth		(cm)	1.6	1.6				1.6

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: '12L-RS' **Operating Mode:** B-Mode
SW-Release: Voluson S6 11.0.0

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \le 1$ cm²	$A_{aprt} > 1$ cm²			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	6.5	7.4	-	-	7.4	-	
Output Power	P	(mW)			-	-		-	104
Bounded output Power	P_1	(mW)		24			24		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	1.42					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.70					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	4.4						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3.2						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			1.7
Equivalent aperture diameter	D_{eq}	(cm)				-			1.5
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1.6						

A-1-1-2 Tables for 12L-RS at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: '12L-RS' **Operating Mode:** B+M Mode
SW-Release: Voluson S6 11.0.0

Index Label				MI	TIS scan	TIS non-scan A_{aprt}≤1 cm²	TIS non-scan A_{aprt}>1 cm²	TIB non-scan	TIC
Global Maximum Index Value				1.5	0.8	-	-	-	1.5
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3.6					
	P	W_o	(mW)		85	-		-	85
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	0.7					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	5.8	5.7	-	-	-	5.7
	Dim of A_{aprt}		X (cm)		1.4	-	-	-	1.4
			Y (cm)		0.4	-	-	-	0.4
Other Information	t_d	PD	(µsec)	0.2					
	prr	PRF	(Hz)	450					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	4.1					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		5.0	-	-		5.0
			FL_y (cm)		1.3	-	-		1.3
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	545					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	8.0	8.0				8.0
	B-Imagesector width		(cm)	3.7	3.7				3.7
	Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			resol	resol				resol
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	Mode Type			M(Harm)	M(Harm)				M(Harm)
	Focal Depth		(cm)	0.9	5.0				5.0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: '12L-RS' **Operating Mode:** B+M Mode
SW-Release: Voluson S6 11.0.0

Index			MI	TIS Scanning	TIS Non-Scanning A_{aprt}≤1 cm²	TIS Non-Scanning A_{aprt}>1 cm²	TIB Scanning	TIB Non-Scanning	TIC
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	5.8	5.7	-	-	5.7	-	
Output Power	P	(mW)			-	-		-	85
Bounded output Power	P_1	(mW)		28			19		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.17					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.13					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	4.1						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3.6						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			0.6
Equivalent aperture diameter	D_{eq}	(cm)				-			0.9
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	0.7						

A-1-1-3 Tables for 12L-RS at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: '12L-RS' **Operating Mode:** Pulsed Doppler
SW-Release: Voluson S6 11.0.0

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				1.4	-	1.7	-	1.7	1.7
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3.7					
	P	W_o	(mW)		-	50		37	50
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					1.1	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	0.9					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0.3	
	f_{awf}	f_c	(MHz)	6.5	-	7.0	-	5.3	7.0
	Dim of A_{aprt}		X (cm)		-	1.0	-	1.0	1.0
			Y (cm)		-	0.4	-	0.4	0.4
Other Information	t_d	PD	(µsec)	0.2					
	prr	PRF	(Hz)	901					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	4.5					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					0.0	
	Focal Length		FL_x (cm)		-	6.0	-		6.0
			FL_y (cm)		-	1.3	-		1.3
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	488					
Operating Control Conditions	Gate width		(cm)	0.1		0.7		0.3	0.7
	Gate pos		(cm)	0.0		3.3		3.2	3.3
	Velocity Range		(kHz)	0.9		3.3		3.3	3.3
	Power		(%)	100		100		100	100

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: '12L-RS' **Operating Mode:** Pulsed Doppler
SW-Release: Voluson S6 11.0.0

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	6.5	-	7.0	-	-	5.3	
Output Power	P	(mW)			50	-		37	50
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				-		25.0	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		355	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		238	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.18					0.11	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.12					0.07	
Peak-rarefactional acoustic pressure	p_r	(MPa)	4.5						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3.7						
-12 dB output beam area	A_{aprt}	(cm²)			0.4	-			0.4
Equivalent aperture diameter	D_{eq}	(cm)				-			0.7
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						1.1	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	0.9						

A-1-1-4 Tables for 12L-RS at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: '12L-RS' **Operating Mode:** Color Flow
SW-Release: Voluson S6 11.0.0

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				1.5	1.0	-	-	-	1.7
	IEC	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3.7					
	P	W_o	(mW)		49	-		-	101
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
Assoc.	z_s	z_1	(cm)				-		
Acoustic	z_{bp}	z_{bp}	(cm)				-		
Parameter	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	0.9					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	6.2	7.0	-	-	-	7.0
	Dim of A_{aprt}		X (cm)		1.6	-	-	-	4.1
			Y (cm)		0.4	-	-	-	0.4
	t_d	PD	(µsec)	1.0					
	prr	PRF	(Hz)	6846					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	4.5					
Other	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
Information	Focal Length		FL_x (cm)		6.0	-	-		2.0
			FL_y (cm)		1.3	-	-		1.3
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	498					
	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	8.0	8.0				8.0
	B-Imagesector width		(cm)	3.7	3.7				3.7
	B-Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			2	2				2
Operating	Frequency Setting			resol	resol				resol
Control	SENS PRI			-	-				-
Conditions	B Tx Power		(%)	1	1				1
	CFM Box start		(cm)	0.0	3.4				0.0
	CFM Box end		(cm)	1.2	4.6				1.2
	CFM Box width		(cm)	3.7	0.6				3.7
	CFM Tx power		(%)	100	100				100
	Ensemble			22.0	9.0				10.0
	Line Density			1	2				9
	Flow Res			low	low				low
	Velocity Range		(kHz)	18	0.1				18.0
	CFM Quality			low	high				low
	CFM Frequency			mid	high				high

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: '12L-RS' **Operating Mode:** Color Flow
SW-Release: Voluson S6 11.0.0

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	6.2	7.0	-	-	7.0	-	
Output Power	P	(mW)			-	-		-	101
Bounded output Power	P_1	(mW)		31			31		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.70					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.48					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	4.5						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3.7						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			1.6
Equivalent aperture diameter	D_{eq}	(cm)				-			1.4
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	0.9						

A-1-1-5 Tables for RAB4-8-RS at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'RAB4-8-RS' **Operating Mode:** B-Mode
SW-Release: Voluson S6 11.0 TestMizar

Index Label					MI	TIS			TIB	TIC
						scan	non-scan		non-scan	
							$A_{aprt} \le 1$ cm²	$A_{aprt} > 1$ cm²		
Global Maximum Index Value					1.1	0.3	-	-	-	1.0
Assoc. Acoustic Parameter	IEC	FDA		Units						
	$p_{r\alpha}$	$p_{r.3}$		(MPa)	1.8					
	P	W_o		(mW)		67	-		-	130
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$		(mW)				-		
	z_s	z_1		(cm)				-		
	z_{bp}	z_{bp}		(cm)				-		
	z_b	z_{sp}		(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}		(cm)	3.0					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$		(cm)					-	
	f_{awf}	f_c		(MHz)	2.7	3.6	-	-	-	3.6
	Dim of A_{aprt}		X	(cm)		3.8	-	-	-	7.4
			Y	(cm)		1.1	-	-	-	1.1
Other Information	t_d	PD		(µsec)	0.7					
	prr	PRF		(Hz)	4545					
	p_r at max. I_{pi}	p_r@PII_{max}		(MPa)	2.3					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}		(cm)					-	
	Focal Length		FL_x	(cm)		3.0	-	-		11.0
			FL_y	(cm)		6.3	-	-		6.3
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}		(W/cm²)	172					
Operating Control Conditions	B-Imagesector start			(cm)	0.0	0.0				0.0
	B-Imagesector end			(cm)	26.0	3.0				3.0
	B-Imagesector angle			(Degree)	70.0	70.0				70.0
	Quality				high	high				low
	Zoom				1.0	1.0				1.0
	Foc. Zones				1	1				1
	Frequency Setting				Low	-				-
	SENS PRI				-	15.0				15.0
	Power			(%)	100	100				100
	ZoomBox start			(cm)	7.8	0.8				0.8
	ZoomBox end			(cm)	13.0	2.8				2.8
	ZoomBox angle			(Degree)	70.0	42.5				70.0
	Mode Type				B(Harm)	BFlow				BFlow
	Focal Depth			(cm)	3.0	3.0				11.0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'RAB4-8-RS' **Operating Mode:** B-Mode
SW-Release: Voluson S611.0 TestMizar

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \le 1$ cm²	$A_{aprt} > 1$ cm²			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	3.0	3.6	-	-	3.6	-	
Output Power	P	(mW)			-	-		-	130
Bounded output Power	P_1	(mW)		18			18		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.23					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.11					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3.3						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.3						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			8.2
Equivalent aperture diameter	D_{eq}	(cm)				-			3.2
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	3.4						

A-1-1-6 Tables for RAB4-8-RS at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'RAB4-8-RS' **Operating Mode:** B+M Mode
SW-Release: Voluson S6 11.0 TestMizar

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				1.3	0.3	-	-	-	0.8
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.3					
	P	W_o	(mW)		77	-		-	77
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	3.4					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	3.0	2.7	-	-	-	2.7
	Dim of A_{aprt}		X (cm)		2.0	-	-	-	2.0
			Y (cm)		1.3	-	-	-	1.3
Other Information	t_d	PD	(µsec)	0.5					
	prr	PRF	(Hz)	900					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3.3					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		12.0	-	-		12.0
			FL_y (cm)		6.3	-	-		6.3
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	242					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	26.0	26.0				26.0
	B-Imagesector angle		(Degree)	70.0	70.0				70.0
	Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			norm	penet				penet
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	Mode Type			M	M				M
	Focal Depth		(cm)	6.0	12.0				12.0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'RAB4-8-RS' **Operating Mode:** B+M Mode
SW-Release: Voluson S6 11.0 TestMizar

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	3.0	2.7	-	-	2.7	-	
Output Power	P	(mW)			-	-		-	77
Bounded output Power	P_1	(mW)		23			59		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.23					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.10					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3.3						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.2						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			2.5
Equivalent aperture diameter	D_{eq}	(cm)				-			1.8
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	4.1						

A-1-1-7 Tables for RAB4-8-RS at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'RAB4-8-RS' **Operating Mode:** Pulsed Doppler
SW-Release: Voluson S6 11.0.0 Mizar Test

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				1.3	-	-	0.6	1.7	1.1
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.3					
	P	W_o	(mW)		-	-		45	63
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				41.1		
	z_s	z_1	(cm)				2.1		
	z_{bp}	z_{bp}	(cm)				2.1		
	z_b	z_{sp}	(cm)					3.4	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	3.2					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0.3	
	f_{awf}	f_c	(MHz)	3.0	-	-	2.9	3.0	2.9
	Dim of A_{aprt}		X (cm)		-	-	1.2	0.9	1.2
			Y (cm)		-	-	1.3	1.3	1.3
Other Information	t_d	PD	(µsec)	1.3					
	prr	PRF	(Hz)	901					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3.2					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					0.0	
	Focal Length		FL_x (cm)		-	-	11.0		11.0
			FL_y (cm)		-	-	6.3		6.3
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	206					
Operating Control Conditions	Gate width		(cm)	0.1			0.1	0.1	0.1
	Gate pos		(cm)	5.2			7.8	5.2	7.8
	Velocity Range		(kHz)	0.9			1.3	2.2	1.3
	Power		(%)	100			100	100	100

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'RAB4-8-RS' **Operating Mode:** Pulsed Doppler
SW-Release: Voluson S6 11.0.0 Mizar Test

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	3.0	-	-	2.9	-	3.0	
Output Power	P	(mW)			-	63		45	63
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				41		22.7	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				570		619	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				250		300	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.50					0.28	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.26					0.14	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3.2						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.3						
-12 dB output beam area	A_{aprt}	(cm²)			-	1.5			1.5
Equivalent aperture diameter	D_{eq}	(cm)				1.4			1.4
Depth for *TIS*	z_s	(cm)				2.1			
Depth for *TIB*	z_b	(cm)						3.4	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	3.2						

A-1-1-8 Tables for RAB4-8-RSD at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'RAB4-8-RS' **Operating Mode:** Color Flow
SW-Release: Voluson S6 11.0 TestMizar

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt}\le 1\ cm^2$	$A_{aprt}>1\ cm^2$		
Global Maximum Index Value				1.3	0.4	-	-	-	1.2
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.2					
	P	W_o	(mW)		122	-		-	148
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	1.4					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	3.0	3.4	-	-	-	3.0
	Dim of A_{aprt}		X (cm)		5.4	-	-	-	6.1
			Y (cm)		1.3	-	-	-	1.3
Other Information	t_d	PD	(µsec)	2.3					
	prr	PRF	(Hz)	1262					
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	2.5					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		4.5	-	-		11.0
			FL_y (cm)		6.3	-	-		6.3
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	199					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	26.0	26.0				26.0
	B-Imagesector angle		(Degree)	70.0	70.0				70.0
	B-Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			norm	norm				norm
	SENS PRI			-	-				-
	B Tx Power		(%)	1	1				1
	CFM Box start		(cm)	0.9	1.8				12.9
	CFM Box end		(cm)	4.8	5.7				16.8
	CFM Box angle		(Degree)	70.0	70.0				70.0
	CFM Tx power		(%)	100	100				100
	Ensemble			7.0	7.0				9.0
	Line Density			1	1				2
	Flow Res			high	high				high
	Velocity Range		(kHz)	0.1	7.5				3.2
	CFM Quality			low	low				high
	CFM Frequency			low	mid				low

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'RAB4-8-RS' **Operating Mode:** Color Flow
SW-Release: Voluson S6 11.0 TestMizar

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt}\le 1\ cm^2$	$A_{aprt}>1\ cm^2$			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	3.0	3.4	-	-	3.4	-	
Output Power	P	(mW)			-	-		-	148
Bounded output Power	P_1	(mW)		22			22		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.62					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.46					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.5						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.2						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			8.0
Equivalent aperture diameter	D_{eq}	(cm)				-			3.2
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1.4						

A-1-1-9 Tables for RAB4-8-RS at Color/Motion Mode (CM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'RAB4-8-RS' **Operating Mode:** cM-Mode
SW-Release: Voluson S6 11.0 TestMizar

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt}\leq1$ cm²	$A_{aprt}>1$ cm²		
Global Maximum Index Value				1.3	0.6	-	-	-	1.1
	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.2					
	P	W_o	(mW)		63	-		-	63
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
Assoc.	z_s	z_1	(cm)				-		
Acoustic	z_{bp}	z_{bp}	(cm)				-		
Parameter	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	1.4					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	3.0	3.0	-	-	-	3.0
	Dim of A_{aprt}		X (cm)		1.2	-	-	-	1.2
			Y (cm)		1.3	-	-	-	1.3
	t_d	PD	(µsec)	2.2					
	prr	PRF	(Hz)	150					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2.5					
Other	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
Information	Focal Length		FL_x (cm)		11.0	-	-		11.0
			FL_y (cm)		6.3	-	-		6.3
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	207					
	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	26.0	26.0				26.0
	B-Imagesector angle		(Degree)	20	20				20
	B-Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
Operating	Frequency Setting			norm	norm				norm
Control	SENS PRI			-	-				-
Conditions	B Tx Power		(%)	1	1				1
	Mc Tx Power		(%)	100	100				100
	Ensemble			16	8				8
	Flow Res			high	high				high
	Velocity Range		(kHz)	0.1	1.3				1.3
	Speed			6.0	6.0				6.0
	Mc Frequency			Low	Low				Low

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'RAB4-8-RS' **Operating Mode:** cM-Mode
SW-Release: Voluson S6 11.0 TestMizar

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt}\leq1$ cm²	$A_{aprt}>1$ cm²			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	3.0	3.0	-	-	3.0	-	
Output Power	P	(mW)			-	-		-	63
Bounded output Power	P_1	(mW)		41			121		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.43					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.33					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.5						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.2						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			1.5
Equivalent aperture diameter	D_{eq}	(cm)				-			1.4
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1.2						

A-1-1-10 Tables for RIC5-9W-RS at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'RIC5-9W-RS' **Operating Mode:** B-Mode
SW-Release: Voluson S6 11.0.0

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1\ cm^2$	$A_{aprt} > 1\ cm^2$		
Global Maximum Index Value				1.3	0.2	-	-	-	0.3
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.5					
	P	W_o	(mW)		6	-		-	23
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	0.1					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	3.8	8.8	-	-	-	5.0
	Dim of A_{aprt}	X	(cm)		1.1	-	-	-	4.2
		Y	(cm)		0.6	-	-	-	0.6
Other Information	t_d	PD	(µsec)	0.5					
	prr	PRF	(Hz)	2484					
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	2.9					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					-	
	Focal Length	FL_x	(cm)		4.0	-	-		8.0
		FL_y	(cm)		3.5	-	-		3.5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	252					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	16.0	16.0				16.0
	B-Imagesector angle		(Degree)	146.3	20.0				146.3
	Quality			high	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			Low	-				-
	SENS PRI			-	15.0				15.0
	Power		(%)	100	100				100
	ZoomBox start		(cm)	3.2	2.7				11.9
	ZoomBox end		(cm)	6.4	5.7				14.9
	ZoomBox angle		(Degree)	146.3	15.0				146.3
	Mode Type			B(Harm)	BFlow				BFlow
	Focal Depth		(cm)	1.0	4.0				8.0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'RIC5-9W-RS' **Operating Mode:** B-Mode
SW-Release: Voluson S8 11.0.0

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \le 1\ cm^2$	$A_{aprt} > 1\ cm^2$			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	3.8	8.8	-	-	8.8	-	
Output Power	P	(mW)			-	-		-	23
Bounded output Power	P_1	(mW)		6			6		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.16					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.12					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.9						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.5						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			2.5
Equivalent aperture diameter	D_{eq}	(cm)				-			1.8
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1.0						

A-1-1-11 Tables for RIC5-9W-RS at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'RIC5-9W-RS' **Operating Mode:** B+M Mode
SW-Release: Voluson S6 11.0.0

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				1.1	0.2	-	-	-	0.3
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.2					
	P	W_o	(mW)		15	-		-	15
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	0.2					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	4.2	5.9	-	-	-	5.5
	Dim of A_{aprt}		X (cm)		1.0	-	-	-	1.0
			Y (cm)		0.6	-	-	-	0.6
Other Information	t_d	PD	(µsec)	0.3					
	prr	PRF	(Hz)	450					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2.8					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		6.5	-	-		6.5
			FL_y (cm)		3.5	-	-		3.5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	249					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	16.0	16.0				16.0
	B-Imagesector angle		(Degree)	146.3	146.3				146.3
	Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			resol	resol				norm
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	Mode Type			M(Harm)	M				M
	Focal Depth		(cm)	3.0	6.5				6.5

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'RIC5-9W-RS' **Operating Mode:** B+M Mode
SW-Release: Voluson S8 11.0.0

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	4.2	5.9	-	-	3.8	-	
Output Power	P	(mW)			-	-		-	15
Bounded output Power	P_1	(mW)		7			13		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.13					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.08					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.8						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.2						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			0.6
Equivalent aperture diameter	D_{eq}	(cm)				-			0.9
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1.7						

A-1-1-12 Tables for RIC5-9W-RS at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'RIC5-9W-RS' **Operating Mode:** Pulsed Doppler
SW-Release: Voluson S6 11.0.0

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				1.0	-	0.6	-	0.6	0.6
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.3					
	P	W_o	(mW)		-	21		20	21
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					1.8	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	0.2					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0.4	
	f_{awf}	f_c	(MHz)	5.8	-	6.0	-	5.5	6.0
	Dim of A_{aprt}		X (cm)		-	1.0	-	1.0	1.0
			Y (cm)		-	0.6	-	0.6	0.6
Other Information	t_d	PD	(µsec)	0.4					
	prr	PRF	(Hz)	901					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3.4					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					0.0	
	Focal Length		FL_x (cm)		-	8.0	-		8.0
			FL_y (cm)		-	3.5	-		3.5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	188					
Operating Control Conditions	Gate width		(cm)	0.1		0.2		0.4	0.2
	Gate pos		(cm)	0.0		4.8		4.9	4.8
	Velocity Range		(kHz)	0.9		1.3		1.3	1.3
	Power		(%)	100		100		100	100

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'RIC5-9W-RS' **Operating Mode:** Pulsed Doppler
SW-Release: Voluson S8 11.0.0

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	5.8	-	6.0	-	-	5.5	
Output Power	P	(mW)			21	-		20	21
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				-		10.3	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		243	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		121	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.14					0.19	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.07					0.09	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3.4						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.4						
-12 dB output beam area	A_{aprt}	(cm²)			0.6	-			0.6
Equivalent aperture diameter	D_{eq}	(cm)				-			0.9
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						1.8	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1.7						

A-1-1-13 Tables for RIC5-9W-RS at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'RIC5-9W-RS' **Operating Mode:** Color Flow
SW-Release: Voluson S6 11.0.0

Index Label				MI	TIS scan	TIS non-scan $A_{aprt}\le1$ cm²	TIS non-scan $A_{aprt}>1$ cm²	TIB non-scan	TIC
Global Maximum Index Value				1.0	0.2	-	-	-	0.4
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.3					
	P	W_o	(mW)		23	-		-	28
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	0.7					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	5.0	6.1	-	-	-	6.0
	Dim of A_{aprt}	X	(cm)		3.2	-	-	-	3.9
		Y	(cm)		0.6	-	-	-	0.6
Other Information	t_d	PD	(µsec)	1.4					
	prr	PRF	(Hz)	1448					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2.6					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length	FL_x	(cm)		1.0	-	-		8.0
		FL_y	(cm)		3.5	-	-		3.5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	195					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	16.0	16.0				16.0
	B-Imagesector angle		(Degree)	146.3	146.3				146.3
	B-Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			norm	norm				norm
	SENS PRI			-	-				-
	B Tx Power		(%)	1	1				1
	CFM Box start		(cm)	0.0	0.0				10.2
	CFM Box end		(cm)	2.4	2.4				12.6
	CFM Box angle		(Degree)	146.3	146.3				146.3
	CFM Tx power		(%)	100	100				100
	Ensemble			7.0	22.0				9.0
	Line Density			1	1				2
	Flow Res			low	low				low
	Velocity Range		(kHz)	0.1	13.0				4.0
	CFM Quality			low	low				high
	CFM Frequency			low	high				high

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'RIC5-9W-RS' **Operating Mode:** Color Flow
SW-Release: Voluson S8 11.0.0

Index			MI	TIS Scanning	TIS Non-Scanning $A_{aprt}\le1$ cm²	TIS Non-Scanning $A_{aprt}>1$ cm²	TIB Scanning	TIB Non-Scanning	TIC
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	5.0	6.1	-	-	6.1	-	
Output Power	P	(mW)			-	-		-	28
Bounded output Power	P_1	(mW)		7			7		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.34					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.27					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.6						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.3						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			2.4
Equivalent aperture diameter	D_{eq}	(cm)				-			1.7
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	0.7						

A-1-1-14 Tables for RIC5-9W-RS at Color/Motion Mode (CM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'RIC5-9W-RS' **Operating Mode:** cM-Mode
SW-Release: Voluson S6 11.0.0

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				1.0	0.6	-	-	-	0.6
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.3					
	P	W_o	(mW)		22	-		-	22
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	1.2					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	5.5	6.0	-	-	-	6.0
	Dim of A_{aprt}		X (cm)		1.0	-	-	-	1.0
			Y (cm)		0.6	-	-	-	0.6
Other Information	t_d	PD	(µsec)	1.0					
	prr	PRF	(Hz)	150					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3.0					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		8.0	-	-		8.0
			FL_y (cm)		3.5	-	-		3.5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	145					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	16.0	16.0				16.0
	B-Imagesector angle		(Degree)	20	146				146
	B-Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			norm	norm				norm
	SENS PRI			-	-				-
	B Tx Power		(%)	90	1				1
	Mc Tx Power		(%)	100	100				100
	Ensemble			16	12				12
	Flow Res			high	high				high
	Velocity Range		(kHz)	0.1	2.4				2.4
	Speed			6.0	6.0				6.0
	Mc Frequency			Mid	High				High

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'RIC5-9W-RS' **Operating Mode:** cM-Mode
SW-Release: Voluson S8 11.0.0

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	5.5	6.0	-	-	5.5	-	
Output Power	P	(mW)			-	-		-	22
Bounded output Power	P_1	(mW)		22			23		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.22					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.14					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3.0						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.3						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			0.6
Equivalent aperture diameter	D_{eq}	(cm)				-			0.9
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1.2						

A-1-1-15 Tables for AB2-7-RS at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'AB2-7-RS' **Operating Mode:** B-Mode
SW-Release: Voluson S6 11.0.0.A

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				1.1	0.4	-	-	-	1.6
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	1.8					
	P	W_o	(mW)		90	-		-	233
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	5.5					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2.8	3.1	-	-	-	3.0
	Dim of A_{aprt}		X (cm)		3.1	-	-	-	8.0
			Y (cm)		1.3	-	-	-	1.3
Other Information	t_d	PD	(µsec)	0.5					
	prr	PRF	(Hz)	5703					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2.9					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		12.0	-	-		15.0
			FL_y (cm)		7.0	-	-		7.0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	120					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	28.0	4.0				4.0
	B-Imagesector angle		(Degree)	80.0	80.0				80.0
	Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			penet	-				-
	SENS PRI			-	1.0				1.0
	Power		(%)	100	100				100
	ZoomBox start		(cm)	2.8	0.9				0.3
	ZoomBox end		(cm)	8.4	3.4				2.8
	ZoomBox angle		(Degree)	80.0	16.0				80.0
	Mode Type			B	BFlow				BFlow
	Focal Depth		(cm)	7.0	12.0				15.0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'AB2-7-RS' **Operating Mode:** B-Mode
SW-Release: Voluson S6 11.0.0.A

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	2.8	3.1	-	-	3.1	-	
Output Power	P	(mW)			-	-		-	233
Bounded output Power	P_1	(mW)		29			29		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.21					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.07					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3.1						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	1.8						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			10.4
Equivalent aperture diameter	D_{eq}	(cm)				-			3.6
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	5.5						

A-1-1-16 Tables for AB2-7-RS at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'AB2-7-RS' **Operating Mode:** B+M Mode
SW-Release: Voluson S6 11.0.0.A

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt}≤1\ cm^2$	$A_{aprt}>1\ cm^2$		
Global Maximum Index Value				1.2	0.4	-	-	-	1.2
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.0					
	P	W_o	(mW)		116	-		-	116
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	5.1					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2.8	2.5	-	-	-	2.5
	Dim of A_{aprt}		X (cm)		2.0	-	-	-	2.0
			Y (cm)		1.3	-	-	-	1.3
Other Information	t_d	PD	(µsec)	0.5					
	prr	PRF	(Hz)	900					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3.4					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		13.0	-	-		13.0
			FL_y (cm)		7.0	-	-		7.0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	166					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	28.0	28.0				28.0
	B-Imagesector angle		(Degree)	80.0	80.0				80.0
	Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			penet	penet				penet
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	Mode Type			M	M(Harm)				M(Harm)
	Focal Depth		(cm)	7.0	13.0				13.0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'AB2-7-RS' **Operating Mode:** B+M Mode
SW-Release: Voluson S6 11.0.0.A

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt}≤1\ cm^2$	$A_{aprt}>1\ cm^2$			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	2.8	2.5	-	-	2.5	-	
Output Power	P	(mW)			-	-		-	116
Bounded output Power	P_1	(mW)		35			86		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.22					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.08					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3.4						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.0						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			2.6
Equivalent aperture diameter	D_{eq}	(cm)				-			1.8
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	5.1						

A-1-1-17 Tables for AB2-7-RS at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'AB2-7-RS' **Operating Mode:** Pulsed Doppler
SW-Release: Voluson S6 11.0.0.A

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				1.1	-	-	0.9	1.7	1.7
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	1.8					
	P	W_o	(mW)		-	-		57	119
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				57.0		
	z_s	z_1	(cm)				2.1		
	z_{bp}	z_{bp}	(cm)				2.0		
	z_b	z_{sp}	(cm)					2.0	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	4.6					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0.5	
	f_{awf}	f_c	(MHz)	2.7	-	-	3.2	3.0	4.0
	Dim of A_{aprt}		X (cm)		-	-	1.1	0.6	1.8
			Y (cm)		-	-	1.3	1.3	1.3
Other Information	t_d	PD	(µsec)	0.9					
	prr	PRF	(Hz)	901					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2.8					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					0.0	
	Focal Length		FL_x (cm)		-	-	9.0		15.0
			FL_y (cm)		-	-	7.0		7.0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	146					
Operating Control Conditions	Gate width		(cm)	0.1			0.1	0.1	0.3
	Gate pos		(cm)	2.8			5.6	0.0	8.5
	Velocity Range		(kHz)	0.9			1.3	1.3	0.9
	Power		(%)	100			100	100	100

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'AB2-7-RS' **Operating Mode:** Pulsed Doppler
SW-Release: Voluson S6 11.0.0.A

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	2.7	-	-	3.2	-	3.0	
Output Power	P	(mW)			-	93		57	119
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				59		38.2	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				416		185	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				149		121	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.31					0.14	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.13					0.09	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.8						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	1.8						
-12 dB output beam area	A_{aprt}	(cm²)			-	1.4			2.3
Equivalent aperture diameter	D_{eq}	(cm)				1.4			1.7
Depth for *TIS*	z_s	(cm)				2.1			
Depth for *TIB*	z_b	(cm)						2.0	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	4.6						

A-1-1-18 Tables for AB2-7-RS at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'AB2-7-RS' **Operating Mode:** Color Flow
SW-Release: Voluson S6 11.0.0.A

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt}\leq1$ cm²	$A_{aprt}>1$ cm²		
Global Maximum Index Value				1.1	0.8	-	-	-	1.7
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	1.8					
	P	W_o	(mW)		58	-		-	244
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	4.5					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2.7	3.2	-	-	-	4.0
	Dim of A_{aprt}	X	(cm)		1.1	-	-	-	7.5
		Y	(cm)		1.3	-	-	-	1.3
Other Information	t_d	PD	(µsec)	0.9					
	prr	PRF	(Hz)	3655					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2.8					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length	FL_x	(cm)		5.0	-	-		15.0
		FL_y	(cm)		7.0	-	-		7.0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	147					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	28.0	28.0				28.0
	B-Imagesector angle		(Degree)	80.0	20.0				80.0
	B-Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			penet	penet				penet
	SENS PRI			-	-				-
	B Tx Power		(%)	1	1				1
	CFM Box start		(cm)	4.0	2.0				11.9
	CFM Box end		(cm)	8.2	6.2				16.1
	CFM Box angle		(Degree)	80.0	7.5				80.0
	CFM Tx power		(%)	100	100				100
	Ensemble			22.0	7.0				22.0
	Line Density			1	10				9
	Flow Res			high	low				low
	Velocity Range		(kHz)	6	7.5				0.1
	CFM Quality			low	low				low
	CFM Frequency			low	mid				high

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'AB2-7-RS' **Operating Mode:** Color Flow
SW-Release: Voluson S6 11.0.0.A

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt}\leq1$ cm²	$A_{aprt}>1$ cm²			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	2.7	3.2	-	-	3.2	-	
Output Power	P	(mW)			-	-		-	244
Bounded output Power	P_1	(mW)		53			53		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.31					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.13					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.8						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	1.8						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			9.7
Equivalent aperture diameter	D_{eq}	(cm)				-			3.5
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	4.5						

A-1-1-19 Tables for AB2-7-RS at Color/Motion Mode (CM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'AB2-7-RS' **Operating Mode:** cM-Mode
SW-Release: Voluson S6 11.0.0.A

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				1.1	0.9	-	-	-	1.7
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	1.8					
	P	W_o	(mW)		92	-		-	106
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	4.5					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2.7	3.1	-	-	-	3.0
	Dim of A_{aprt}		X (cm)		1.1	-	-	-	1.4
			Y (cm)		1.3	-	-	-	1.3
Other Information	t_d	PD	(µsec)	0.9					
	prr	PRF	(Hz)	150					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2.8					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		9.0	-	-		12.0
			FL_y (cm)		7.0	-	-		7.0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	147					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	28.0	28.0				28.0
	B-Imagesector angle		(Degree)	20	20				20
	B-Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			penet	penet				penet
	SENS PRI			-	-				-
	B Tx Power		(%)	1	1				1
	Mc Tx Power		(%)	100	100				100
	Ensemble			16	12				16
	Flow Res			high	high				high
	Velocity Range		(kHz)	0.1	0.9				1.3
	Speed			6.0	6.0				6.0
	Mc Frequency			Low	Mid				Mid

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'AB2-7-RS' **Operating Mode:** cM-Mode
SW-Release: Voluson S6 11.0.0.A

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	2.7	3.1	-	-	2.6	-	
Output Power	P	(mW)			-	-		-	106
Bounded output Power	P_1	(mW)		59			125		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.31					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.13					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.8						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	1.8						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			1.8
Equivalent aperture diameter	D_{eq}	(cm)				-			1.5
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	4.5						

A-1-1-20 Tables for C1-5-RS at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'C1-5-RS' **Operating Mode:** B-Mode
SW-Release: Voluson S6 11.0.0.A

Index Label				MI	TIS scan	TIS non-scan $A_{aprt}\le1$ cm²	TIS non-scan $A_{aprt}>1$ cm²	TIB non-scan	TIC
Global Maximum Index Value				1.2	0.6	-	-	-	1.7
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	1.8					
	P	W_o	(mW)		69	-		-	230
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	2.3					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2.1	3.2	-	-	-	3.0
	Dim of A_{aprt}		X (cm)		1.9	-	-	-	6.6
			Y (cm)		1.3	-	-	-	1.3
Other Information	t_d	PD	(µsec)	1.0					
	prr	PRF	(Hz)	3211					
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	2.1					
	d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		1.5	-	-		20.0
			FL_y (cm)		6.0	-	-		6.0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	138					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	30.0	5.0				30.0
	B-Imagesector angle		(Degree)	20.0	20.0				68.9
	Quality			high	low				high
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			Low	resol				norm
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	ZoomBox start		(cm)	13.0	0.8				4.0
	ZoomBox end		(cm)	19.0	3.3				10.0
	ZoomBox angle		(Degree)	20.0	15.0				42.0
	Mode Type			B(Harm)	B				B
	Focal Depth		(cm)	1.5	1.5				20.0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'C1-5-RS' **Operating Mode:** B-Mode
SW-Release: Voluson S6 11.0.0.A

Index			MI	TIS Scanning	TIS Non-Scanning $A_{aprt}\le1$ cm²	TIS Non-Scanning $A_{aprt}>1$ cm²	TIB Scanning	TIB Non-Scanning	TIC
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	2.1	3.2	-	-	3.2	-	
Output Power	P	(mW)			-	-		-	230
Bounded output Power	P_1	(mW)		37			37		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.19					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.13					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.1						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	1.8						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			8.6
Equivalent aperture diameter	D_{eq}	(cm)				-			3.3
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	2.3						

A-1-1-21 Tables for C1-5-RS at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'C1-5-RS' **Operating Mode:** B+M Mode
SW-Release: Voluson S6 11.0.0.A

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1$ cm²	$A_{aprt} > 1$ cm²		
Global Maximum Index Value				0.9	0.4	-	-	-	1.1
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	1.4					
	P	W_o	(mW)		129	-		-	129
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	5.8					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2.4	2.6	-	-	-	2.6
	Dim of A_{aprt}		X (cm)		2.9	-	-	-	2.9
			Y (cm)		1.3	-	-	-	1.3
Other Information	t_d	PD	(µsec)	0.6					
	prr	PRF	(Hz)	450					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2.2					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		25.0	-	-		25.0
			FL_y (cm)		6.0	-	-		6.0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	129					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	30.0	30.0				30.0
	B-Imagesector angle		(Degree)	68.9	68.9				68.9
	Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			resol	penet				penet
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	Mode Type			M(Harm)	M				M
	Focal Depth		(cm)	9.0	25.0				25.0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'C1-5-RS' **Operating Mode:** B+M Mode
SW-Release: Voluson S6 11.0.0.A

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \le 1$ cm²	$A_{aprt} > 1$ cm²			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	2.4	2.6	-	-	2.1	-	
Output Power	P	(mW)			-	-		-	129
Bounded output Power	P_1	(mW)		37			87		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.20					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.08					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.2						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	1.4						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			3.8
Equivalent aperture diameter	D_{eq}	(cm)				-			2.2
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	5.8						

A-1-1-22 Tables for C1-5-RS at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'C1-5-RS' **Operating Mode:** Pulsed Doppler
SW-Release: Voluson S6 11.0.0.A

Index Label				MI	TIS scan	TIS non-scan $A_{aprt} \le 1\ cm^2$	TIS non-scan $A_{aprt} > 1\ cm^2$	TIB non-scan	TIC
Global Maximum Index Value				1.1	-	-	1.0	1.7	1.7
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.0					
	P	W_o	(mW)		-	-		45	137
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				77.1		
	z_s	z_1	(cm)				3.0		
	z_{bp}	z_{bp}	(cm)				3.0		
	z_b	z_{sp}	(cm)					3.9	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	4.5					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0.3	
	f_{awf}	f_c	(MHz)	3.2	-	-	2.8	2.1	3.2
	Dim of A_{aprt}		X (cm)		-	-	2.4	1.2	2.4
			Y (cm)		-	-	1.3	1.3	1.3
Other Information	t_d	PD	(µsec)	0.8					
	prr	PRF	(Hz)	901					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3.2					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					0.0	
	Focal Length		FL_x (cm)		-	-	20.0		20.0
			FL_y (cm)		-	-	6.0		6.0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	201					
Operating Control Conditions	Gate width		(cm)	0.1			0.1	0.4	0.2
	Gate pos		(cm)	3.0			12.0	3.2	12.0
	Velocity Range		(kHz)	0.9			2.2	1.3	2.2
	Power		(%)	100			100	100	100

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'C1-5-RS' **Operating Mode:** Pulsed Doppler
SW-Release: Voluson S6 11.0.0.A

Index			MI	TIS Scanning	TIS Non-Scanning $A_{aprt} \le 1\ cm^2$	TIS Non-Scanning $A_{aprt} > 1\ cm^2$	TIB Scanning	TIB Non-Scanning	TIC
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	3.2	-	-	2.8	-	2.1	
Output Power	P	(mW)			-	137		45	137
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				77		25.4	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				238		486	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				105		257	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.45					0.37	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.17					0.20	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3.2						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.0						
-12 dB output beam area	A_{aprt}	(cm²)			-	3.1			3.1
Equivalent aperture diameter	D_{eq}	(cm)				2.0			2.0
Depth for *TIS*	z_s	(cm)				3.0			
Depth for *TIB*	z_b	(cm)						3.9	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	4.5						

A-1-1-23 Tables for C1-5-RS at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'C1-5-RS' **Operating Mode:** Color Flow
SW-Release: Voluson S6 11.0.0.A

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				1.2	0.4	-	-	-	1.7
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	1.8					
	P	W_o	(mW)		37	-		-	262
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	6.9					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2.1	3.2	-	-	-	3.2
	Dim of A_{aprt}	X	(cm)		1.3	-	-	-	9.1
		Y	(cm)		1.3	-	-	-	1.3
Other Information	t_d	PD	(µsec)	2.1					
	prr	PRF	(Hz)	1160					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2.9					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length	FL_x	(cm)		3.0	-	-		20.0
		FL_y	(cm)		6.0	-	-		6.0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	143					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	30.0	30.0				30.0
	B-Imagesector angle		(Degree)	68.9	20.0				68.9
	B-Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			norm	norm				norm
	SENS PRI			-	-				-
	B Tx Power		(%)	1	1				1
	CFM Box start		(cm)	7.4	1.1				25.5
	CFM Box end		(cm)	11.9	5.6				30.0
	CFM Box angle		(Degree)	68.9	7.2				68.9
	CFM Tx power		(%)	100	100				100
	Ensemble			7.0	22.0				9.0
	Line Density			1	1				9
	Flow Res			high	high				high
	Velocity Range		(kHz)	0.1	9.0				1.8
	CFM Quality			low	low				high
	CFM Frequency			low	high				high

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'C1-5-RS' **Operating Mode:** Color Flow
SW-Release: Voluson S6 11.0.0.A

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	2.1	3.2	-	-	3.2	-	
Output Power	P	(mW)			-	-		-	262
Bounded output Power	P_1	(mW)		29			29		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.82					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.30					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.6						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	1.8						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			11.8
Equivalent aperture diameter	D_{eq}	(cm)				-			3.9
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	6.9						

A-1-1-24 Tables for C1-5-RS at Color/Motion Mode (CM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'C1-5-RS' **Operating Mode:** cM-Mode
SW-Release: Voluson S6 11.0.0.A

Index Label					MI	TIS			TIB	TIC
						scan	non-scan		non-scan	
							A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value					1.5	1.0	-	-	-	1.7
Assoc. Acoustic Parameter	IEC	FDA		Units						
	$p_{r\alpha}$	$p_{r.3}$		(MPa)	2.2					
	P	W_o		(mW)		137	-		-	137
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]		(mW)				-		
	z_s	z_1		(cm)				-		
	z_{bp}	z_{bp}		(cm)				-		
	z_b	z_{sp}		(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}		(cm)	3.7					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$		(cm)					-	
	f_{awf}	f_c		(MHz)	2.1	2.8	-	-	-	2.8
	Dim of A_{aprt}		X	(cm)		2.4	-	-	-	2.4
			Y	(cm)		1.3	-	-	-	1.3
Other Information	t_d	PD		(µsec)	2.0					
	prr	PRF		(Hz)	150					
	p_r at max. I_{pi}	p_r@PII_{max}		(MPa)	2.9					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}		(cm)					-	
	Focal Length		FL_x	(cm)		20.0	-	-		20.0
			FL_y	(cm)		6.0	-	-		6.0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}		(W/cm²)	211					
Operating Control Conditions	B-Imagesector start			(cm)	0.0	0.0				0.0
	B-Imagesector end			(cm)	30.0	30.0				30.0
	B-Imagesector angle			(Degree)	20	20				20
	B-Quality				low	low				low
	Zoom				1.0	1.0				1.0
	Foc. Zones				1	1				1
	Frequency Setting				norm	norm				norm
	SENS PRI				-	-				-
	B Tx Power			(%)	1	1				1
	Mc Tx Power			(%)	100	100				100
	Ensemble				16	12				12
	Flow Res				high	high				high
	Velocity Range			(kHz)	0.1	0.9				0.9
	Speed				6.0	6.0				6.0
	Mc Frequency				Low	Mid				Mid

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'C1-5-RS' **Operating Mode:** cM-Mode
SW-Release: Voluson S6 11.0.0.A

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	2.1	2.8	-	-	2.1	-	
Output Power	P	(mW)			-	-		-	137
Bounded output Power	P_1	(mW)		75			171		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.72					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.42					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.9						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.2						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			3.1
Equivalent aperture diameter	D_{eq}	(cm)				-			2.0
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	3.7						

A-1-1-25 Tables for 4C-RS at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: '4C-RS' **Operating Mode:** B-Mode
SW-Release: Voluson S6 11.0.0.A

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				1.4	0.8	-	-	-	1.7
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.1					
	P	W_o	(mW)		194	-		-	262
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	4.3					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2.3	5.0	-	-	-	3.1
	Dim of A_{aprt}		X (cm)		5.8	-	-	-	8.5
			Y (cm)		1.3	-	-	-	1.3
Other Information	t_d	PD	(µsec)	0.8					
	prr	PRF	(Hz)	808					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3.0					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		12.0	-	-		7.0
			FL_y (cm)		6.0	-	-		6.0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	271					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	30.1	30.1				30.1
	B-Imagesector angle		(Degree)	20.0	20.0				57.6
	Quality			low	high				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			CPI	-				-
	SENS PRI			11.0	1.0				1.0
	Power		(%)	100	100				100
	ZoomBox start		(cm)	11.3	4.5				0.0
	ZoomBox end		(cm)	14.3	7.5				3.0
	ZoomBox angle		(Degree)	20.0	20.0				57.6
	Mode Type			Contrast	BFlow				BFlow
	Focal Depth		(cm)	5.0	12.0				7.0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: '4C-RS' **Operating Mode:** B-Mode
SW-Release: Voluson S6 11.0.0.A

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	2.3	5.0	-	-	5.0	-	
Output Power	P	(mW)			-	-		-	262
Bounded output Power	P_1	(mW)		33			33		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.43					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.22					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3.0						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.1						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			11.1
Equivalent aperture diameter	D_{eq}	(cm)				-			3.8
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	4.3						

A-1-1-26 Tables for 4C-RS at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: '4C-RS' **Operating Mode:** B+M Mode
SW-Release: Voluson S6 11.0.0.A

Index Label				MI	TIS scan	TIS non-scan $A_{aprt} \le 1$ cm²	TIS non-scan $A_{aprt} > 1$ cm²	TIB non-scan	TIC
Global Maximum Index Value				1.3	0.3	-	-	-	1.0
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.0					
	P	W_o	(mW)		118	-		-	118
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	4.5					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2.5	2.4	-	-	-	2.4
	Dim of A_{aprt}		X (cm)		3.1	-	-	-	3.1
			Y (cm)		1.3	-	-	-	1.3
Other Information	t_d	PD	(µsec)	0.5					
	prr	PRF	(Hz)	900					
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	2.9					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		15.0	-	-		15.0
			FL_y (cm)		6.0	-	-		6.0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	215					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	30.1	30.1				30.1
	B-Imagesector angle		(Degree)	57.6	57.6				57.6
	Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			penet	penet				penet
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	Mode Type			M	M				M
	Focal Depth		(cm)	7.0	15.0				15.0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: '4C-RS' **Operating Mode:** B+M Mode
SW-Release: Voluson S6 11.0.0.A

Index			MI	TIS Scanning	TIS Non-Scanning $A_{aprt} \le 1$ cm²	TIS Non-Scanning $A_{aprt} > 1$ cm²	TIB Scanning	TIB Non-Scanning	TIC
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	2.5	2.4	-	-	2.6	-	
Output Power	P	(mW)			-	-		-	118
Bounded output Power	P_1	(mW)		29			61		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.24					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.11					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.9						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.0						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			4.0
Equivalent aperture diameter	D_{eq}	(cm)				-			2.3
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	4.5						

A-1-1-27 Tables for 4C-RS at Pulsed Wave Doppler (PW-Mode)

Transducer Model: '4C-RS' **Operating Mode:** Pulsed Doppler
SW-Release: Voluson S6 11.0.0.A

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt}\leq 1\ cm^2$	$A_{aprt}>1\ cm^2$		
Global Maximum Index Value				1.3	-	-	0.9	1.7	1.7
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.1					
	P	W_o	(mW)		-	-		127	129
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				68.7		
	z_s	z_1	(cm)				4.1		
	z_{bp}	z_{bp}	(cm)				3.2		
	z_b	z_{sp}	(cm)					4.2	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	4.6					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0.8	
	f_{awf}	f_c	(MHz)	2.6	-	-	2.7	2.3	2.7
	Dim of A_{aprt}		X (cm)		-	-	2.7	2.7	2.1
			Y (cm)		-	-	1.3	1.3	1.3
Other Information	t_d	PD	(µsec)	0.6					
	prr	PRF	(Hz)	901					
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	3.2					
	d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)					0.0	
	Focal Length		FL_x (cm)		-	-	15.0		12.0
			FL_y (cm)		-	-	6.0		6.0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	160					
Operating Control Conditions	Gate width		(cm)	0.1			0.1	0.1	0.3
	Gate pos		(cm)	6.0			9.0	9.0	6.1
	Velocity Range		(kHz)	0.9			3.3	0.9	3.3
	Power		(%)	100			100	100	100

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: '4C-RS' **Operating Mode:** Pulsed Doppler
SW-Release: Voluson S6 11.0.0.A

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt}\leq 1\ cm^2$	$A_{aprt}>1\ cm^2$			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	2.5	-	-	2.7	-	2.3	
Output Power	P	(mW)			-	145		127	129
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				68		64.6	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				265		191	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				113		78	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.30					0.21	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.11					0.09	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.9						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.0						
-12 dB output beam area	A_{aprt}	(cm²)			-	3.5			2.8
Equivalent aperture diameter	D_{eq}	(cm)				2.1			1.9
Depth for *TIS*	z_s	(cm)				4.1			
Depth for *TIB*	z_b	(cm)						4.2	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	4.5						

A-1-1-28 Tables for 4C-5-RS at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: '4C-RS' **Operating Mode:** Color Flow
SW-Release: Voluson S6 11.0.0.A

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt}\le 1\ cm^2$	$A_{aprt}>1\ cm^2$		
Global Maximum Index Value				1.3	0.7	-	-	-	1.7
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.0					
	P	W_o	(mW)		47	-		-	267
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	4.6					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2.3	3.2	-	-	-	3.2
	Dim of A_{aprt}		X (cm)		1.1	-	-	-	8.9
			Y (cm)		1.3	-	-	-	1.3
Other Information	t_d	PD	(µsec)	2.1					
	prr	PRF	(Hz)	1987					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2.8					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		1.5	-	-		15.0
			FL_y (cm)		6.0	-	-		6.0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	154					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	30.1	30.1				30.1
	B-Imagesector angle		(Degree)	57.6	20.0				57.6
	B-Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			penet	penet				penet
	SENS PRI			-	-				-
	B Tx Power		(%)	1	1				1
	CFM Box start		(cm)	6.4	0.0				25.6
	CFM Box end		(cm)	10.9	4.5				30.1
	CFM Box angle		(Degree)	57.6	7.1				57.6
	CFM Tx power		(%)	100	100				100
	Ensemble			7.0	9.0				22.0
	Line Density			1	10				1
	Flow Res			low	low				low
	Velocity Range		(kHz)	5	9.0				1.8
	CFM Quality			low	high				low
	CFM Frequency			low	high				high

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: '4C-RS' **Operating Mode:** Color Flow
SW-Release: Voluson S6 11.0.0.A

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt}\le 1\ cm^2$	$A_{aprt}>1\ cm^2$			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	2.3	3.2	-	-	3.2	-	
Output Power	P	(mW)			-	-		-	267
Bounded output Power	P_1	(mW)		44			44		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.68					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.33					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.8						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.0						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			11.6
Equivalent aperture diameter	D_{eq}	(cm)				-			3.8
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	4.6						

A-1-1-29 Tables for 4C-RS at Color/Motion Mode (CM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: '4C-RS' **Operating Mode:** cM-Mode
SW-Release: Voluson S6 11.0.0.A

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				1.2	0.9	-	-	-	1.7
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.0					
	P	W_o	(mW)		146	-		-	154
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	4.7					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2.7	2.6	-	-	-	2.6
	Dim of A_{aprt}		X (cm)		2.7	-	-	-	2.7
			Y (cm)		1.3	-	-	-	1.3
Other Information	t_d	PD	(µsec)	0.7					
	prr	PRF	(Hz)	150					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3.0					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		15.0	-	-		15.0
			FL_y (cm)		6.0	-	-		6.0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	151					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	30.1	30.1				30.1
	B-Imagesector angle		(Degree)	20	58				20
	B-Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			penet	penet				penet
	SENS PRI			-	-				-
	B Tx Power		(%)	100	1				100
	Mc Tx Power		(%)	100	100				100
	Ensemble			16	12				8
	Flow Res			high	high				high
	Velocity Range		(kHz)	0.1	1.8				0.9
	Speed			6.0	6.0				6.0
	Mc Frequency			Mid	Mid				Mid

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: '4C-RS' **Operating Mode:** cM-Mode
SW-Release: Voluson S6 11.0.0.A

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	2.7	2.6	-	-	2.7	-	
Output Power	P	(mW)			-	-		-	154
Bounded output Power	P_1	(mW)		71			133		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.26					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.11					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3.0						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.0						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			3.5
Equivalent aperture diameter	D_{eq}	(cm)				-			2.1
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	4.7						

A-1-1-30 Tables for E8C-RS at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'E8C-RS' **Operating Mode:** B-Mode
SW-Release: Voluson S6 11.0.0.A

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				1.1	0.3	-	-	-	0.6
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.6					
	P	W_o	(mW)		19	-		-	40
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	1.8					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	5.4	5.8	-	-	-	5.4
	Dim of A_{aprt}		X (cm)		2.0	-	-	-	4.0
			Y (cm)		0.5	-	-	-	0.5
Other Information	t_d	PD	(µsec)	0.3					
	prr	PRF	(Hz)	5017					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3.6					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		1.0	-	-		8.0
			FL_y (cm)		2.8	-	-		2.8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	308					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	16.0	3.0				16.0
	B-Imagesector angle		(Degree)	122.6	122.6				122.6
	Quality			high	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			norm	norm				norm
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	ZoomBox start		(cm)	3.2	1.3				1.6
	ZoomBox end		(cm)	6.4	2.3				4.8
	ZoomBox angle		(Degree)	122.6	73.6				122.6
	Mode Type			B	B				B
	Focal Depth		(cm)	2.0	1.0				8.0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'E8C-RS' **Operating Mode:** B-Mode
SW-Release: Voluson S6 11.0.0.A

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	5.4	5.8	-	-	5.8	-	
Output Power	P	(mW)			-	-		-	40
Bounded output Power	P_1	(mW)		10			10		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.16					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.08					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3.6						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.6						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			2.0
Equivalent aperture diameter	D_{eq}	(cm)				-			1.6
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1.8						

A-1-1-31 Tables for E8C-RS at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'E8C-RS' **Operating Mode:** B+M Mode
SW-Release: Voluson S6 11.0.0.A

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				1.1	0.3	-	-	-	0.5
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.4					
	P	W_o	(mW)		26	-		-	26
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	0.9					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	4.6	5.4	-	-	-	5.4
	Dim of A_{aprt}		X (cm)		1.6	-	-	-	1.6
			Y (cm)		0.5	-	-	-	0.5
Other Information	t_d	PD	(µsec)	0.2					
	prr	PRF	(Hz)	900					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2.6					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		8.0	-	-		8.0
			FL_y (cm)		2.8	-	-		2.8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	244					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	16.0	16.0				16.0
	B-Imagesector angle		(Degree)	122.6	122.6				122.6
	Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			penet	norm				norm
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	Mode Type			M	M				M
	Focal Depth		(cm)	1.0	8.0				8.0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'E8C-RS' **Operating Mode:** B+M Mode
SW-Release: Voluson S6 11.0.0.A

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	4.6	5.4	-	-	4.4	-	
Output Power	P	(mW)			-	-		-	26
Bounded output Power	P_1	(mW)		12			16		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.08					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.06					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.6						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.4						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			0.8
Equivalent aperture diameter	D_{eq}	(cm)				-			1.0
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	0.9						

A-1-1-32 Tables for E8C-RS at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'E8C-RS' **Operating Mode:** Pulsed Doppler
SW-Release: Voluson S6 11.0.0.A

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				1.1	-	0.9	-	0.8	0.9
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.3					
	P	W_o	(mW)		-	29		29	33
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					1.4	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	2.1					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0.5	
	f_{awf}	f_c	(MHz)	4.7	-	6.5	-	4.7	5.8
	Dim of A_{aprt}		X (cm)		-	1.4	-	1.4	1.4
			Y (cm)		-	0.5	-	0.5	0.5
Other Information	t_d	PD	(µsec)	0.6					
	prr	PRF	(Hz)	901					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3.2					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					0.0	
	Focal Length		FL_x (cm)		-	8.0	-		8.0
			FL_y (cm)		-	2.8	-		2.8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	223					
Operating Control Conditions	Gate width		(cm)	0.1		0.3		0.4	0.3
	Gate pos		(cm)	0.0		4.8		4.9	4.8
	Velocity Range		(kHz)	0.9		3.3		7.0	1.3
	Power		(%)	100		100		100	100

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'E8C-RS' **Operating Mode:** Pulsed Doppler
SW-Release: Voluson S6 11.0.0.A

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	4.7	-	6.5	-	-	4.7	
Output Power	P	(mW)			29	-		29	33
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				-		18.6	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		125	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		68	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.26					0.02	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.13					0.01	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3.2						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.3						
-12 dB output beam area	A_{aprt}	(cm²)			0.7	-			0.7
Equivalent aperture diameter	D_{eq}	(cm)				-			1.0
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						1.4	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	2.1						

A-1-1-33 Tables for E8C-RS at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'E8C-RS' **Operating Mode:** Color Flow
SW-Release: Voluson S6 11.0.0.A

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				1.1	0.4	-	-	-	0.7
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.5					
	P	W_o	(mW)		46	-		-	47
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	2.1					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	4.7	6.5	-	-	-	5.6
	Dim of A_{aprt}	X	(cm)		3.8	-	-	-	3.8
		Y	(cm)		0.5	-	-	-	0.5
Other Information	t_d	PD	(µsec)	1.0					
	prr	PRF	(Hz)	873					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3.3					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length	FL_x	(cm)		8.0	-	-		8.0
		FL_y	(cm)		2.8	-	-		2.8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	228					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	16.0	16.0				16.0
	B-Imagesector angle		(Degree)	122.6	122.6				122.6
	B-Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			resol	resol				resol
	SENS PRI			-	-				-
	B Tx Power		(%)	1	1				1
	CFM Box start		(cm)	0.6	4.5				10.7
	CFM Box end		(cm)	3.0	6.9				13.1
	CFM Box angle		(Degree)	122.6	122.6				122.6
	CFM Tx power		(%)	100	100				100
	Ensemble			7.0	22.0				8.0
	Line Density			1	1				10
	Flow Res			low	low				high
	Velocity Range		(kHz)	0.1	0.1				4.0
	CFM Quality			low	low				low
	CFM Frequency			low	high				mid

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'E8C-RS' **Operating Mode:** Color Flow
SW-Release: Voluson S6 11.0.0.A

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	4.7	6.5	-	-	6.5	-	
Output Power	P	(mW)			-	-		-	47
Bounded output Power	P_1	(mW)		12			12		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.56					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.28					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3.3						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.5						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			1.9
Equivalent aperture diameter	D_{eq}	(cm)				-			1.6
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	2.1						

A-1-1-34 Tables for E8C-RS at Color/Motion Mode (CM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'E8C-RS' **Operating Mode:** cM-Mode
SW-Release: Voluson S6 11.0.0.A

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1\ cm^2$	$A_{aprt} > 1\ cm^2$		
Global Maximum Index Value				1.1	0.9	-	-	-	0.9
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.5					
	P	W_o	(mW)		30	-		-	32
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	1.8					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	4.7	6.4	-	-	-	5.6
	Dim of A_{aprt}		X (cm)		1.4	-	-	-	1.4
			Y (cm)		0.5	-	-	-	0.5
Other Information	t_d	PD	(µsec)	0.6					
	prr	PRF	(Hz)	150					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3.3					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		8.0	-	-		8.0
			FL_y (cm)		2.8	-	-		2.8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	157					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	16.0	16.0				16.0
	B-Imagesector angle		(Degree)	20	123				123
	B-Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			resol	resol				resol
	SENS PRI			-	-				-
	B Tx Power		(%)	93	1				1
	Mc Tx Power		(%)	100	100				100
	Ensemble			16	16				12
	Flow Res			high	high				high
	Velocity Range		(kHz)	0.1	2.4				3.2
	Speed			6.0	6.0				6.0
	Mc Frequency			Low	High				Mid

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'E8C-RS' **Operating Mode:** cM-Mode
SW-Release: Voluson S6 11.0.0.A

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \le 1\ cm^2$	$A_{aprt} > 1\ cm^2$			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	4.7	6.4	-	-	4.7	-	
Output Power	P	(mW)			-	-		-	32
Bounded output Power	P_1	(mW)		30			34		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.16					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.09					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3.3						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.5						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			0.7
Equivalent aperture diameter	D_{eq}	(cm)				-			1.0
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1.8						

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Table A-2 Tables for Transducers at different Operating Modes

Table A-2 Tables for Transducers at different Operating Modes

A-1-2-1 Tables for 12L-RS at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: '12L-RS' **Operating Mode:** B-Mode
SW-Release: Voluson S8 11.0.0

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1\ cm^2$	$A_{aprt} > 1\ cm^2$		
Global Maximum Index Value				1.2	0.9	-	-	-	1.7
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3.2					
	P	W_o	(mW)		71	-		-	104
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	1.6					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	6.5	7.4	-	-	-	6.5
	Dim of A_{aprt}		X (cm)		2.9	-	-	-	4.4
			Y (cm)		0.4	-	-	-	0.4
Other Information	t_d	PD	(µsec)	1.4					
	prr	PRF	(Hz)	6896					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	4.4					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		1.6	-	-		1.6
			FL_y (cm)		1.3	-	-		1.3
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	513					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	8.0	8.0				2.0
	B-Imagesector width		(cm)	3.7	3.7				3.7
	Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			-	norm				-
	SENS PRI			1.0	-				1.0
	Power		(%)	100	100				100
	ZoomBox start		(cm)	6.1	5.9				0.5
	ZoomBox end		(cm)	7.7	7.5				1.5
	ZoomBox width		(cm)	3.7	2.3				3.7
	Mode Type			BFlow	B(CE)				BFlow
	Focal Depth		(cm)	1.6	1.6				1.6

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: '12L-RS' **Operating Mode:** B-Mode
SW-Release: Voluson S8 11.0.0

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \le 1\ cm^2$	$A_{aprt} > 1\ cm^2$			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	6.5	7.4	-	-	7.4	-	
Output Power	P	(mW)			-	-		-	104
Bounded output Power	P_1	(mW)		24			24		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	1.42					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.70					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	4.4						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3.2						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			1.7
Equivalent aperture diameter	D_{eq}	(cm)				-			1.5
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1.6						

A-1-2-2 Tables for 12L-RS at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: '12L-RS' **Operating Mode:** B+M Mode
SW-Release: Voluson S8 11.0.0

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1$ cm²	$A_{aprt} > 1$ cm²		
Global Maximum Index Value				1.5	0.8	-	-	-	1.5
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3.6					
	P	W_o	(mW)		85	-		-	85
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	0.7					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	5.8	5.7	-	-	-	5.7
	Dim of A_{aprt}		X (cm)		1.4	-	-	-	1.4
			Y (cm)		0.4	-	-	-	0.4
Other Information	t_d	PD	(µsec)	0.3					
	prr	PRF	(Hz)	450					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	4.1					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		5.0	-	-		5.0
			FL_y (cm)		1.3	-	-		1.3
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	526					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	8.0	8.0				8.0
	B-Imagesector width		(cm)	3.7	3.7				3.7
	Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			resol	resol				resol
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	Mode Type			M(Harm)	M(Harm)				M(Harm)
	Focal Depth		(cm)	0.9	5.0				5.0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: '12L-RS' **Operating Mode:** B+M Mode
SW-Release: Voluson S8 11.0.0

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \le 1$ cm²	$A_{aprt} > 1$ cm²			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	5.8	5.7	-	-	5.7	-	
Output Power	P	(mW)			-	-		-	85
Bounded output Power	P_1	(mW)		28			19		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.18					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.13					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	4.1						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3.6						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			0.6
Equivalent aperture diameter	D_{eq}	(cm)				-			0.9
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	0.7						

A-1-2-3 Tables for 12L-RS at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: '12L-RS' **Operating Mode:** Pulsed Doppler
SW-Release: Voluson S8 11.0.0

Index Label				MI	TIS scan	TIS non-scan $A_{aprt} \le 1$ cm²	TIS non-scan $A_{aprt} > 1$ cm²	TIB non-scan	TIC
Global Maximum Index Value				1.4	-	1.7	-	1.7	1.7
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3.7					
	P	W_o	(mW)		-	50		37	50
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					1.1	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	0.9					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0.3	
	f_{awf}	f_c	(MHz)	6.5	-	7.0	-	5.3	7.0
	Dim of A_{aprt}		X (cm)		-	1.0	-	1.0	1.0
			Y (cm)		-	0.4	-	0.4	0.4
Other Information	t_d	PD	(µsec)	0.2					
	prr	PRF	(Hz)	901					
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	4.5					
	d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)					0.0	
	Focal Length		FL_x (cm)		-	6.0	-		6.0
			FL_y (cm)		-	1.3	-		1.3
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	484					
Operating Control Conditions	Gate width		(cm)	0.1		0.7		0.3	0.7
	Gate pos		(cm)	0.0		3.3		3.2	3.3
	Velocity Range		(kHz)	0.9		3.3		3.3	3.3
	Power		(%)	100		100		100	100

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: '12L-RS' **Operating Mode:** Pulsed Doppler
SW-Release: Voluson S8 11.0.0

Index			MI	TIS Scanning	TIS Non-Scanning $A_{aprt} \le 1$ cm²	TIS Non-Scanning $A_{aprt} > 1$ cm²	TIB Scanning	TIB Non-Scanning	TIC
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	6.5	-	7.0	-	-	5.3	
Output Power	P	(mW)			50	-		37	50
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				-		25.0	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		355	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		238	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.18					0.11	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.12					0.07	
Peak-rarefactional acoustic pressure	p_r	(MPa)	4.5						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3.7						
-12 dB output beam area	A_{aprt}	(cm²)			0.4	-			0.4
Equivalent aperture diameter	D_{eq}	(cm)				-			0.7
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						1.1	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	0.9						

A-1-2-4 Tables for 12L-RS at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: '12L-RS' **Operating Mode:** Color Flow
SW-Release: Voluson S8 11.0.0

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				1.5	1.0	-	-	-	1.7
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3.7					
	P	W_o	(mW)		49	-		-	101
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	0.9					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	6.2	7.0	-	-	-	7.0
	Dim of A_{aprt}		X (cm)		1.6	-	-	-	4.1
			Y (cm)		0.4	-	-	-	0.4
Other Information	t_d	PD	(µsec)	1.0					
	prr	PRF	(Hz)	6846					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	4.5					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		6.0	-	-		2.0
			FL_y (cm)		1.3	-	-		1.3
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	503					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	8.0	8.0				8.0
	B-Imagesector width		(cm)	3.7	3.7				3.7
	B-Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			2	2				2
	Frequency Setting			resol	resol				resol
	SENS PRI			-	-				-
	B Tx Power		(%)	1	1				1
	CFM Box start		(cm)	0.0	3.4				0.0
	CFM Box end		(cm)	1.2	4.6				1.2
	CFM Box width		(cm)	3.7	0.6				3.7
	CFM Tx power		(%)	100	100				100
	Ensemble			22.0	9.0				10.0
	Line Density			1	2				9
	Flow Res			low	low				low
	Velocity Range		(kHz)	18	0.1				18.0
	CFM Quality			low	high				low
	CFM Frequency			mid	high				high

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: '12L-RS' **Operating Mode:** Color Flow
SW-Release: Voluson S8 11.0.0

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	6.2	7.0	-	-	7.0	-	
Output Power	P	(mW)			-	-		-	101
Bounded output Power	P_1	(mW)		31			31		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.70					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.48					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	4.5						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3.7						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			1.6
Equivalent aperture diameter	D_{eq}	(cm)				-			1.4
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	0.9						

A-1-2-5 Tables for RAB4-8-RS at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'RAB4-8-RS' **Operating Mode:** B-Mode
SW-Release: Voluson S8 11.0 TestMizar

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				1.1	0.3	-	-	-	1.0
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	1.8					
	P	W_o	(mW)		67	-		-	130
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	3.0					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2.7	3.6	-	-	-	3.6
	Dim of A_{aprt}		X (cm)		3.8	-	-	-	7.4
			Y (cm)		1.1	-	-	-	1.1
Other Information	t_d	PD	(µsec)	0.7					
	prr	PRF	(Hz)	4545					
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	2.3					
	d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		3.0	-	-		11.0
			FL_y (cm)		6.3	-	-		6.3
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	171					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	26.0	3.0				3.0
	B-Imagesector angle		(Degree)	70.0	70.0				70.0
	Quality			high	high				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			Low	-				-
	SENS PRI			-	15.0				15.0
	Power		(%)	100	100				100
	ZoomBox start		(cm)	7.8	0.8				0.8
	ZoomBox end		(cm)	13.0	2.8				2.8
	ZoomBox angle		(Degree)	70.0	42.5				70.0
	Mode Type			B(Harm)	BFlow				BFlow
	Focal Depth		(cm)	3.0	3.0				11.0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'RAB4-8-RS' **Operating Mode:** B-Mode
SW-Release: Voluson S8 11.0 TestMizar

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	2.7	3.6	-	-	3.6	-	
Output Power	P	(mW)			-	-		-	130
Bounded output Power	P_1	(mW)		18			18		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.22					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.13					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.3						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	1.8						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			8.2
Equivalent aperture diameter	D_{eq}	(cm)				-			3.2
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	3.0						

A-1-2-6 Tables for RAB4-8-RS at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'RAB4-8-RS' **Operating Mode:** B+M Mode
SW-Release: Voluson S8 11.0 TestMizar

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				1.3	0.3	-	-	-	0.8
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.3					
	P	W_o	(mW)		77	-		-	77
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	3.4					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	3.0	2.7	-	-	-	2.7
	Dim of A_{aprt}		X (cm)		2.0	-	-	-	2.0
			Y (cm)		1.3	-	-	-	1.3
Other Information	t_d	PD	(µsec)	0.5					
	prr	PRF	(Hz)	900					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3.3					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		12.0	-	-		12.0
			FL_y (cm)		6.3	-	-		6.3
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	243					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	26.0	26.0				26.0
	B-Imagesector angle		(Degree)	70.0	70.0				70.0
	Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			norm	penet				penet
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	Mode Type			M	M				M
	Focal Depth		(cm)	6.0	12.0				12.0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'RAB4-8-RS' **Operating Mode:** B+M Mode
SW-Release: Voluson S8 11.0 TestMizar

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	3.0	2.7	-	-	2.7	-	
Output Power	P	(mW)			-	-		-	77
Bounded output Power	P_1	(mW)		23			59		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.23					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.11					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3.3						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.3						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			2.5
Equivalent aperture diameter	D_{eq}	(cm)				-			1.8
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	3.3						

A-1-2-7 Tables for RAB4-8-RS at Pulsed Wave Doppler (PW-Mode)

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'RAB4-8-RS' **Operating Mode:** Pulsed Doppler
SW-Release: Voluson S8 11.0 TestMizar

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	3.0	-	-	2.9	-	3.0	
Output Power	P	(mW)			-	63		45	63
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				41		22.7	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				570		619	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				250		300	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.50					0.28	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.26					0.14	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3.2						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.3						
-12 dB output beam area	A_{aprt}	(cm²)			-	1.5			1.5
Equivalent aperture diameter	D_{eq}	(cm)				1.4			1.4
Depth for *TIS*	z_s	(cm)				2.1			
Depth for *TIB*	z_b	(cm)						3.4	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	3.2						

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'RAB4-8-RS' **Operating Mode:** Pulsed Doppler
SW-Release: Voluson S8 11.0.0 Mizar Test

Index Label				MI	TIS	TIS	TIS	TIB	TIC
					scan	non-scan	non-scan	non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				1.3	-	-	0.6	1.7	1.1
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.3					
	P	W_o	(mW)		-	-		45	63
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				41.1		
	z_s	z_1	(cm)				2.1		
	z_{bp}	z_{bp}	(cm)				2.1		
	z_b	z_{sp}	(cm)					3.4	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	3.2					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0.3	
	f_{awf}	f_c	(MHz)	3.0	-	-	2.9	3.0	2.9
	Dim of A_{aprt}		X (cm)		-	-	1.2	0.9	1.2
			Y (cm)		-	-	1.3	1.3	1.3
Other Information	t_d	PD	(µsec)	1.2					
	prr	PRF	(Hz)	901					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3.2					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					0.0	
	Focal Length		FL_x (cm)		-	-	11.0		11.0
			FL_y (cm)		-	-	6.3		6.3
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	212					
Operating Control Conditions	Gate width		(cm)	0.1			0.1	0.1	0.1
	Gate pos		(cm)	5.2			7.8	5.2	7.8
	Velocity Range		(kHz)	0.9			1.3	2.2	1.3
	Power		(%)	100			100	100	100

A-1-2-8 Tables for RAB4-8-RSD at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'RAB4-8-RS' **Operating Mode:** Color Flow
SW-Release: Voluson S8 11.0 TestMizar

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				1.3	0.4	-	-	-	1.2
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.2					
	P	W_o	(mW)		122	-		-	148
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	1.4					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	3.0	3.4	-	-	-	3.0
	Dim of A_{aprt}		X (cm)		5.4	-	-	-	6.1
			Y (cm)		1.3	-	-	-	1.3
Other Information	t_d	PD	(µsec)	2.2					
	prr	PRF	(Hz)	1262					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2.5					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		4.5	-	-		11.0
			FL_y (cm)		6.3	-	-		6.3
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	208					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	26.0	26.0				26.0
	B-Imagesector angle		(Degree)	70.0	70.0				70.0
	B-Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			norm	norm				norm
	SENS PRI			-	-				-
	B Tx Power		(%)	1	1				1
	CFM Box start		(cm)	0.9	1.8				12.9
	CFM Box end		(cm)	4.8	5.7				16.8
	CFM Box angle		(Degree)	70.0	70.0				70.0
	CFM Tx power		(%)	100	100				100
	Ensemble			7.0	7.0				9.0
	Line Density			1	1				2
	Flow Res			high	high				high
	Velocity Range		(kHz)	0.1	7.5				3.2
	CFM Quality			low	low				high
	CFM Frequency			low	mid				low

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'RAB4-8-RS' **Operating Mode:** Color Flow
SW-Release: Voluson S8 11.0 TestMizar

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	3.0	3.4	-	-	3.4	-	
Output Power	P	(mW)			-	-		-	148
Bounded output Power	P_1	(mW)		22			22		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.62					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.46					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.5						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.2						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			8.0
Equivalent aperture diameter	D_{eq}	(cm)				-			3.2
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1.4						

A-1-2-9 Tables for RAB4-8-RS at Color/Motion Mode (CM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'RAB4-8-RS' **Operating Mode:** cM-Mode
SW-Release: Voluson S8 11.0 TestMizar

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1$ cm²	$A_{aprt} > 1$ cm²		
Global Maximum Index Value				1.3	0.6	-	-	-	1.1
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.2					
	P	W_o	(mW)		63	-		-	63
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	1.4					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	3.0	3.0	-	-	-	3.0
	Dim of A_{aprt}		X (cm)		1.2	-	-	-	1.2
			Y (cm)		1.3	-	-	-	1.3
Other Information	t_d	PD	(µsec)	2.2					
	prr	PRF	(Hz)	150					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2.2					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		11.0	-	-		11.0
			FL_y (cm)		6.3	-	-		6.3
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	208					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	26.0	26.0				26.0
	B-Imagesector angle		(Degree)	20	20				20
	B-Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			norm	norm				norm
	SENS PRI			-	-				-
	B Tx Power		(%)	1	1				1
	Mc Tx Power		(%)	100	100				100
	Ensemble			16	8				8
	Flow Res			high	high				high
	Velocity Range		(kHz)	0.1	1.3				1.3
	Speed			6.0	6.0				6.0
	Mc Frequency			Low	Low				Low

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'RAB4-8-RS' **Operating Mode:** cM-Mode
SW-Release: Voluson S8 11.0 TestMizar

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \le 1$ cm²	$A_{aprt} > 1$ cm²			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	3.0	3.0	-	-	3.0	-	
Output Power	P	(mW)			-	-		-	63
Bounded output Power	P_1	(mW)		41			121		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.62					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.46					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.5						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.2						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			1.5
Equivalent aperture diameter	D_{eq}	(cm)				-			1.4
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1.4						

A-1-2-10 Tables for RIC5-9W-RS at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'RIC5-9W-RS' **Operating Mode:** B-Mode
SW-Release: Voluson S8 11.0.0

Index Label				MI	TIS scan	TIS non-scan $A_{aprt} \le 1\ cm^2$	TIS non-scan $A_{aprt} > 1\ cm^2$	TIB non-scan	TIC
Global Maximum Index Value				1.3	0.2	-	-	-	0.3
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.5					
	P	W_o	(mW)		6	-		-	23
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	0.1					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	3.8	8.8	-	-	-	5.0
	Dim of A_{aprt}		X (cm)		1.1	-	-	-	4.2
			Y (cm)		0.6	-	-	-	0.6
Other Information	t_d	PD	(µsec)	0.5					
	prr	PRF	(Hz)	2484					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2.9					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		4.0	-	-		8.0
			FL_y (cm)		3.5	-	-		3.5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	248					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	16.0	16.0				16.0
	B-Imagesector angle		(Degree)	146.3	20.0				146.3
	Quality			high	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			Low	-				-
	SENS PRI			-	15.0				15.0
	Power		(%)	100	100				100
	ZoomBox start		(cm)	3.2	2.7				11.9
	ZoomBox end		(cm)	6.4	5.7				14.9
	ZoomBox angle		(Degree)	146.3	15.0				146.3
	Mode Type			B(Harm)	BFlow				BFlow
	Focal Depth		(cm)	1.0	4.0				8.0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'RIC5-9W-RS' **Operating Mode:** B-Mode
SW-Release: Voluson S8 11.0.0

Index			MI	TIS Scanning	TIS Non-Scanning $A_{aprt} \le 1\ cm^2$	TIS Non-Scanning $A_{aprt} > 1\ cm^2$	TIB Scanning	TIB Non-Scanning	TIC
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	3.8	8.8	-	-	8.8	-	
Output Power	P	(mW)			-	-		-	23
Bounded output Power	P_1	(mW)		6			6		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.16					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.12					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.9						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.5						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			2.5
Equivalent aperture diameter	D_{eq}	(cm)				-			1.8
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1.0						

A-1-2-11 Tables for RIC5-9W-RS at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'RIC5-9W-RS' **Operating Mode:** B+M Mode
SW-Release: Voluson S8 11.0.0

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				1.1	0.2	-	-	-	0.3
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3.3					
	P	W_o	(mW)		15	-		-	15
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	0.2					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	4.2	5.9	-	-	-	5.5
	Dim of A_{aprt}		X (cm)		1.0	-	-	-	1.0
			Y (cm)		0.6	-	-	-	0.6
Other Information	t_d	PD	(µsec)	0.3					
	prr	PRF	(Hz)	450					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2.8					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		6.5	-	-		6.5
			FL_y (cm)		3.5	-	-		3.5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	252					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	16.0	16.0				16.0
	B-Imagesector angle		(Degree)	146.3	146.3				146.3
	Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			resol	resol				norm
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	Mode Type			M(Harm)	M				M
	Focal Depth		(cm)	3.0	6.5				6.5

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'RIC5-9W-RS' **Operating Mode:** B+M Mode
SW-Release: Voluson S8 11.0.0

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	4.2	5.9	-	-	3.8	-	
Output Power	P	(mW)			-	-		-	15
Bounded output Power	P_1	(mW)		7			13		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.13					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.08					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.8						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.2						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			0.6
Equivalent aperture diameter	D_{eq}	(cm)				-			0.9
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1.7						

A-1-2-12 Tables for RIC5-9W-RS at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'RIC5-9W-RS' **Operating Mode:** Pulsed Doppler
SW-Release: Voluson S8 11.0.0

Index Label				MI	TIS scan	TIS non-scan $A_{aprt} \le 1\ cm^2$	TIS non-scan $A_{aprt} > 1\ cm^2$	TIB non-scan	TIC
Global Maximum Index Value				1.0	-	0.6	-	0.6	0.6
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.4					
	P	W_o	(mW)		-	21		20	21
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					1.8	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	0.2					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0.4	
	f_{awf}	f_c	(MHz)	5.7	-	6.0	-	5.5	6.0
	Dim of A_{aprt}		X (cm)		-	1.0	-	1.0	1.0
			Y (cm)		-	0.6	-	0.6	0.6
Other Information	t_d	PD	(µsec)	0.4					
	prr	PRF	(Hz)	901					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3.4					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					0.0	
	Focal Length		FL_x (cm)		-	8.0	-		8.0
			FL_y (cm)		-	3.5	-		3.5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	186					
Operating Control Conditions	Gate width		(cm)	0.1		0.2		0.4	0.2
	Gate pos		(cm)	0.0		4.8		4.9	4.8
	Velocity Range		(kHz)	0.9		1.3		1.3	1.3
	Power		(%)	100		100		100	100

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'RIC5-9W-RS' **Operating Mode:** Pulsed Doppler
SW-Release: Voluson S8 11.0.0

Index			MI	TIS Scanning	TIS Non-Scanning $A_{aprt} \le 1\ cm^2$	TIS Non-Scanning $A_{aprt} > 1\ cm^2$	TIB Scanning	TIB Non-Scanning	TIC
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	5.7	-	6.0	-	-	5.5	
Output Power	P	(mW)			21	-		20	21
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				-		10.3	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		243	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		121	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.14					0.19	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.07					0.09	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3.4						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.4						
-12 dB output beam area	A_{aprt}	(cm²)			0.6	-			0.6
Equivalent aperture diameter	D_{eq}	(cm)				-			0.9
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						1.8	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1.7						

A-1-2-13 Tables for RIC5-9W-RS at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'RIC5-9W-RS' **Operating Mode:** Color Flow
SW-Release: Voluson S8 11.0.0

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1\ cm^2$	$A_{aprt} > 1\ cm^2$		
Global Maximum Index Value				1.0	0.2	-	-	-	0.4
	IEC	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.3					
	P	W_o	(mW)		23	-		-	28
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
Assoc. Acoustic Parameter	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	0.7					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	5.0	6.1	-	-	-	6.0
	Dim of A_{aprt}		X (cm)		3.2	-	-	-	3.9
			Y (cm)		0.6	-	-	-	0.6
	t_d	PD	(µsec)	1.4					
	prr	PRF	(Hz)	1448					
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	2.6					
Other Information	d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		1.0	-	-		8.0
			FL_y (cm)		3.5	-	-		3.5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	190					
	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	16.0	16.0				16.0
	B-Imagesector angle		(Degree)	146.3	146.3				146.3
	B-Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
Operating Control Conditions	Frequency Setting			norm	norm				norm
	SENS PRI			-	-				-
	B Tx Power		(%)	1	1				1
	CFM Box start		(cm)	0.0	0.0				10.2
	CFM Box end		(cm)	2.4	2.4				12.6
	CFM Box angle		(Degree)	146.3	146.3				146.3
	CFM Tx power		(%)	100	100				100
	Ensemble			7.0	22.0				9.0
	Line Density			1	1				2
	Flow Res			low	low				low
	Velocity Range		(kHz)	0.1	13.0				4.0
	CFM Quality			low	low				high
	CFM Frequency			low	high				high

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'RIC5-9W-RS' **Operating Mode:** Color Flow
SW-Release: Voluson S8 11.0.0

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \le 1\ cm^2$	$A_{aprt} > 1\ cm^2$			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	5.0	6.1	-	-	6.1	-	
Output Power	P	(mW)			-	-		-	28
Bounded output Power	P_1	(mW)		7			7		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.33					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.26					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.6						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.3						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			2.4
Equivalent aperture diameter	D_{eq}	(cm)				-			1.7
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	0.7						

A-1-2-14 Tables for RIC5-9W-RS at Color/Motion Mode (CM-Mode)

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'RIC5-9W-RS' **Operating Mode:** cM-Mode
SW-Release: Voluson S8 11.0.0

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	5.5	6.0	-	-	5.5	-	
Output Power	P	(mW)			-	-		-	22
Bounded output Power	P_1	(mW)		22			23		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.21					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.13					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3.0						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.3						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			0.6
Equivalent aperture diameter	D_{eq}	(cm)				-			0.9
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1.2						

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'RIC5-9W-RS' **Operating Mode:** cM-Mode
SW-Release: Voluson S8 11.0.0

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				1.0	0.6	-	-	-	0.6
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.3					
	P	W_o	(mW)		22	-		-	22
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	1.2					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	5.5	6.0	-	-	-	6.0
	Dim of A_{aprt}		X (cm)		1.0	-	-	-	1.0
			Y (cm)		0.6	-	-	-	0.6
Other Information	t_d	PD	(µsec)	0.9					
	prr	PRF	(Hz)	150					
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	3.0					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		8.0	-	-		8.0
			FL_y (cm)		3.5	-	-		3.5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	146					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	16.0	16.0				16.0
	B-Imagesector angle		(Degree)	20	146				146
	B-Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			norm	norm				norm
	SENS PRI			-	-				-
	B Tx Power		(%)	90	1				1
	Mc Tx Power		(%)	100	100				100
	Ensemble			16	12				12
	Flow Res			high	high				high
	Velocity Range		(kHz)	0.1	2.4				2.4
	Speed			6.0	6.0				6.0
	Mc Frequency			Mid	High				High

A-1-2-15 Tables for AB2-7-RS at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'AB2-7-RS' **Operating Mode:** B-Mode
SW-Release: Voluson S8 11.0.0.A

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				1.1	0.4	-	-	-	1.6
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	1.8					
	P	W_o	(mW)		90	-		-	233
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	5.5					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2.8	3.1	-	-	-	3.0
	Dim of A_{aprt}		X (cm)		3.1	-	-	-	8.0
			Y (cm)		1.3	-	-	-	1.3
Other Information	t_d	PD	(µsec)	0.5					
	prr	PRF	(Hz)	5703					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2.9					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		12.0	-	-		15.0
			FL_y (cm)		7.0	-	-		7.0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	120					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	28.0	4.0				4.0
	B-Imagesector angle		(Degree)	80.0	80.0				80.0
	Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			penet	-				-
	SENS PRI			-	1.0				1.0
	Power		(%)	100	100				100
	ZoomBox start		(cm)	2.8	0.9				0.3
	ZoomBox end		(cm)	8.4	3.4				2.8
	ZoomBox angle		(Degree)	80.0	16.0				80.0
	Mode Type			B	BFlow				BFlow
	Focal Depth		(cm)	7.0	12.0				15.0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'AB2-7-RS' **Operating Mode:** B-Mode
SW-Release: Voluson S8 11.0.0.A

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	2.8	3.1	-	-	3.1	-	
Output Power	P	(mW)			-	-		-	233
Bounded output Power	P_1	(mW)		29			29		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.21					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.07					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3.1						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	1.8						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			10.4
Equivalent aperture diameter	D_{eq}	(cm)				-			3.6
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	5.5						

A-1-2-16 Tables for AB2-7-RS at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'AB2-7-RS' **Operating Mode:** B+M Mode
SW-Release: Voluson S8 11.0.0.A

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$ cm²	$A_{aprt} > 1$ cm²		
Global Maximum Index Value				1.2	0.4	-	-	-	1.2
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.0					
	P	W_o	(mW)		116	-		-	116
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	5.1					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2.8	2.5	-	-	-	2.5
	Dim of A_{aprt}	X	(cm)		2.0	-	-	-	2.0
		Y	(cm)		1.3	-	-	-	1.3
Other Information	t_d	PD	(µsec)	0.5					
	prr	PRF	(Hz)	900					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3.4					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length	FL_x	(cm)		13.0	-	-		13.0
		FL_y	(cm)		7.0	-	-		7.0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	166					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	28.0	28.0				28.0
	B-Imagesector angle		(Degree)	80.0	80.0				80.0
	Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			penet	penet				penet
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	Mode Type			M	M(Harm)				M(Harm)
	Focal Depth		(cm)	7.0	13.0				13.0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'AB2-7-RS' **Operating Mode:** B+M Mode
SW-Release: Voluson S8 11.0.0.A

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \leq 1$ cm²	$A_{aprt} > 1$ cm²			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	2.8	2.5	-	-	2.5	-	
Output Power	P	(mW)			-	-		-	116
Bounded output Power	P_1	(mW)		35			86		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.22					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.08					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3.4						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.0						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			2.6
Equivalent aperture diameter	D_{eq}	(cm)				-			1.8
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	5.1						

A-1-2-17 Tables for AB2-7-RS at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'AB2-7-RS' **Operating Mode:** Pulsed Doppler
SW-Release: Voluson S8 11.0.0.A

Index Label				MI	TIS scan	TIS non-scan $A_{aprt} \le 1$ cm²	TIS non-scan $A_{aprt} > 1$ cm²	TIB non-scan	TIC
Global Maximum Index Value				1.1	-	-	0.9	1.7	1.7
	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	1.8					
	P	W_o	(mW)		-	-		57	119
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				57.0		
Assoc.	z_s	z_1	(cm)				2.1		
Acoustic	z_{bp}	z_{bp}	(cm)				2.0		
Parameter	z_b	z_{sp}	(cm)					2.0	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	4.6					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0.5	
	f_{awf}	f_c	(MHz)	2.7	-	-	3.2	3.0	4.0
	Dim of A_{aprt}		X (cm)		-	-	1.1	0.6	1.8
			Y (cm)		-	-	1.3	1.3	1.3
	t_d	PD	(µsec)	0.9					
	prr	PRF	(Hz)	901					
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	2.8					
Other	d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)					0.0	
Information	Focal Length		FL_x (cm)		-	-	9.0		15.0
			FL_y (cm)		-	-	7.0		7.0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	146					
Operating	Gate width		(cm)	0.1			0.1	0.1	0.3
Control	Gate pos		(cm)	2.8			5.6	0.0	8.5
Conditions	Velocity Range		(kHz)	0.9			1.3	1.3	0.9
	Power		(%)	100			100	100	100

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'AB2-7-RS' **Operating Mode:** Pulsed Doppler
SW-Release: Voluson S8 11.0.0.A

Index			MI	TIS Scanning	TIS Non-Scanning $A_{aprt} \le 1$ cm²	TIS Non-Scanning $A_{aprt} > 1$ cm²	TIB Scanning	TIB Non-Scanning	TIC
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	2.7	-	-	3.2	-	3.0	
Output Power	P	(mW)			-	93		57	119
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				59		38.2	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				416		185	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				149		121	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.31					0.14	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.13					0.09	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.8						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	1.8						
-12 dB output beam area	A_{aprt}	(cm²)			-	1.4			2.3
Equivalent aperture diameter	D_{eq}	(cm)				1.4			1.7
Depth for *TIS*	z_s	(cm)				2.1			
Depth for *TIB*	z_b	(cm)						2.0	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	4.6						

A-1-2-18 Tables for AB2-7-RS at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'AB2-7-RS' **Operating Mode:** Color Flow
SW-Release: Voluson S8 11.0.0.A

Index Label				MI	TIS scan	TIS non-scan $A_{aprt} \le 1\ cm^2$	TIS non-scan $A_{aprt} > 1\ cm^2$	TIB non-scan	TIC
Global Maximum Index Value				1.1	0.8	-	-	-	1.7
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	1.8					
	P	W_o	(mW)		58	-		-	244
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	4.5					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2.7	3.2	-	-	-	4.0
	Dim of A_{aprt}		X (cm)		1.1	-	-	-	7.5
			Y (cm)		1.3	-	-	-	1.3
Other Information	t_d	PD	(µsec)	0.9					
	prr	PRF	(Hz)	3655					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2.8					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		5.0	-	-		15.0
			FL_y (cm)		7.0	-	-		7.0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	147					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	28.0	28.0				28.0
	B-Imagesector angle		(Degree)	80.0	20.0				80.0
	B-Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			penet	penet				penet
	SENS PRI			-	-				-
	B Tx Power		(%)	1	1				1
	CFM Box start		(cm)	4.0	2.0				11.9
	CFM Box end		(cm)	8.2	6.2				16.1
	CFM Box angle		(Degree)	80.0	7.5				80.0
	CFM Tx power		(%)	100	100				100
	Ensemble			22.0	7.0				22.0
	Line Density			1	10				9
	Flow Res			high	low				low
	Velocity Range		(kHz)	6	7.5				0.1
	CFM Quality			low	low				low
	CFM Frequency			low	mid				high

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'AB2-7-RS' **Operating Mode:** Color Flow
SW-Release: Voluson S8 11.0.0.A

Index			MI	TIS Scanning	TIS Non-Scanning $A_{aprt} \le 1\ cm^2$	TIS Non-Scanning $A_{aprt} > 1\ cm^2$	TIB Scanning	TIB Non-Scanning	TIC
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	2.7	3.2	-	-	3.2	-	
Output Power	P	(mW)			-	-		-	244
Bounded output Power	P_1	(mW)		53			53		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.31					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.13					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.8						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	1.8						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			9.7
Equivalent aperture diameter	D_{eq}	(cm)				-			3.5
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	4.5						

A-1-2-19 Tables for AB2-7-RS at Color/Motion Mode (CM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'AB2-7-RS' **Operating Mode:** cM-Mode
SW-Release: Voluson S8 11.0.0.A

Index Label				MI	TIS scan	TIS non-scan $A_{aprt} \le 1\ cm^2$	TIS non-scan $A_{aprt} > 1\ cm^2$	TIB non-scan	TIC
Global Maximum Index Value				1.1	0.9	-	-	-	1.7
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	1.8					
	P	W_o	(mW)		92	-		-	106
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	4.5					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2.7	3.1	-	-	-	3.0
	Dim of A_{aprt}		X (cm)		1.1	-	-	-	1.4
			Y (cm)		1.3	-	-	-	1.3
Other Information	t_d	PD	(µsec)	0.9					
	prr	PRF	(Hz)	150					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2.8					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		9.0	-	-		12.0
			FL_y (cm)		7.0	-	-		7.0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	147					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	28.0	28.0				28.0
	B-Imagesector angle		(Degree)	20	20				20
	B-Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			penet	penet				penet
	SENS PRI			-	-				-
	B Tx Power		(%)	1	1				1
	Mc Tx Power		(%)	100	100				100
	Ensemble			16	12				16
	Flow Res			high	high				high
	Velocity Range		(kHz)	0.1	0.9				1.3
	Speed			6.0	6.0				6.0
	Mc Frequency			Low	Mid				Mid

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'AB2-7-RS' **Operating Mode:** cM-Mode
SW-Release: Voluson S8 11.0.0.A

Index			MI	TIS Scanning	TIS Non-Scanning $A_{aprt} \le 1\ cm^2$	TIS Non-Scanning $A_{aprt} > 1\ cm^2$	TIB Scanning	TIB Non-Scanning	TIC
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	2.7	3.1	-	-	2.6	-	
Output Power	P	(mW)			-	-		-	106
Bounded output Power	P_1	(mW)		59			125		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.31					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.13					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.8						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	1.8						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			1.8
Equivalent aperture diameter	D_{eq}	(cm)				-			1.5
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	4.5						

A-1-2-20 Tables for C1-5-RS at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'C1-5-RS' **Operating Mode:** B-Mode
SW-Release: Voluson S8 11.0.0.A

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1\ cm^2$	$A_{aprt} > 1\ cm^2$		
Global Maximum Index Value				1.2	0.6	-	-	-	1.7
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	1.8					
	P	W_o	(mW)		69	-		-	230
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	2.3					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2.1	3.2	-	-	-	3.0
	Dim of A_{aprt}		X (cm)		1.9	-	-	-	6.6
			Y (cm)		1.3	-	-	-	1.3
Other Information	t_d	PD	(µsec)	1.0					
	prr	PRF	(Hz)	3211					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2.1					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		1.5	-	-		20.0
			FL_y (cm)		6.0	-	-		6.0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	138					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	30.0	5.0				30.0
	B-Imagesector angle		(Degree)	20.0	20.0				68.9
	Quality			high	low				high
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			Low	resol				norm
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	ZoomBox start		(cm)	13.0	0.8				4.0
	ZoomBox end		(cm)	19.0	3.3				10.0
	ZoomBox angle		(Degree)	20.0	15.0				42.0
	Mode Type			B(Harm)	B				B
	Focal Depth		(cm)	1.5	1.5				20.0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'C1-5-RS' **Operating Mode:** B-Mode
SW-Release: Voluson S8 11.0.0.A

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \le 1\ cm^2$	$A_{aprt} > 1\ cm^2$			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	2.1	3.2	-	-	3.2	-	
Output Power	P	(mW)			-	-		-	230
Bounded output Power	P_1	(mW)		37			37		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.19					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.13					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.1						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	1.8						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			8.6
Equivalent aperture diameter	D_{eq}	(cm)				-			3.3
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	2.3						

A-1-2-21 Tables for C1-5-RS at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'C1-5-RS' **Operating Mode:** B+M Mode
SW-Release: Voluson S8 11.0.0.A

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				0.9	0.4	-	-	-	1.1
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	1.4					
	P	W_o	(mW)		129	-		-	129
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	5.8					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2.4	2.6	-	-	-	2.6
	Dim of A_{aprt}		X (cm)		2.9	-	-	-	2.9
			Y (cm)		1.3	-	-	-	1.3
Other Information	t_d	PD	(µsec)	0.6					
	prr	PRF	(Hz)	450					
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	2.2					
	d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		25.0	-	-		25.0
			FL_y (cm)		6.0	-	-		6.0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	129					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	30.0	30.0				30.0
	B-Imagesector angle		(Degree)	68.9	68.9				68.9
	Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			resol	penet				penet
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	Mode Type			M(Harm)	M				M
	Focal Depth		(cm)	9.0	25.0				25.0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'C1-5-RS' **Operating Mode:** B+M Mode
SW-Release: Voluson S8 11.0.0.A

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	2.4	2.6	-	-	2.1	-	
Output Power	P	(mW)			-	-		-	129
Bounded output Power	P_1	(mW)		37			87		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.20					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.08					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.2						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	1.4						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			3.8
Equivalent aperture diameter	D_{eq}	(cm)				-			2.2
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	5.8						

A-1-2-22 Tables for C1-5-RS at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'C1-5-RS' **Operating Mode:** Pulsed Doppler
SW-Release: Voluson S8 11.0.0.A

Index Label					MI	TIS scan	TIS non-scan $A_{aprt} \le 1\ cm^2$	TIS non-scan $A_{aprt} > 1\ cm^2$	TIB non-scan	TIC
Global Maximum Index Value					1.1	-	-	1.0	1.7	1.7
Assoc. Acoustic Parameter	IEC	FDA		Units						
	$p_{r\alpha}$	$p_{r.3}$		(MPa)	2.0					
	P	W_o		(mW)		-	-		45	137
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$		(mW)				77.1		
	z_s	z_1		(cm)				3.0		
	z_{bp}	z_{bp}		(cm)				3.0		
	z_b	z_{sp}		(cm)					3.9	
	z at max. $I_{pi,\alpha}$	z_{sp}		(cm)	4.5					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$		(cm)					0.3	
	f_{awf}	f_c		(MHz)	3.2	-	-	2.8	2.1	3.2
	Dim of A_{aprt}		X	(cm)		-	-	2.4	1.2	2.4
			Y	(cm)		-	-	1.3	1.3	1.3
Other Information	t_d	PD		(μsec)	0.8					
	prr	PRF		(Hz)	901					
	p_r at max. I_{pi}	$p_r@PII_{max}$		(MPa)	3.2					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$		(cm)					0.0	
	Focal Length		FL_x	(cm)		-	-	20.0		20.0
			FL_y	(cm)		-	-	6.0		6.0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}		(W/cm²)	201					
Operating Control Conditions	Gate width			(cm)	0.1			0.1	0.4	0.2
	Gate pos			(cm)	3.0			12.0	3.2	12.0
	Velocity Range			(kHz)	0.9			2.2	1.3	2.2
	Power			(%)	100			100	100	100

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'C1-5-RS' **Operating Mode:** Pulsed Doppler
SW-Release: Voluson S8 11.0.0.A

Index			MI	TIS Scanning	TIS Non-Scanning $A_{aprt} \le 1\ cm^2$	TIS Non-Scanning $A_{aprt} > 1\ cm^2$	TIB Scanning	TIB Non-Scanning	TIC
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	3.2	-	-	2.8	-	2.1	
Output Power	P	(mW)			-	137		45	137
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				77		25.4	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				238		486	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				105		257	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.45					0.37	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.17					0.20	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3.2						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.0						
-12 dB output beam area	A_{aprt}	(cm²)			-	3.1			3.1
Equivalent aperture diameter	D_{eq}	(cm)				2.0			2.0
Depth for *TIS*	z_s	(cm)				3.0			
Depth for *TIB*	z_b	(cm)						3.9	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	4.5						

A-1-2-23 Tables for C1-5-RS at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'C1-5-RS' **Operating Mode:** Color Flow
SW-Release: Voluson S8 11.0.0.A

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1$ cm²	$A_{aprt} > 1$ cm²		
Global Maximum Index Value				1.2	0.4	-	-	-	1.7
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	1.8					
	P	W_o	(mW)		37	-		-	262
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	6.9					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2.1	3.2	-	-	-	3.2
	Dim of A_{aprt}		X (cm)		1.3	-	-	-	9.1
			Y (cm)		1.3	-	-	-	1.3
Other Information	t_d	PD	(µsec)	2.1					
	prr	PRF	(Hz)	1160					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2.9					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		3.0	-	-		20.0
			FL_y (cm)		6.0	-	-		6.0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	143					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	30.0	30.0				30.0
	B-Imagesector angle		(Degree)	68.9	20.0				68.9
	B-Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			norm	norm				norm
	SENS PRI			-	-				-
	B Tx Power		(%)	1	1				1
	CFM Box start		(cm)	7.4	1.1				25.5
	CFM Box end		(cm)	11.9	5.6				30.0
	CFM Box angle		(Degree)	68.9	7.2				68.9
	CFM Tx power		(%)	100	100				100
	Ensemble			7.0	22.0				9.0
	Line Density			1	1				9
	Flow Res			high	high				high
	Velocity Range		(kHz)	0.1	9.0				1.8
	CFM Quality			low	low				high
	CFM Frequency			low	high				high

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'C1-5-RS' **Operating Mode:** Color Flow
SW-Release: Voluson S8 11.0.0.A

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \le 1$ cm²	$A_{aprt} > 1$ cm²			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	2.1	3.2	-	-	3.2	-	
Output Power	P	(mW)			-	-		-	262
Bounded output Power	P_1	(mW)		29			29		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.82					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.30					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.6						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	1.8						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			11.8
Equivalent aperture diameter	D_{eq}	(cm)				-			3.9
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	6.9						

A-1-2-24 Tables for C1-5-RS at Color/Motion Mode (CM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'C1-5-RS' **Operating Mode:** cM-Mode
SW-Release: Voluson S8 11.0.0.A

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				1.5	1.0	-	-	-	1.7
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.2					
	P	W_o	(mW)		137	-		-	137
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	3.7					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2.1	2.8	-	-	-	2.8
	Dim of A_{aprt}		X (cm)		2.4	-	-	-	2.4
			Y (cm)		1.3	-	-	-	1.3
Other Information	t_d	PD	(µsec)	2.0					
	prr	PRF	(Hz)	150					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2.9					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		20.0	-	-		20.0
			FL_y (cm)		6.0	-	-		6.0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	211					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	30.0	30.0				30.0
	B-Imagesector angle		(Degree)	20	20				20
	B-Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			norm	norm				norm
	SENS PRI			-	-				-
	B Tx Power		(%)	1	1				1
	Mc Tx Power		(%)	100	100				100
	Ensemble			16	12				12
	Flow Res			high	high				high
	Velocity Range		(kHz)	0.1	0.9				0.9
	Speed			6.0	6.0				6.0
	Mc Frequency			Low	Mid				Mid

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'C1-5-RS' **Operating Mode:** cM-Mode
SW-Release: Voluson S8 11.0.0.A

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	2.1	2.8	-	-	2.1	-	
Output Power	P	(mW)			-	-		-	137
Bounded output Power	P_1	(mW)		75			171		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.72					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.42					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.9						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.2						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			3.1
Equivalent aperture diameter	D_{eq}	(cm)				-			2.0
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	3.7						

A-1-2-25 Tables for 4C-RS at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: '4C-RS' **Operating Mode:** B-Mode
SW-Release: Voluson S8 11.0.0.A

Index Label				MI	TIS scan	TIS non-scan $A_{aprt} \le 1\ cm^2$	TIS non-scan $A_{aprt} > 1\ cm^2$	TIB non-scan	TIC
Global Maximum Index Value				1.4	0.8	-	-	-	1.7
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.1					
	P	W_o	(mW)		194	-		-	262
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	4.3					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2.3	5.0	-	-	-	3.1
	Dim of A_{aprt}		X (cm)		5.8	-	-	-	8.5
			Y (cm)		1.3	-	-	-	1.3
Other Information	t_d	PD	(µsec)	0.8					
	prr	PRF	(Hz)	808					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3.0					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		12.0	-	-		7.0
			FL_y (cm)		6.0	-	-		6.0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	271					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	30.1	30.1				30.1
	B-Imagesector angle		(Degree)	20.0	20.0				57.6
	Quality			low	high				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			CPI	-				-
	SENS PRI			11.0	1.0				1.0
	Power		(%)	100	100				100
	ZoomBox start		(cm)	11.3	4.5				0.0
	ZoomBox end		(cm)	14.3	7.5				3.0
	ZoomBox angle		(Degree)	20.0	20.0				57.6
	Mode Type			Contrast	BFlow				BFlow
	Focal Depth		(cm)	5.0	12.0				7.0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: '4C-RS' **Operating Mode:** B-Mode
SW-Release: Voluson S8 11.0.0.A

Index			MI	TIS Scanning	TIS Non-Scanning $A_{aprt} \le 1\ cm^2$	TIS Non-Scanning $A_{aprt} > 1\ cm^2$	TIB Scanning	TIB Non-Scanning	TIC
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	2.3	5.0	-	-	5.0	-	
Output Power	P	(mW)			-	-		-	262
Bounded output Power	P_1	(mW)		33			33		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.43					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.22					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3.0						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.1						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			11.1
Equivalent aperture diameter	D_{eq}	(cm)				-			3.8
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	4.3						

A-1-2-26 Tables for 4C-RS at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: '4C-RS' **Operating Mode:** B+M Mode
SW-Release: Voluson S8 11.0.0.A

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1\ cm^2$	$A_{aprt} > 1\ cm^2$		
Global Maximum Index Value				1.3	0.3	-	-	-	1.0
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.0					
	P	W_o	(mW)		118	-		-	118
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	4.5					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2.5	2.4	-	-	-	2.4
	Dim of A_{aprt}		X (cm)		3.1	-	-	-	3.1
			Y (cm)		1.3	-	-	-	1.3
Other Information	t_d	PD	(µsec)	0.5					
	prr	PRF	(Hz)	900					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2.9					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		15.0	-	-		15.0
			FL_y (cm)		6.0	-	-		6.0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	215					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	30.1	30.1				30.1
	B-Imagesector angle		(Degree)	57.6	57.6				57.6
	Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			penet	penet				penet
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	Mode Type			M	M				M
	Focal Depth		(cm)	7.0	15.0				15.0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: '4C-RS' **Operating Mode:** B+M Mode
SW-Release: Voluson S8 11.0.0.A

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \le 1\ cm^2$	$A_{aprt} > 1\ cm^2$			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	2.5	2.4	-	-	2.6	-	
Output Power	P	(mW)			-	-		-	118
Bounded output Power	P_1	(mW)		29			61		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.24					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.11					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.9						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.0						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			4.0
Equivalent aperture diameter	D_{eq}	(cm)				-			2.3
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	4.5						

A-1-2-27 Tables for 4C-RS at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: '4C-RS' **Operating Mode:** Pulsed Doppler
SW-Release: Voluson S8 11.0.0.A

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				1.3	-	-	0.9	1.7	1.7
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.1					
	P	W_o	(mW)		-	-		127	129
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				68.7		
	z_s	z_1	(cm)				4.1		
	z_{bp}	z_{bp}	(cm)				3.2		
	z_b	z_{sp}	(cm)					4.2	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	4.6					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0.8	
	f_{awf}	f_c	(MHz)	2.6	-	-	2.7	2.3	2.7
	Dim of A_{aprt}		X (cm)		-	-	2.7	2.7	2.1
			Y (cm)		-	-	1.3	1.3	1.3
Other Information	t_d	PD	(µsec)	0.6					
	prr	PRF	(Hz)	901					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3.2					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					0.0	
	Focal Length		FL_x (cm)		-	-	15.0		12.0
			FL_y (cm)		-	-	6.0		6.0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	160					
Operating Control Conditions	Gate width		(cm)	0.1			0.1	0.1	0.3
	Gate pos		(cm)	6.0			9.0	9.0	6.1
	Velocity Range		(kHz)	0.9			3.3	0.9	3.3
	Power		(%)	100			100	100	100

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: '4C-RS' **Operating Mode:** Pulsed Doppler
SW-Release: Voluson S8 11.0.0.A

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	2.5	-	-	2.7	-	2.3	
Output Power	P	(mW)			-	145		127	129
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				68		64.6	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				265		191	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				113		78	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.30					0.21	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.11					0.09	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.9						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.0						
-12 dB output beam area	A_{aprt}	(cm²)			-	3.5			2.8
Equivalent aperture diameter	D_{eq}	(cm)				2.1			1.9
Depth for *TIS*	z_s	(cm)				4.1			
Depth for *TIB*	z_b	(cm)						4.2	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	4.5						

A-1-2-28 Tables for 4C-RS at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: '4C-RS' **Operating Mode:** Color Flow
SW-Release: Voluson S8 11.0.0.A

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1\ cm^2$	$A_{aprt} > 1\ cm^2$		
Global Maximum Index Value				1.3	0.7	-	-	-	1.7
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.0					
	P	W_o	(mW)		47	-		-	267
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	4.6					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2.3	3.2	-	-	-	3.2
	Dim of A_{aprt}		X (cm)		1.1	-	-	-	8.9
			Y (cm)		1.3	-	-	-	1.3
Other Information	t_d	PD	(µsec)	2.1					
	prr	PRF	(Hz)	1987					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2.8					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		1.5	-	-		15.0
			FL_y (cm)		6.0	-	-		6.0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	154					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	30.1	30.1				30.1
	B-Imagesector angle		(Degree)	57.6	20.0				57.6
	B-Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			penet	penet				penet
	SENS PRI			-	-				-
	B Tx Power		(%)	1	1				1
	CFM Box start		(cm)	6.4	0.0				25.6
	CFM Box end		(cm)	10.9	4.5				30.1
	CFM Box angle		(Degree)	57.6	7.1				57.6
	CFM Tx power		(%)	100	100				100
	Ensemble			7.0	9.0				22.0
	Line Density			1	10				1
	Flow Res			low	low				low
	Velocity Range		(kHz)	5	9.0				1.8
	CFM Quality			low	high				low
	CFM Frequency			low	high				high

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: '4C-RS' **Operating Mode:** Color Flow
SW-Release: Voluson S8 11.0.0.A

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \le 1\ cm^2$	$A_{aprt} > 1\ cm^2$			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	2.3	3.2	-	-	3.2	-	
Output Power	P	(mW)			-	-		-	267
Bounded output Power	P_1	(mW)		44			44		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.68					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.33					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.8						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.0						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			11.6
Equivalent aperture diameter	D_{eq}	(cm)				-			3.8
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	4.6						

A-1-2-29 Tables for 4C-RS at Color/Motion Mode (CM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: '4C-RS' **Operating Mode:** cM-Mode
SW-Release: Voluson S8 11.0.0.A

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				1.2	0.9	-	-	-	1.7
	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.0					
	P	W_o	(mW)		146	-		-	154
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
Assoc.	z_s	z_1	(cm)				-		
Acoustic	z_{bp}	z_{bp}	(cm)				-		
Parameter	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	4.7					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2.7	2.6	-	-	-	2.6
	Dim of A_{aprt}		X (cm)		2.7	-	-	-	2.7
			Y (cm)		1.3	-	-	-	1.3
	t_d	PD	(µsec)	0.7					
	prr	PRF	(Hz)	150					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3.0					
Other	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
Information	Focal Length		FL_x (cm)		15.0	-	-		15.0
			FL_y (cm)		6.0	-	-		6.0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	151					
	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	30.1	30.1				30.1
	B-Imagesector angle		(Degree)	20	58				20
	B-Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
Operating	Frequency Setting			penet	penet				penet
Control	SENS PRI			-	-				-
Conditions	B Tx Power		(%)	100	1				100
	Mc Tx Power		(%)	100	100				100
	Ensemble			16	12				8
	Flow Res			high	high				high
	Velocity Range		(kHz)	0.1	1.8				0.9
	Speed			6.0	6.0				6.0
	Mc Frequency			Mid	Mid				Mid

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: '4C-RS' **Operating Mode:** cM-Mode
SW-Release: Voluson S8 11.0.0.A

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	2.7	2.6	-	-	2.7	-	
Output Power	P	(mW)			-	-		-	154
Bounded output Power	P_1	(mW)		71			133		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.26					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.11					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3.0						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.0						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			3.5
Equivalent aperture diameter	D_{eq}	(cm)				-			2.1
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	4.7						

A-1-2-30 Tables for E8C-RS at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'E8C-RS'
SW-Release: Voluson S8 11.0

Operating Mode: B-Mode

Index Label				MI	TIS scan	TIS non-scan $A_{aprt} \le 1\ cm^2$	TIS non-scan $A_{aprt} > 1\ cm^2$	TIB non-scan	TIC
Global Maximum Index Value				1.1	0.3	-	-	-	0.6
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.6					
	P	W_o	(mW)		19	-		-	40
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	1.8					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	5.4	5.8	-	-	-	5.4
	Dim of A_{aprt}		X (cm)		2.0	-	-	-	4.0
			Y (cm)		0.5	-	-	-	0.5
Other Information	t_d	PD	(µsec)	0.3					
	prr	PRF	(Hz)	5017					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3.6					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		1.0	-	-		8.0
			FL_y (cm)		2.8	-	-		2.8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	308					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	16.0	3.0				16.0
	B-Imagesector angle		(Degree)	122.6	122.6				122.6
	Quality			high	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			norm	norm				norm
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	ZoomBox start		(cm)	3.2	1.3				1.6
	ZoomBox end		(cm)	6.4	2.3				4.8
	ZoomBox angle		(Degree)	122.6	73.6				122.6
	Mode Type			B	B				B
	Focal Depth		(cm)	2.0	1.0				8.0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'E8C-RS'
SW-Release: Voluson S8 11.0.0.A

Operating Mode: B-Mode

Index notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units	MI	TIS Scanning	TIS Non-Scanning $A_{aprt} \le 1\ cm^2$	TIS Non-Scanning $A_{aprt} > 1\ cm^2$	TIB Scanning	TIB Non-Scanning	TIC
Acoustic working frequency	f_{awf}	(MHz)	5.4	5.8	-	-	5.8	-	
Output Power	P	(mW)			-	-		-	40
Bounded output Power	P_1	(mW)		10			10		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.16					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.08					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3.6						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.6						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			2.0
Equivalent aperture diameter	D_{eq}	(cm)				-			1.6
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1.8						

A-1-2-31 Tables for E8C-RS at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'E8C-RS' **Operating Mode:** B+M Mode
SW-Release: Voluson S8 11.0.0.A

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				1.1	0.3	-	-	-	0.5
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.4					
	P	W_o	(mW)		26	-		-	26
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	0.9					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	4.6	5.4	-	-	-	5.4
	Dim of A_{aprt}		X (cm)		1.6	-	-	-	1.6
			Y (cm)		0.5	-	-	-	0.5
Other Information	t_d	PD	(µsec)	0.2					
	prr	PRF	(Hz)	900					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2.6					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		8.0	-	-		8.0
			FL_y (cm)		2.8	-	-		2.8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	244					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	16.0	16.0				16.0
	B-Imagesector angle		(Degree)	122.6	122.6				122.6
	Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			penet	norm				norm
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	Mode Type			M	M				M
	Focal Depth		(cm)	1.0	8.0				8.0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'E8C-RS' **Operating Mode:** B+M Mode
SW-Release: Voluson S8 11.0.0.A

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	4.6	5.4	-	-	4.4	-	
Output Power	P	(mW)			-	-		-	26
Bounded output Power	P_1	(mW)		12			16		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.08					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.06					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2.6						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.4						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			0.8
Equivalent aperture diameter	D_{eq}	(cm)				-			1.0
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	0.9						

A-1-2-32 Tables for E8C-RS at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'E8C-RS' **Operating Mode:** Pulsed Doppler
SW-Release: Voluson S8 11.0.0.A

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1$ cm²	$A_{aprt} > 1$ cm²		
Global Maximum Index Value				1.1	-	0.9	-	0.8	0.9
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.3					
	P	W_o	(mW)		-	29		29	33
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					1.4	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	2.1					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0.5	
	f_{awf}	f_c	(MHz)	4.7	-	6.5	-	4.7	5.8
	Dim of A_{aprt}		X (cm)		-	1.4	-	1.4	1.4
			Y (cm)		-	0.5	-	0.5	0.5
Other Information	t_d	PD	(µsec)	0.6					
	prr	PRF	(Hz)	901					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3.2					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					0.0	
	Focal Length		FL_x (cm)		-	8.0	-		8.0
			FL_y (cm)		-	2.8	-		2.8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	223					
Operating Control Conditions	Gate width		(cm)	0.1		0.3		0.4	0.3
	Gate pos		(cm)	0.0		4.8		4.9	4.8
	Velocity Range		(kHz)	0.9		3.3		7.0	1.3
	Power		(%)	100		100		100	100

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'E8C-RS' **Operating Mode:** Pulsed Doppler
SW-Release: Voluson S8 11.0.0.A

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \le 1$ cm²	$A_{aprt} > 1$ cm²			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	4.7	-	6.5	-	-	4.7	
Output Power	P	(mW)			29	-		29	33
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				-		18.6	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		125	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		68	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.26					0.02	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.13					0.01	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3.2						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.3						
-12 dB output beam area	A_{aprt}	(cm²)			0.7	-			0.7
Equivalent aperture diameter	D_{eq}	(cm)				-			1.0
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						1.4	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	2.1						

A-1-2-33 Tables for E8C-RS at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'E8C-RS' **Operating Mode:** Color Flow
SW-Release: Voluson S8 11.0.0.A

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				1.1	0.4	-	-	-	0.7
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.5					
	P	W_o	(mW)		46	-		-	47
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	2.1					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	4.7	6.5	-	-	-	5.6
	Dim of A_{aprt}	X	(cm)		3.8	-	-	-	3.8
		Y	(cm)		0.5	-	-	-	0.5
Other Information	t_d	PD	(µsec)	1.0					
	prr	PRF	(Hz)	873					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3.3					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length	FL_x	(cm)		8.0	-	-		8.0
		FL_y	(cm)		2.8	-	-		2.8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	228					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	16.0	16.0				16.0
	B-Imagesector angle		(Degree)	122.6	122.6				122.6
	B-Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			resol	resol				resol
	SENS PRI			-	-				-
	B Tx Power		(%)	1	1				1
	CFM Box start		(cm)	0.6	4.5				10.7
	CFM Box end		(cm)	3.0	6.9				13.1
	CFM Box angle		(Degree)	122.6	122.6				122.6
	CFM Tx power		(%)	100	100				100
	Ensemble			7.0	22.0				8.0
	Line Density			1	1				10
	Flow Res			low	low				high
	Velocity Range		(kHz)	0.1	0.1				4.0
	CFM Quality			low	low				low
	CFM Frequency			low	high				mid

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'E8C-RS' **Operating Mode:** Color Flow
SW-Release: Voluson S8 11.0.0.A

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1 cm²	A_{aprt}>1 cm²			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	4.7	6.5	-	-	6.5	-	
Output Power	P	(mW)			-	-		-	47
Bounded output Power	P_1	(mW)		12			12		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.56					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.28					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3.3						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.5						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			1.9
Equivalent aperture diameter	D_{eq}	(cm)				-			1.6
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	2.1						

A-1-2-34 Tables for E8C-RS at Color/Motion Mode (CM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 'E8C-RS' **Operating Mode:** cM-Mode
SW-Release: Voluson S8 11.0.0.A

Index Label				MI	TIS scan	TIS non-scan $A_{aprt}\le1$ cm²	TIS non-scan $A_{aprt}>1$ cm²	TIB non-scan	TIC
Global Maximum Index Value				1.1	0.9	-	-	-	0.9
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2.5					
	P	W_o	(mW)		30	-		-	32
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	1.8					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	4.7	6.4	-	-	-	5.6
	Dim of A_{aprt}		X (cm)		1.4	-	-	-	1.4
			Y (cm)		0.5	-	-	-	0.5
Other Information	t_d	PD	(µsec)	0.6					
	prr	PRF	(Hz)	150					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3.3					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		8.0	-	-		8.0
			FL_y (cm)		2.8	-	-		2.8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	157					
Operating Control Conditions	B-Imagesector start		(cm)	0.0	0.0				0.0
	B-Imagesector end		(cm)	16.0	16.0				16.0
	B-Imagesector angle		(Degree)	20	123				123
	B-Quality			low	low				low
	Zoom			1.0	1.0				1.0
	Foc. Zones			1	1				1
	Frequency Setting			resol	resol				resol
	SENS PRI			-	-				-
	B Tx Power		(%)	93	1				1
	Mc Tx Power		(%)	100	100				100
	Ensemble			16	16				12
	Flow Res			high	high				high
	Velocity Range		(kHz)	0.1	2.4				3.2
	Speed			6.0	6.0				6.0
	Mc Frequency			Low	High				Mid

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 'E8C-RS' **Operating Mode:** cM-Mode
SW-Release: Voluson S8 11.0.0.A

Index			MI	TIS Scanning	TIS Non-Scanning $A_{aprt}\le1$ cm²	TIS Non-Scanning $A_{aprt}>1$ cm²	TIB Scanning	TIB Non-Scanning	TIC
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	4.7	6.4	-	-	4.7	-	
Output Power	P	(mW)			-	-		-	32
Bounded output Power	P_1	(mW)		30			34		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal-average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0.16					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0.09					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3.3						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2.5						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			0.7
Equivalent aperture diameter	D_{eq}	(cm)				-			1.0
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1.8						

GE Healthcare
65-1, Sangdaewon-dong, Jungwon-gu, Seongnam-si,
Gyeonggi-do 462-120
Korea

www.gehealthcare.com