GE Healthcare

Voluson® E8 / Voluson® E8 Expert

Service Manual

- Voluson® E8 systems with Software version SW 6.x.x (BT06)
- Voluson® E8 / Voluson® E8 Expert systems with Software version SW 7.x.x (BT08)

Part Number: KTI106056
Revision: 5

CE 0123

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 GEMS 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 GEMS 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 ЗЛЕКТРИЧЕСКИМ 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 영어 이외의 언어를 요구할 경우, 번역 서비스를 제공하는 것은 고객의 책임입니다.
- 본 서비스 지침서를 참고했고 이해하지 않는 한은 해당 장비를 수리하려고 시도하지 마십시오.
- 이 경고에 유의하지 않으면 전기 쇼크, 기계의 혹은 다른 위험으로부터 서비스 제공자, 운영자 혹은 환자에게 위험을 가할 수 있습니다.

DAMAGE IN TRANSPORTATION - FOR USA ONLY

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 Global 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, 9900 Innovation Drive (RP-2123), Wauwatosa, WI 53226, USA.

GE Healthcare employees should use the iTrak System to report all documentation errors or omissions.

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.***

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Revision History

Revision	Date	Reason for change
1	October 27, 2006	Initial Release
2	March 16, 2007	Software Upgrade to SW 6.2.x
3	September 2007	Implementation of new parts, release of BT08 software version (SW 7.0.x)
4	May 2008	general update, release of new BT06 and BT08 software versions
5	June 2009	Implementation of Appendix A (Acoustic Output & Index Determination Tables)

List of Effected Pages

Pages	Revision	Pages	Revision	Pages	Revision
Title Page	5	Chapter 3 - Setup Instructions pages 3-1 to 3-92	5	Chapter 9 - Renewal Parts pages 9-1 to 9-46	5
Important Precautions pages i to ix	5	Chapter 4 - Functional Checks pages 4-1 to 4-48	5	Chapter 10 - Care & Maintenance pages 10-1 to 10-26	5
Rev History/LOEP page x	5	Chapter 5 - Components and Functions (Theory) pages 5-1 to 5-70	5	Appendix A - Acoustic Output & Index Determination Tables pages A-1 to A-96	5
Table of Contents pages xi to xxxiv	5	Chapter 6 - Service Adjustments pages 6-1 to 6-12	5	Index pages I to IV	5
Chapter 1 - Introduction pages 1-1 to 1-16	5	Chapter 7 - Diagnostics/ Troubleshooting pages 7-1 to 7-44	5	Back Cover	5
Chapter 2 - Site Preparation pages 2-1 to 2-10	5	Chapter 8 - Replacement Procedures pages 8-1 to 8-32	5		

Table of Contents

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

APPENDIX A
Acoustic Output & Index Determination Tables

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® E8** and/or **Voluson® E8 Expert** 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® E8** and **Voluson® E8 Expert** ultrasound systems.*
*For the sake of simplicity, **descriptions in this manual will be briefly denoted with "Voluson® E8", if no special differentiation is required**.*

This Service Manual provides installation and service information for the Voluson® E8 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 for the Voluson® E8.
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 to the Voluson® E8.
7.) **Chapter 7 - Diagnostics/Troubleshooting**: Provides procedures for running diagnostic or related routines for the Voluson® E8.
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 for the Voluson® E8.
10.) **Chapter 10 - Care & Maintenance**: Provides periodic maintenance procedures for the Voluson® E8.

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 - Site Preparation)

1-1-4 Models Covered by this Manual

Table 1-2 Voluson® E8 - Model Designations

Part Number	Description	BT version
H48651PS	Voluson® E8 Console 230V/50Hz	BT06
H48651PT	Voluson® E8 Console 115V USA	BT06
H48651PW	Voluson® E8 Console 115V	BT06
H48651PY	Voluson® E8 Console 100V JAPAN	BT06
H48651PZ	Voluson® E8 Console 230V KOREA	BT06
H48651R	Voluson® E8 Console 230V CHINA	BT06
H48651RA	Voluson® E8 Console 230V AUSTRALIA	BT06
H48651RB	Voluson® E8 Console 230V INDIA	BT06
H48661JK	Voluson® E8 Console 230V/50Hz	BT08
H48661JL	Voluson® E8 Console 115V USA	BT08
H48661JM	Voluson® E8 Console 115V	BT08
H48661JN	Voluson® E8 Console 100V JAPAN	BT08
H48661JP	Voluson® E8 Console 230V KOREA	BT08
H48661JR	Voluson® E8 Console 230V CHINA	BT08
H48661JS	Voluson® E8 Console 230V AUSTRALIA	BT08
H48661JT	Voluson® E8 Console 230V INDIA	BT08

Table 1-3 Voluson® E8 Expert - Model Designations

Part Number	Description	BT version
H48661MY	Voluson® E8 Expert Console 230V/50Hz	BT08
H48661N	Voluson® E8 Expert Console 115V USA	BT08
H48661MZ	Voluson® E8 Expert Console 115V	BT08
H48661NA	Voluson® E8 Expert Console 100V JAPAN	BT08
H48661NB	Voluson® E8 Expert Console 230V KOREA	BT08
H48661NC	Voluson® E8 Expert Console 230V CHINA	BT08
H48661ND	Voluson® E8 Expert Console 230V AUSTRALIA	BT08
H48661NE	Voluson® E8 Expert Console 230V INDIA	BT08

1-1-5 System History - Hardware and Software Versions

This manual applies to:

- Voluson® E8 systems with Software version 6.0.x (BT06) installed
- Voluson® E8 systems with Software version 6.1.x (BT06) installed
- Voluson® E8 systems with Software version 6.2.x (BT06) installed
- Voluson® E8 / Voluson® E8 Expert systems with Software version 7.0.x (BT08) installed

NOTICE The **Voluson® E8 Expert** offers full functionality and performance of “standard” Voluson® E8 platform by providing the new feature “'Wide Sector” (extended field of view of curved array probes by means of beam steering) on all probes capable of this feature. Secondly the function of the Matrix Volume Probes (RAM3-8 and RSM5-14) and the high resolution transvaginal probe RIC6-12 is enabled.

The **Voluson® E8 Expert** system is only distinguished by the **P**ermanent activated “Expert option” (see: *Figure 8-16: System Setup - Administration - OPTIONS page (BT08 systems) on page 8-14*) and the “Expert” label on the User Interface (right above the Touch Panel); it has NO own serial number!

1-1-6 Purpose of Operator Manual(s)

The Operator Manual(s) should be fully read and understood before operating the Voluson® E8 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® E8 ultrasound units listed in Table 1-2 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.

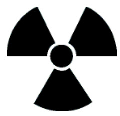
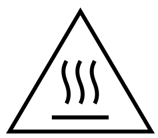
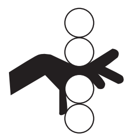
BT Version: Is used when options or features are specific for BT-Software versions.

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

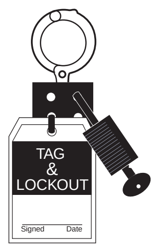
Important information will always be preceded by the exclamation point contained within a triangle, as seen throughout this chapter. In addition to text, several different graphical icons (symbols) may be used to make you aware of specific types of hazards that could cause harm. Even if a symbol isn't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

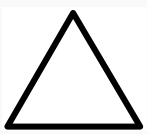
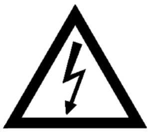
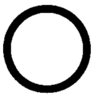
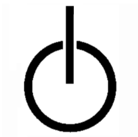
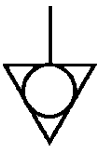
LABEL/SYMBOL	PURPOSE/MEANING	LOCATION
Identification and Rating Plate	Manufacturer's name and address Model and serial numbers Electrical ratings	Rear side of the unit on each probe
Device Listing/Certification Labels	Laboratory logo or labels denoting conformance with industry safety standards such as UL or IEC.	Rear side of the unit
CE 0123	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 the plug of each probe
Type/Class Label	Used to indicate the degree of safety or protection.	
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
	Equipment Type BF (man in the box, symbol IEC 60878-5333) indicates B Type equipment having even more electrical isolation than standard Type B equipment because it is intended for intimate patient contact.	Probe connectors Main label on rear of system
	To identify a defibrillation-proof type CF (heart in box with "electrodes", symbol IEC 60878-5336) applied part complying with IEC 60601-1.	Front side of the ECG-preamplifier
"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

Table 1-6 Product Icons (Continued)

LABEL/SYMBOL	PURPOSE/MEANING	LOCATION
	"CAUTION - Dangerous voltage" (the lightning flash with arrowhead in equilateral triangle) is used to indicate electric shock hazards.	Rear side of Monitor
	"Mains OFF" Indicates the power off position of the mains power switch.	rear of system at mains switch (on primary power supply - RTN)
	"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 (on primary power supply - RTN)
	"Protective Earth" Indicates the protective earth (grounding) terminal.	rear of system at mains switch (on primary power supply - RTN)
	"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 - RTN)
	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 the Touch Panel display, contain mercury.)	Rear side of the unit not visible: - below the cover on read side of Monitor - on rear side of the Touch Panel
	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® E8 Training are authorized to service the equipment.

1-3-3 Mechanical Safety

CAUTION **The Voluson® E8 weighs 130 kg or more, depending on installed peripherals, (300 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® E8 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® E8 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.

WARNING ***CONNECTING A VOLUSON® E8 SCANNER TO THE WRONG VOLTAGE LEVEL WILL MOST LIKELY DESTROY THE SCANNER.***

1-3-4-2 Probes

All the probes for the Voluson® E8 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® E8 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® E8 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® E8 ultrasound system.

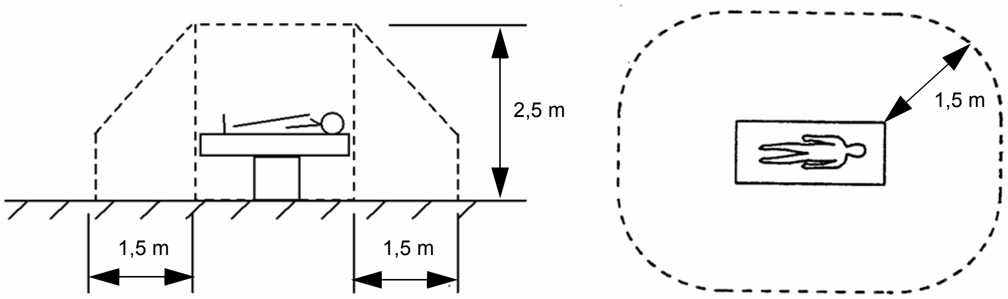
* IEC xxx stands for standards such as:

- 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 3-9.

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® E8 system chassis must be firmly secured in position.

1-3-6 Labels Locations

The Voluson® E8 ultrasound system comes equipped with product labels and icons.
These labels and icons represent pertinent information regarding the operation of the unit.

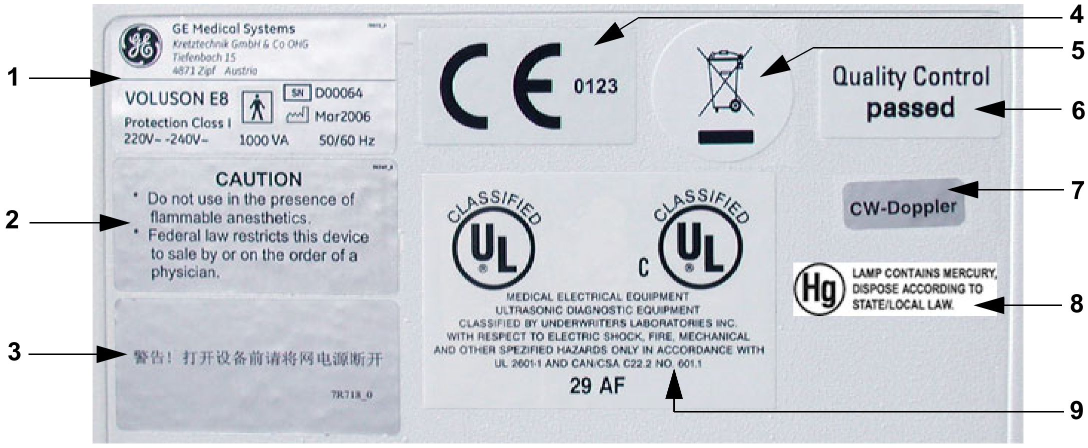


Figure 1-1 Labeling (on rear of the Voluson® E8 system)

1 Main Label	**6 Quality Control Label**
2 Caution	**7 CW-Doppler (only if the CW-Doppler option is installed)**
3 Warning label (for China only)	**8 Hg Vermont Label**
4 CE Label	**9 UL Label or TUEV NRTL Label**
5 WEEE Disposal Icon	

1-3-6-1 Main Label

The Main Label is located on the rear of the Voluson® E8 system.

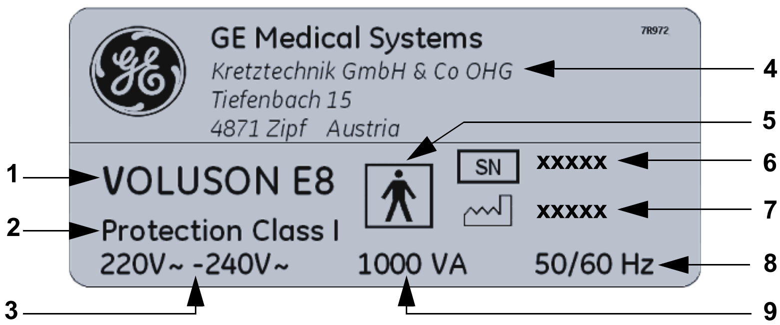


Figure 1-2 Main Label (located on rear of Voluson® E8)

1 Model Type	**6 System Serial Number**
2 Protection Class I	**7 Manufacturing date**
3 System Voltage Setting	**8 Frequency**
4 Manufacturer	**9 Power Consumption nominal**
5 Safety type: Type BF	

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® E8.

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® E8 system in the original packaging:

- system must be lowered to its minimum height with monitor flapped down (see Figure on page 3-6)
- the Control Console has to be centered and locked in “unextended” position

NOTE: For Control Console Positioning refer to Section 6-5 on page 6-8.

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 refer to Chapter 2 in the Basic User Manual of the Voluson® E8.

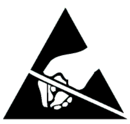
1-4-2 Compliance

The Voluson® E8 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) 2620 13585 +(95) 6277-3444	

1-5-2 System Manufacturer

Table 1-8 System Manufacturer

Manufacturer	Telephone	FAX
GE Medical Systems Kretztechnik GmbH & Co OHG Tiefenbach 15 A-4871 Zipf Austria	+43-7682-3800-0	+43-7682-3800-47

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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® E8 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
10 to 40°C (50 to 104°F)	30 to 80% rH non-condensing	3410 BTU/hour	-10 to 40 °C (14 to 104°F)	< 90% 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® E8 is 3410 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® E8 Power Requirements

Table 2-3 Electrical Specifications for Voluson® E8

Voltage	Tolerances	Current	Frequency
100 - 130 VAC	±10%	10.0 ... 7.7 A	50, 60 Hz (±2%)
220 - 240 VAC	±10%	4.5 ... 4.2 A	50, 60 Hz (±2%)

Power Consumption nominal 1000 VA including all options.

Mains outlet: Mains socket AUX for accessories.
All mains outlets are co-switched by the unit's mains switch via built-in isolation transformer.
Output voltage for AUX: 115V or 230V.

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 345VA!

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® E8 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® E8 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® E8 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

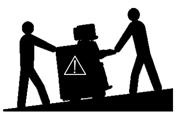
NOTE: Temperature in degrees C. Conversion to degrees F = °C (9/5) + 32).

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® E8 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® E8

The physical dimensions and weight (without Peripherals) of the Voluson® E8 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 - Control Console Positioning, on page 5-57.

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

Height	Width	Depth	Weight
1520 mm / 59.9 inch * 1320 mm / 52.0 inch ** 1120 mm / 44.1 inch ***	580 mm / 22.8 inch	1160 mm / 45.6 inch * 960 mm / 37.8 inch **	130 kg / 286.6 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)
*** absolute minimum (Monitor flapped down)

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® E8 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® E8 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® E8 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 3-89 on page 3-91 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.

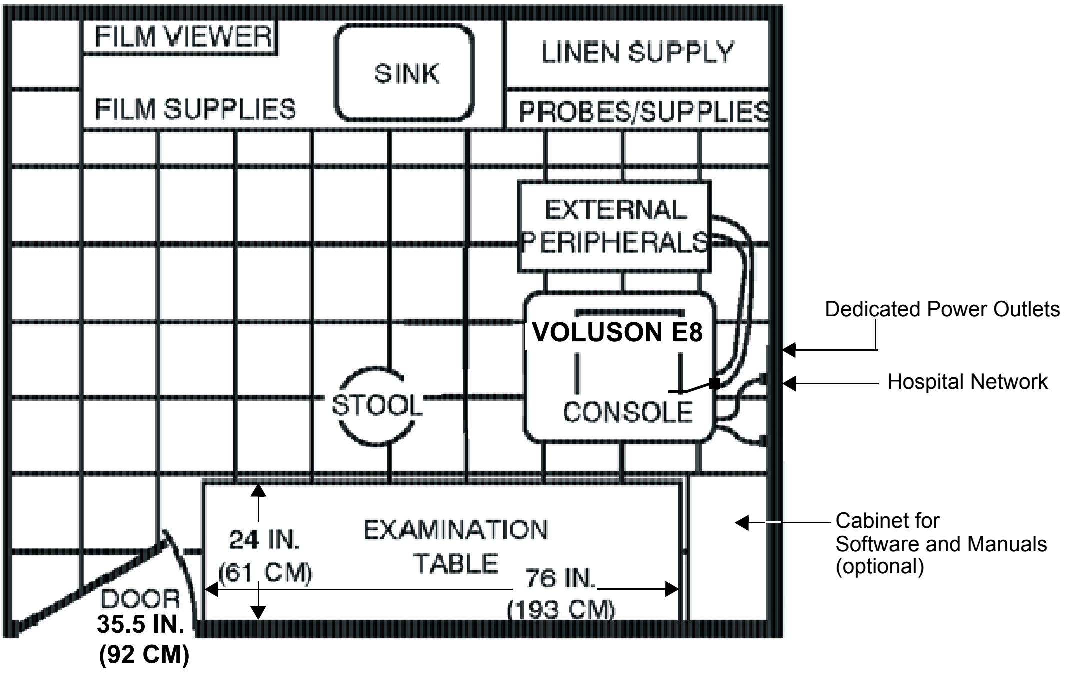


Figure 2-1 Recommended Floor Plan 4.3m x 5.2m (14ft x 17ft)

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® E8 ultrasound unit to work with other network connections, the network administrator must provide some necessary information.

Use the Connectivity Setup Worksheet on page 3-90 to record required information that must include:

- **Voluson® E8 Details:** DICOM network details for the Voluson® E8 unit, including the host name, local port, IP address, AE title and net mask.
- **Routing Information:** IP addresses for the default gateway and other routers in use at he 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 3-87.

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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® E8 ultrasound system. Included are procedures to receive, unpack and configure the equipment. A worksheet is provided (see: page 3-90 to page 3-91) 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	Dependant on the required configuration
DICOM Option (connectivity)	0.5 - 1.5 hours	Dependant on the configuration amount

3-2-2 Installation Warnings

1.) Since the Voluson® E8 weighs approximately 130 kg (286.6 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.

To remove the footrest cover, turn the 2 quick release devices below the footrest 90°
(see: Figure 8-17 on page 8-15).

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® E8 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	8	6	4	2	0	0	0	0	0	0	0	2	4	6	8	10	12	14	16	18	20

3-2-2-3 Control Panel Position

If weight is placed on the Control Panel (UI) in it’s extended position the console could tip over.

WARNING ***The system should NOT be moved with the Control Panel (UI) extended. Move the Control Panel to it’s centered and locked position. Refer to Section 6-5 on page 6-8.***

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.**

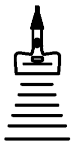
CAUTION **DO NOT wear the ESD wrist strap when you work on live circuits and more than 30 V peak is present.**

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® E8.
Keep manuals near the unit for reference.**

CAUTION **ACOUSTIC OUTPUT HAZARD
Although the ultrasound energy transmitted from the Voluson® E8 ultrasound system is within FDA limitations, avoid unnecessary exposure.
Ultrasound energy can produce heat and mechanical damage.**



ENVIRONMENTAL STORAGE AND SHIPPING CONDITIONS

-10°C to +40°C
+14°F to +104°F

max. 90% RH no condensation

700 to 1060 hPa

Figure 3-2 Environmental Labels

Section 3-3
Receiving and Unpacking the Equipment

CAUTION **Please read this section carefully before unpacking the Voluson® E8 ultrasound system and its (optional) peripherals.**

The Voluson® E8 ultrasound system, together with peripherals, probes and accessories are shipped from the factory in a single durable shipping crate 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® E8.
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® E8 incl. peripherals and accessories	1490 mm / 58.6 inch	780 mm / 30.7 inch	1180 mm / 46.5 inch	196 kg / 432 lbs

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

Before unpacking the unit:

- Inspect the crate for visible damage.
- Inspect the Drop and Tilt Indicator for evidence of accidental shock or tilting during transit (damage incident, see: Figure 3-3 below).

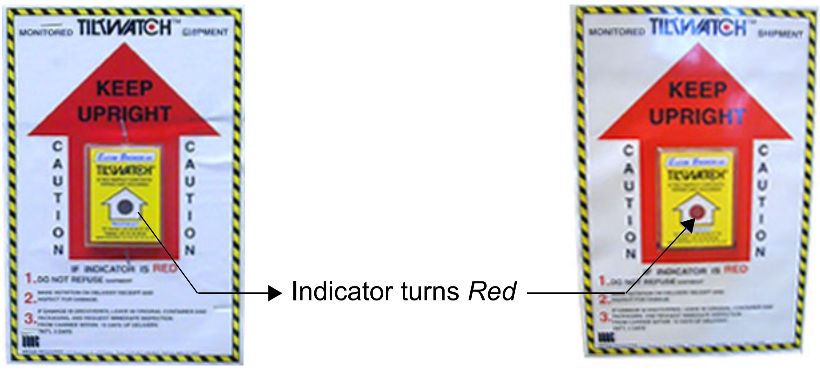


Figure 3-3 Drop and Tilt Indicator

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 If the shipping crate is damaged, please inform the GE Healthcare - Kretztechnik 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

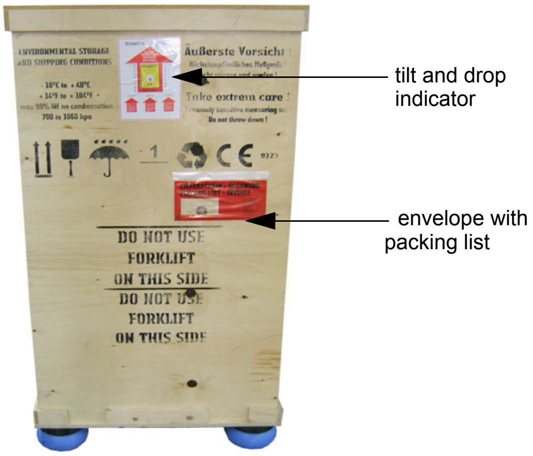
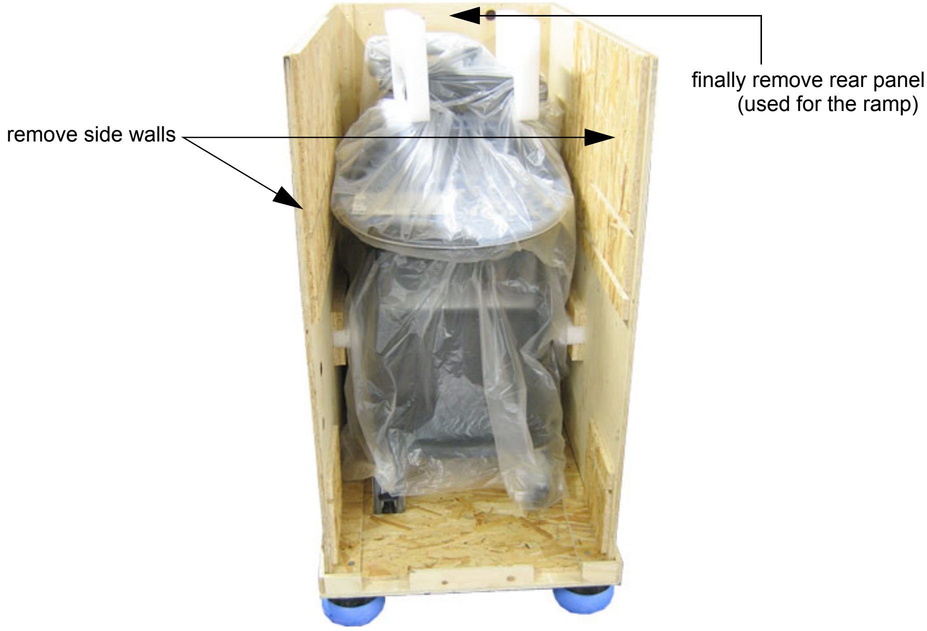
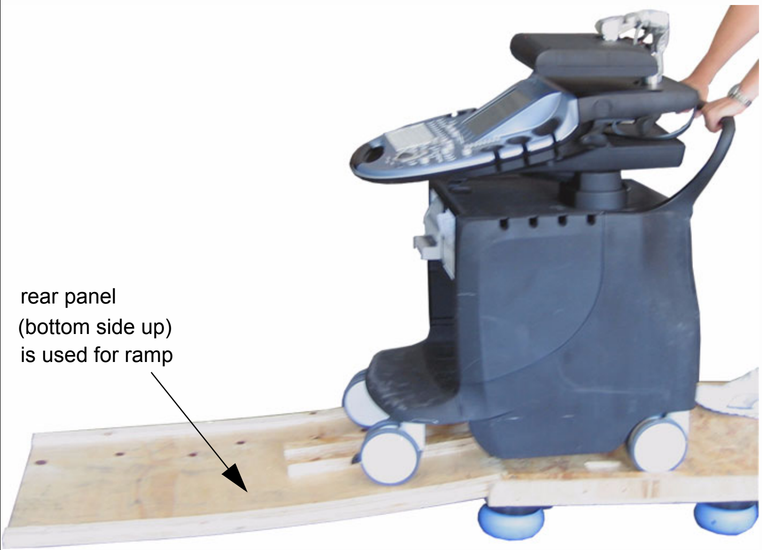
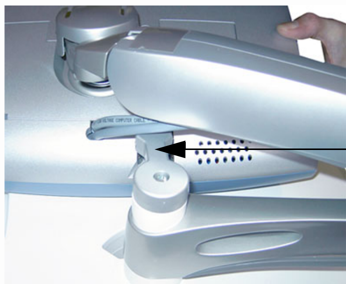
Step	Task
1.	Loosen the screws. **DO NOT** remove the top panel, just place it on the crate (about middle of side walls).   **CAUTION** **DO NOT remove the top panel.**
2.	Take off the front panel, then remove probes and accessories from the wooden box. Afterwards pull out all the horizontal wooden racks for accessories, finally remove also the vertical board.   **CAUTION** **DO NOT open side panels prior to removing the front panel! Accessories could drop down and DAMAGE the user interface!**

Table 3-5 Unpacking Procedure

Step	Task
3.	Remove the left and right side walls, finally remove also the rear panel of the crate; the rear panel is used for the ramp. 
4.	Carefully remove foam packing material and plastic bag from the ultrasound unit and monitor.
Caution: Two people are needed in the next step due to the weight of the equipment.	
5.	Disengage the brakes, grasp the system at the handle, then slowly move unit down the ramp (bottom side of the rear panel).  **NOTICE** THE SYSTEM IS LOWERED TO ITS MINIMUM HEIGHT, WITH MONITOR FLAPPED AND <u>LOCKED DOWN</u>. THE CONTROL CONSOLE IS CENTERED AND LOCKED IN POSITION. 
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® E8 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.
	11	System Voltage setting	Verify that the Voluson® E8 ultrasound system is set to the correct voltage. see: Section 3-4-2 "System Voltage Settings" on page 3-8

NOTE: Report any items that are missing, back-ordered, or damaged, to your GE Healthcare - Kretztechnik sales representative. The contact address is shown in Contact Information on page 1-14.

3-4-2 System Voltage Settings

Verify that the scanner is set to the correct voltage. The Voltage setting for the Voluson® E8 Scanner is found on the identification plate, on the rear of the system.

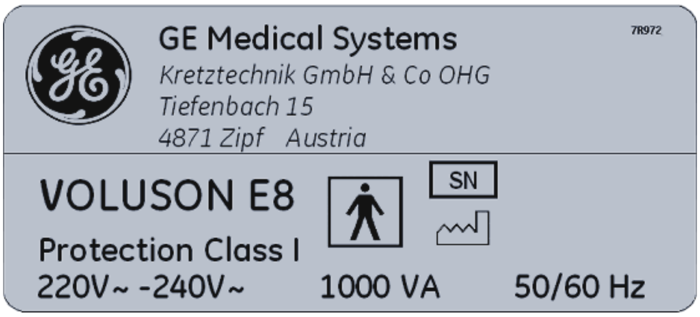


Figure 3-5 Identification Plate

WARNING ***CONNECTING A Voluson® E8 SCANNER TO THE WRONG VOLTAGE LEVEL WILL MOST LIKELY DESTROY THE SCANNER.***

3-4-3 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® E8 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 Voluson® E8 hardware installation procedures described in the sub-sections.

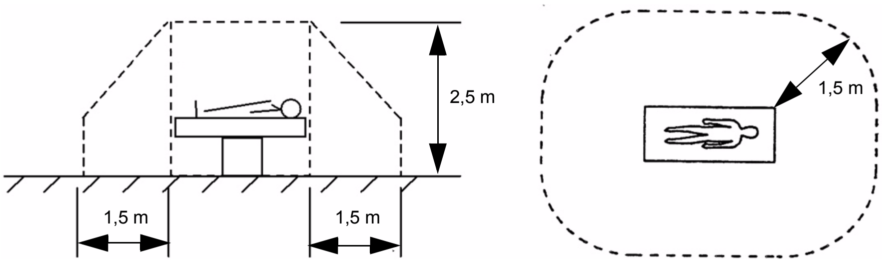
Table 3-7 Connection Procedures

NOTICE It is impossible to attach a Black&White printer, a Color printer and a DVR in the console at the same time, as there is not enough space for them all.
At the left shelf you can place either a color printer or a DVD recorder (DVR).

NOTICE The VideoCassette Recorder (VCR) has to be located on external position (e.g., cupboard next to the Voluson® E8 system, see: Figure 3-17 on page 3-23).
DO NOT put it on the top cover. It could be damaged when lowering the control console.

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® E8 system, please review: Chapter 1 - Auxiliary Devices Safety, on page 1-9.*

3-5-1 Connecting the LCD Monitor

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

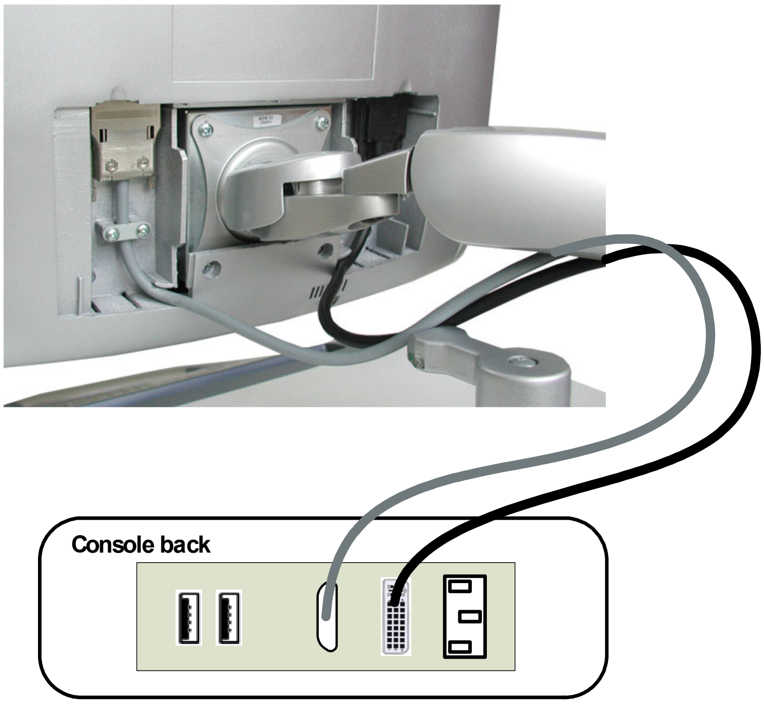


Figure 3-6 Connection Scheme - LCD Monitor

3-5-2 Connecting the Black & White Printer

1.) Power OFF/Shutdown the system as described in: Section 3-6-3 on page 3-50.
2.) Connect the Black & White printer according to correct connection scheme.

BT Version: Please observe that connection schemes depend on BT-version of the Voluson® E8 system.

- **BT06** (SW 6.x.x installed):
  - if "**Kontron**" PC-Motherboard is installed, see: Figure 3-7 on page 3-12
  - if "**Tyan**" PC-Motherboard is installed, see: Figure 3-8 on page 3-13
- **BT08** (SW 7.x.x installed):
  - if "**Kontron Dual-core**" PC-Motherboard is installed, see: Figure 3-9 on page 3-14
  - if "**DFI Dual-core**" PC-Motherboard is installed, see: Figure 3-10 on page 3-15

*NOTE: The Black & White printer should be connected to the **USB3** port of the Voluson® E8´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® E8 system as described in Section 3-6-2 on page 3-47.
All software drivers are pre-installed for the designated Black & White printer only.
5.) After physical connection to the Voluson® E8 system, assign the printer to a remote key (**P1**, **P2**, **P3** and/or **P4**) as described in Section 3-7-5 "Remote Control Selection" on page 3-65.

NOTICE If the printer driver - contrary to expectations - is not pre-installed (print test image for verification) follow installation instructions as described in *Section 3-7-1 on page 3-53*.

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 to KONTRON (BT06)

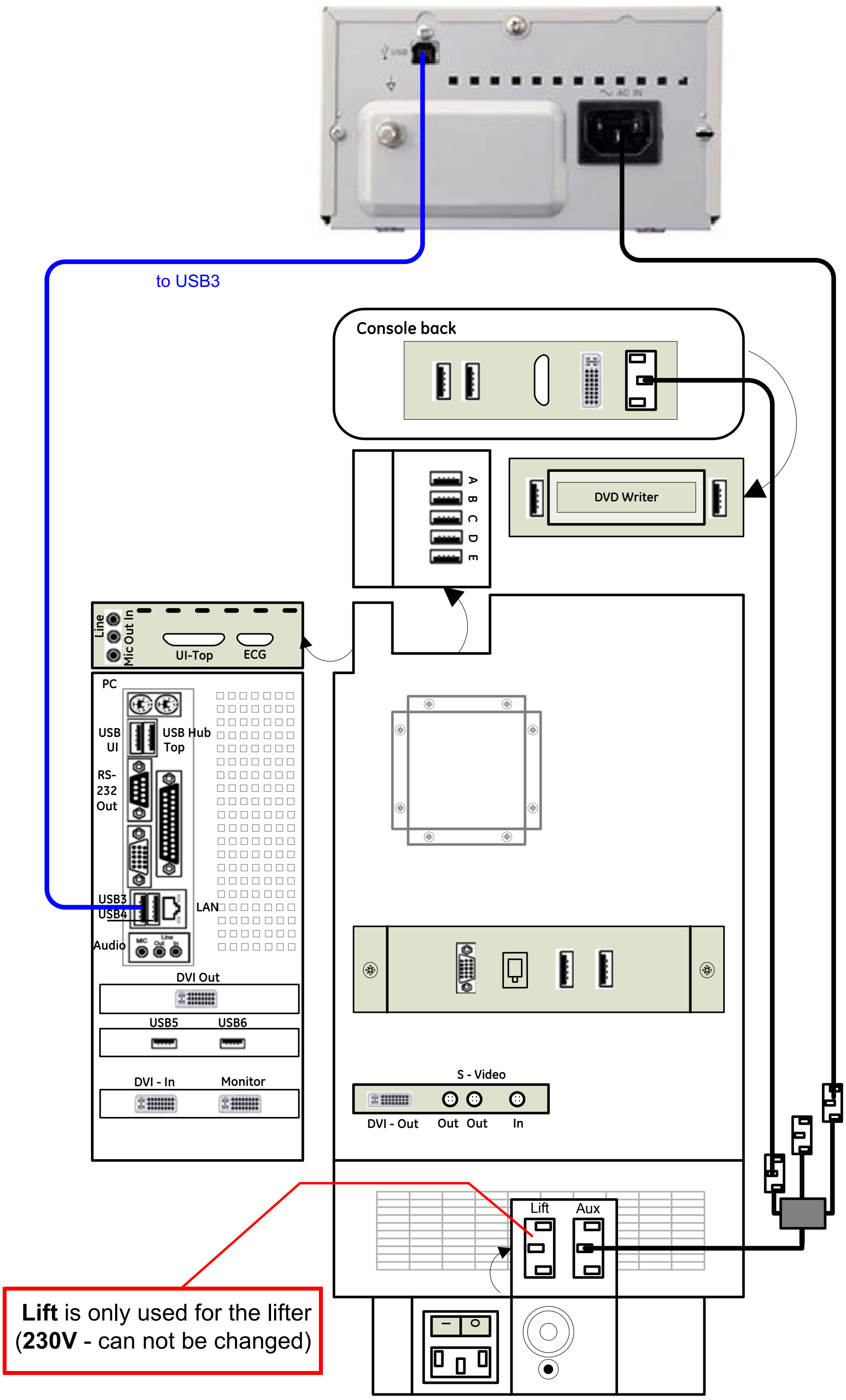


Figure 3-7 Black & White Printer connection (BT06: KONTRON PC-Motherboard installed)

3-5-2-2 Connection Scheme: B&W Printer to TYAN (BT06)

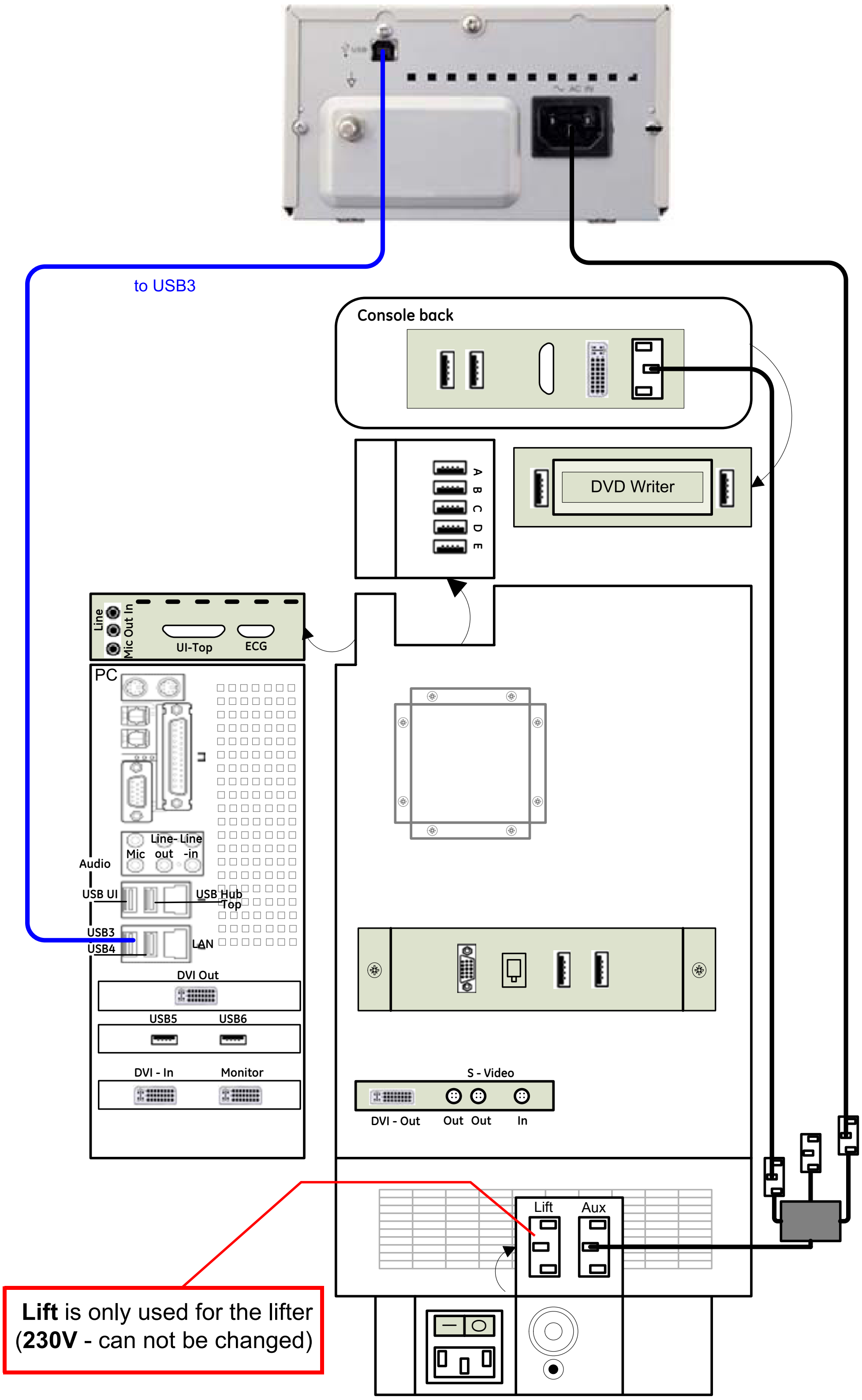


Figure 3-8 B&W Printer connection (BT06: TYAN PC-Motherboard installed)

3-5-2-3 Connection Scheme: B&W Printer to KONTRON Dual-core (BT08)

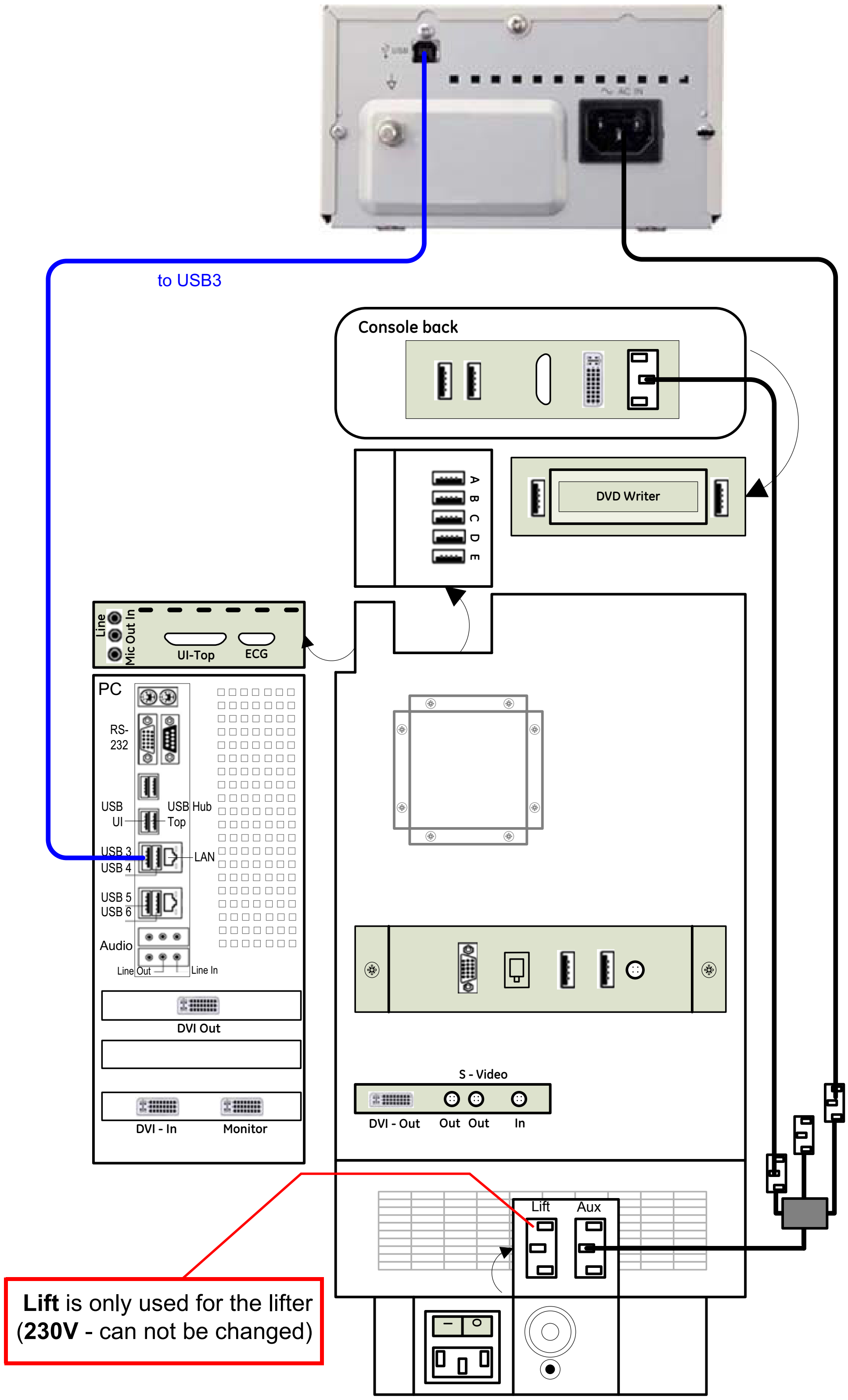


Figure 3-9 B&W Printer connection (BT08: KONTRON Dual-core PC-Motherboard installed)

3-5-2-4 Connection Scheme: B&W Printer to DFI Dual-core (BT08)

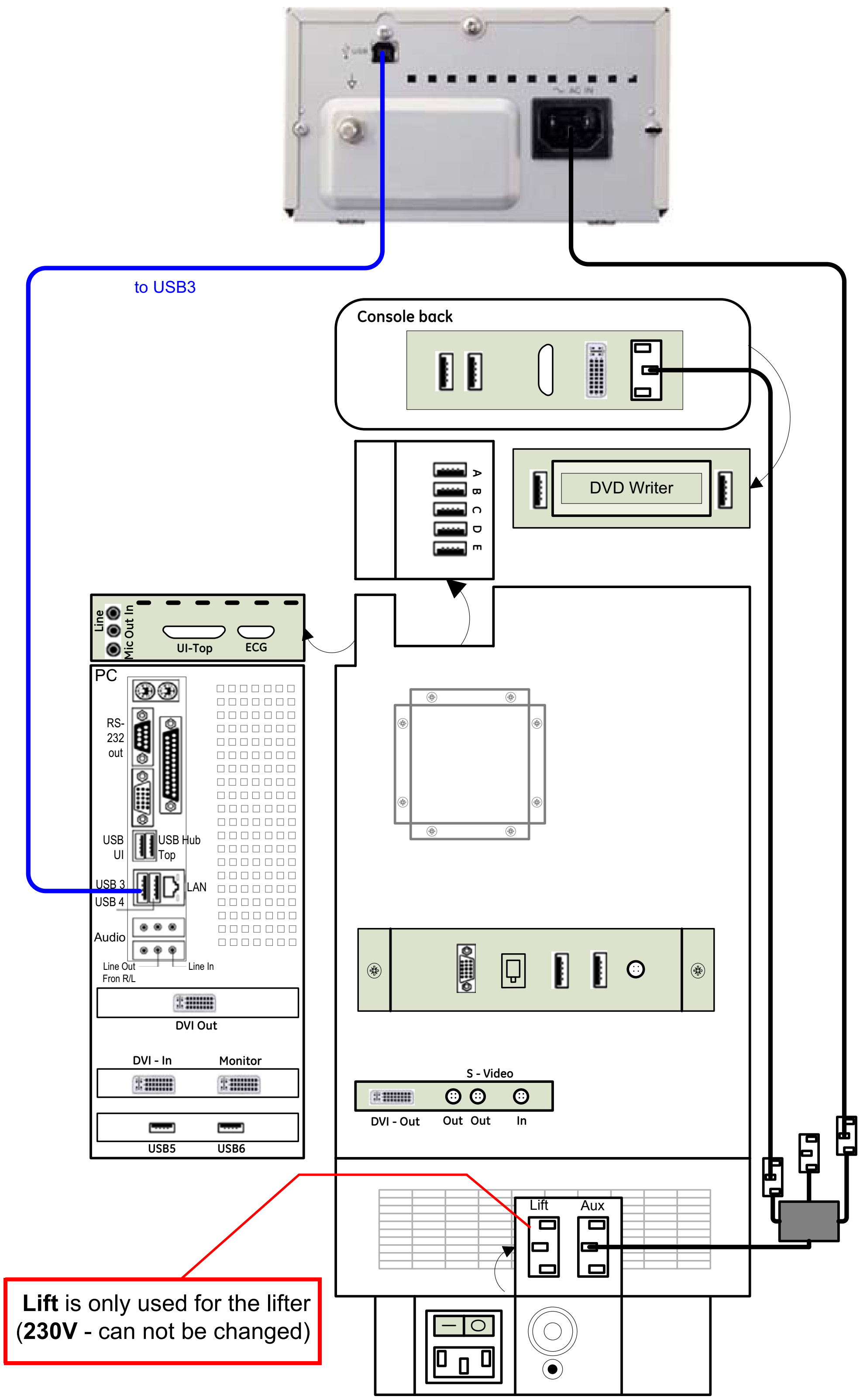


Figure 3-10 B&W Printer connection (BT08: DFI Dual-core PC-Motherboard installed)

3-5-3 Connecting the Color Printer

1.) Power OFF/Shutdown the system as described in: Section 3-6-3 on page 3-50.
2.) Connect the Color printer according to correct connection scheme.

BT Version: Please observe that connection schemes depend on BT-version of the Voluson® E8 system.

- **BT06** (SW 6.x.x installed):
  - if **"Kontron"** PC-Motherboard is installed, see: Figure 3-11 on page 3-17.
  - if **"Tyan"** PC-Motherboard is installed, see: Figure 3-12 on page 3-18.
- **BT08** (SW 7.x.x installed):
  - if **"Kontron Dual-core"** PC-Motherboard is installed, see: Figure 3-13 on page 3-19.
  - if **"DFI Dual-core"** PC-Motherboard is installed, see: Figure 3-14 on page 3-20.

*NOTE: The Color printer should be connected to the **USB4** port of the Voluson® E8´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® E8 system as described in Section 3-6-2 on page 3-47.
All software drivers are pre-installed for the designated Color printer only.
5.) After physical connection to the Voluson® E8 system, assign the printer to a remote key (**P1**, **P2**, **P3** and/or **P4**) as described in Section 3-7-5 "Remote Control Selection" on page 3-65.

NOTICE If the printer driver - contrary to expectations - is not pre-installed (print test image for verification) follow installation instructions as described in *Section 3-7-2 on page 3-55.*

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 to KONTRON (BT06)

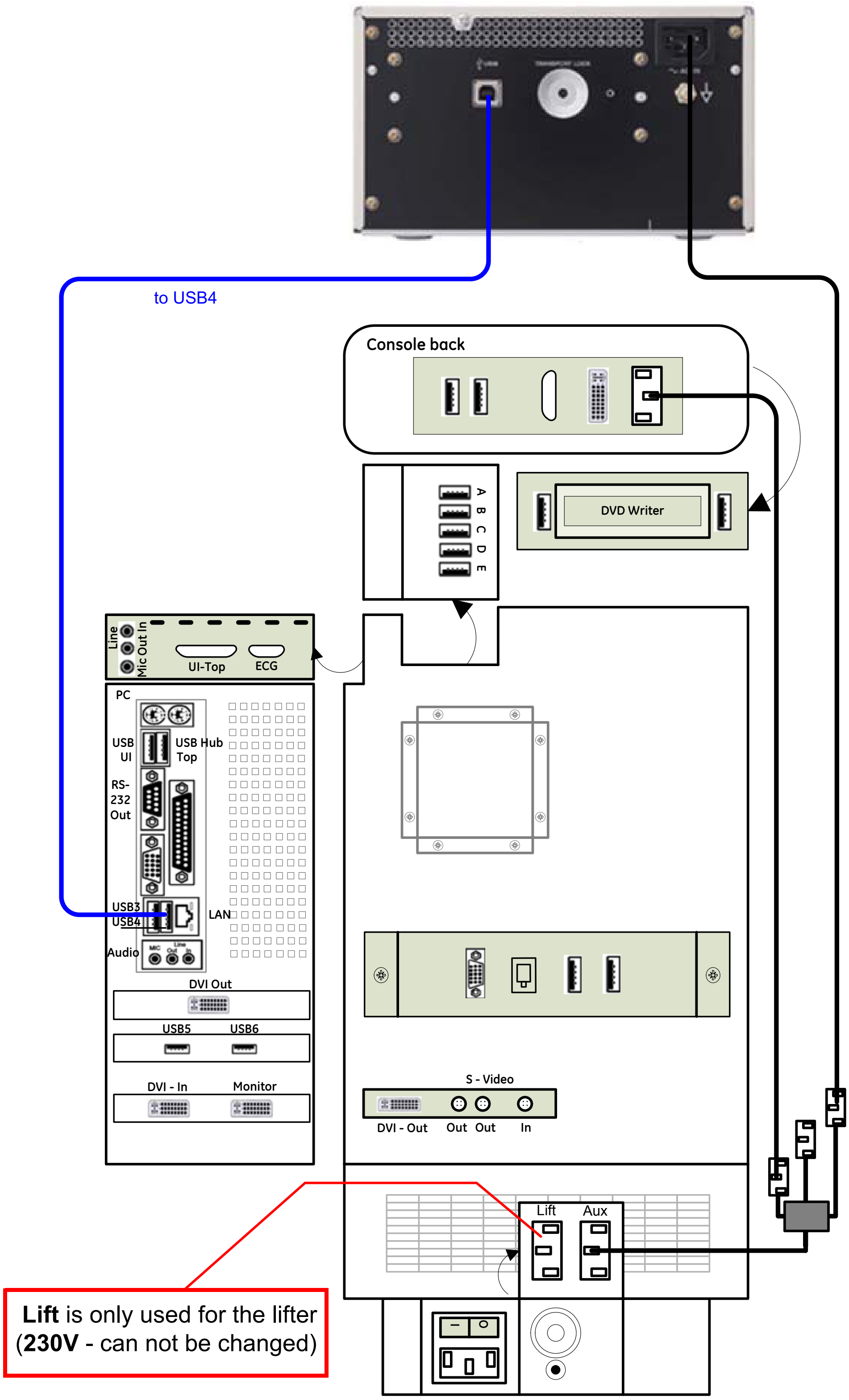


Figure 3-11 Color Printer connection (BT06: KONTRON PC-Motherboard installed)

3-5-3-2 Connection Scheme: Color Printer to TYAN (BT06)

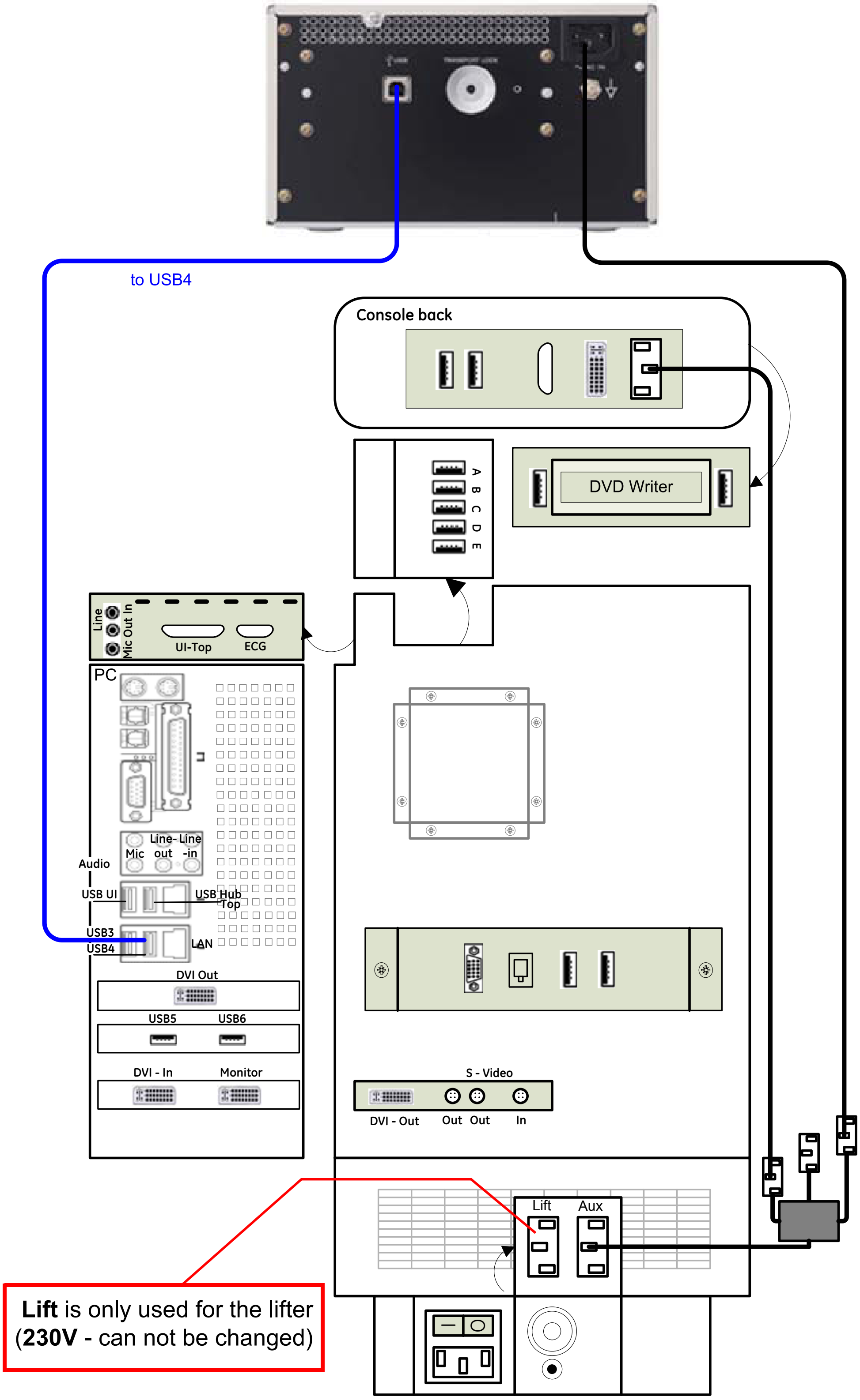


Figure 3-12 Color Printer connection (BT06: TYAN PC-Motherboard installed)

3-5-3-3 Connection Scheme: Color Printer to KONTRON Dual-core (BT08)

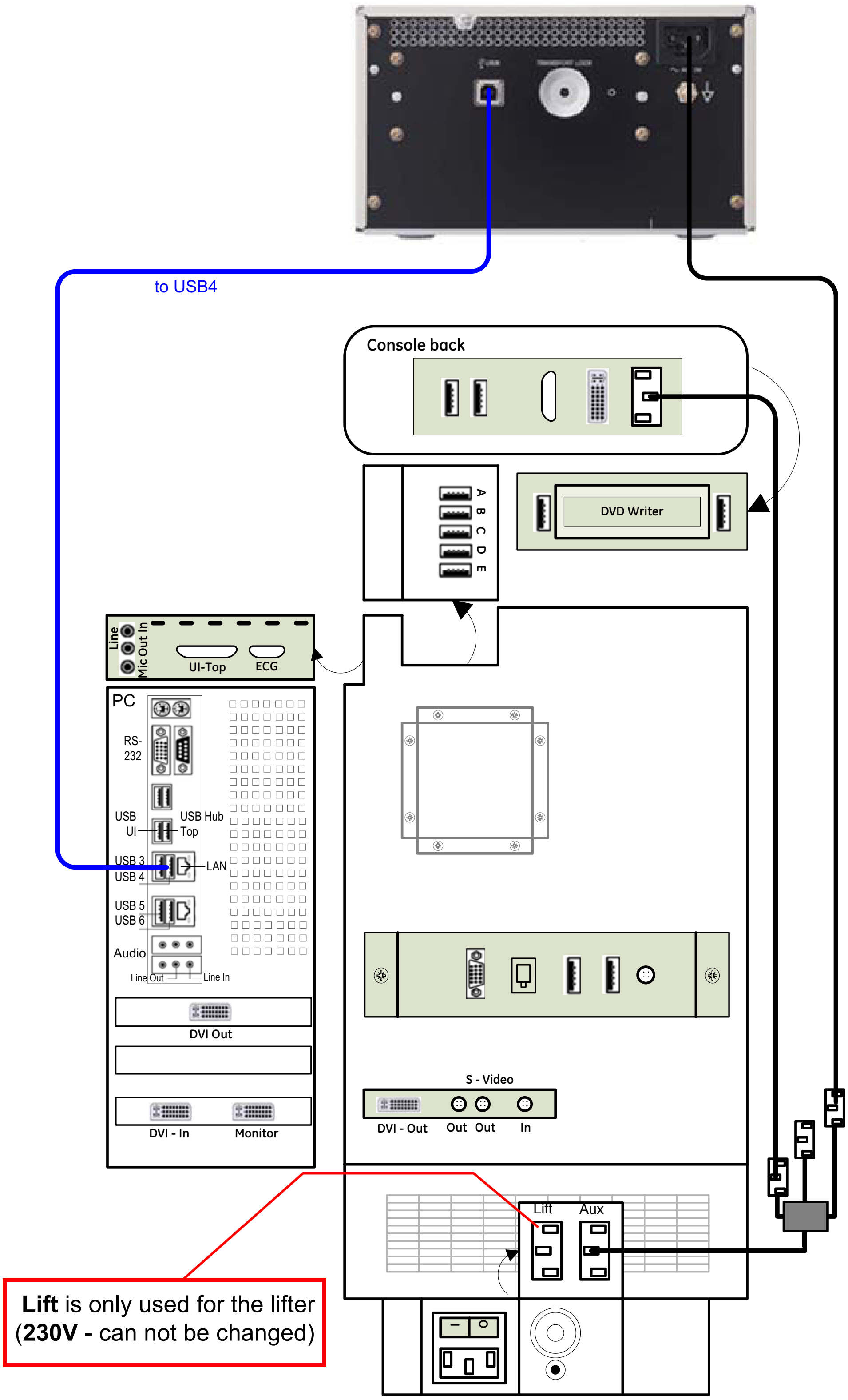


Figure 3-13 Color Printer connection (BT08: KONTRON Dual-core PC-Motherboard installed)

3-5-3-4 Connection Scheme: Color Printer to DFI Dual-core (BT08)

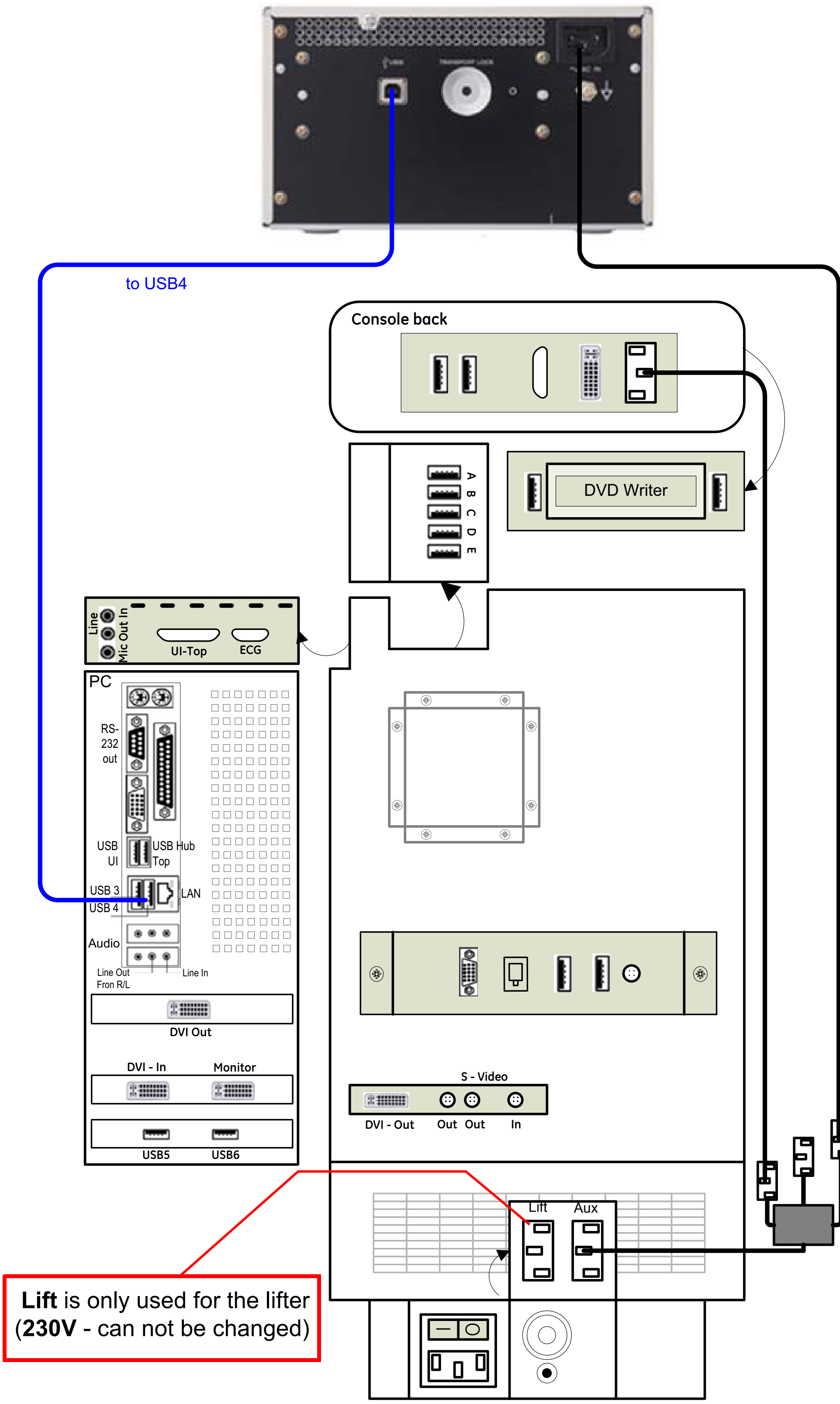


Figure 3-14 Color Printer connection (BT08: DFI Dual-core PC-Motherboard installed)

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 port **E** on the RTB Distribution Board Bottom.

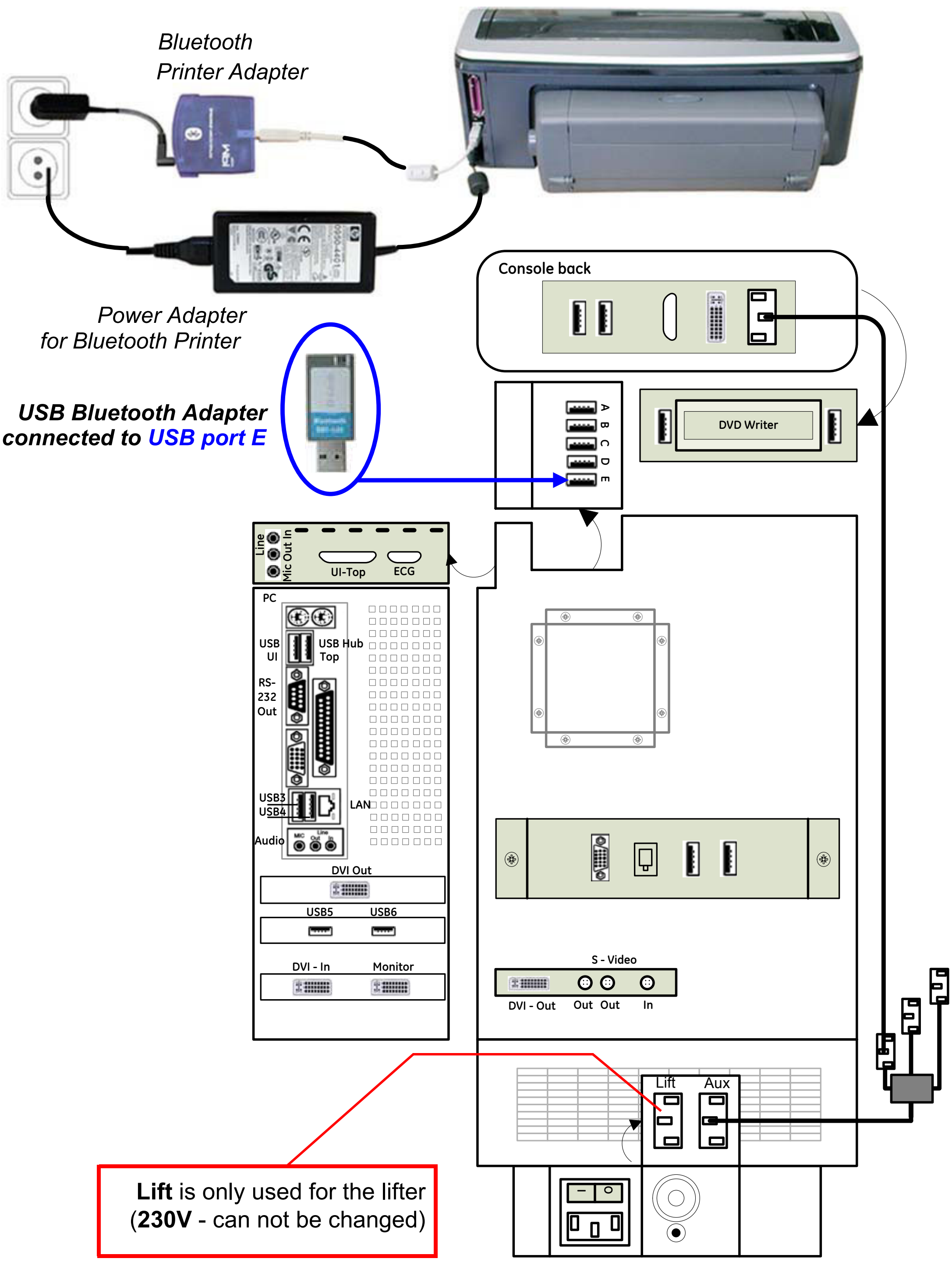


Figure 3-15 HP5940 DeskJet Printer connection (via Bluetooth Adapter)

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

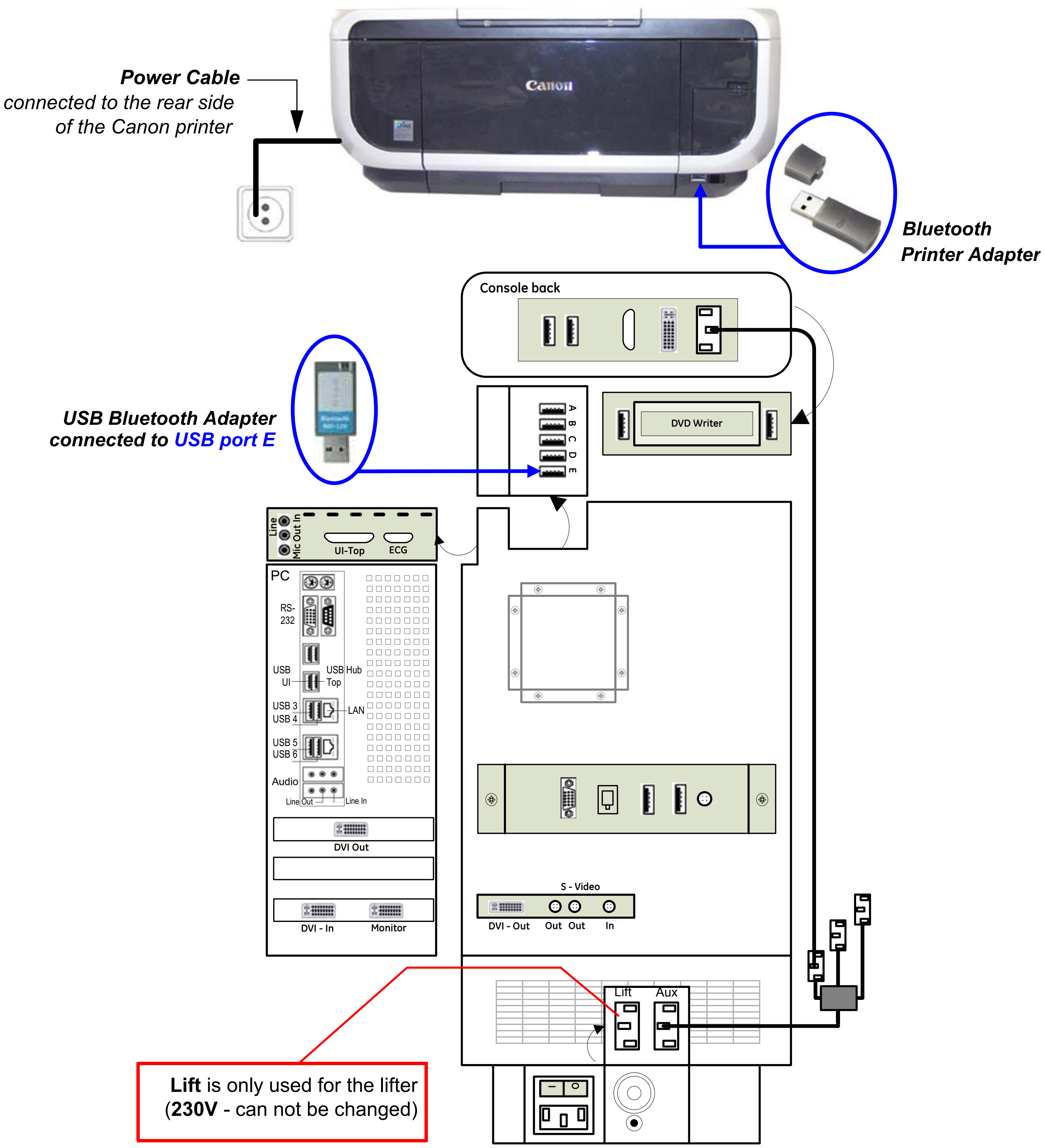


Figure 3-16 Canon Pixma MP600/MP610 DeskJet Printer connection (via Bluetooth Adapter)

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, on page 9-31.

3-5-5 Connecting the VCR (VideoCassette Recorder)

NOTE: There are two types of Mitsubishi HS-MD3000 VCR (PAL and NTSC) approved by GE Healthcare - Kretztechnik. Use the standard VCR type (PAL or NTSC) that is suited to your region.

⚠ **NOTICE**

The VCR has to be located on external position (e.g., cupboard next to the Voluson® E8 system).
DO NOT put it on the top cover!
It could be damaged when lowering the control console.

Figure 3-17 VCR located on external position

3-5-5 Connecting the VCR (VideoCassette Recorder) (cont'd)

1.) Power OFF/Shutdown the system as described in: Section 3-6-3 on page 3-50.

2.) Set DIP switches:
Remove screw A & B, pull the plate out of the VCR, set switch number **7** to **ON**.
(The others must be switched OFF.) Reassemble the plate on the VCR.

3.) Connect the VCR according to correct connection scheme.

BT Version: Please observe that connection schemes depend on BT-version of the Voluson® E8 system.

- **BT06** (SW 6.x.x installed):
  - if **"Kontron"** PC-Motherboard is installed, see: Figure 3-18 on page 3-25.
  - if **"Tyan"** PC-Motherboard is installed, see: Figure 3-19 on page 3-26.
- **BT08** (SW 7.x.x installed):
  - if **"Kontron Dual-core"** PC-Motherboard is installed, see: Figure 3-20 on page 3-27.
  - if **"DFI Dual-core"** PC-Motherboard is installed, see: Figure 3-21 on page 3-28.

*NOTE: The VCR should be connected to the **USB port A** of the RTB Distribution board inside the Voluson® E8.*

4.) When all power and signal cables are connected to the system and VCR, proceed as follows:

a.) Press the power ON switch on the VCR.

b.) Turn ON the power of the Voluson® E8 system.

5.) After physical connection to the Voluson® E8 system:

a.) Check and if necessary change the Video Norm, see: Section 3-8-1-6 on page 3-69.

b.) Check and if necessary change the Recorder Type, see: Section 3-8-1-7 on page 3-69.

c.) Assign the VCR recorder control to a remote key **P1**, **P2**, **P3** and/or **P4** as described in Section 3-7-5 "Remote Control Selection" on page 3-65.

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

3-5-5-1 Connection Scheme: VCR to KONTRON (BT06)

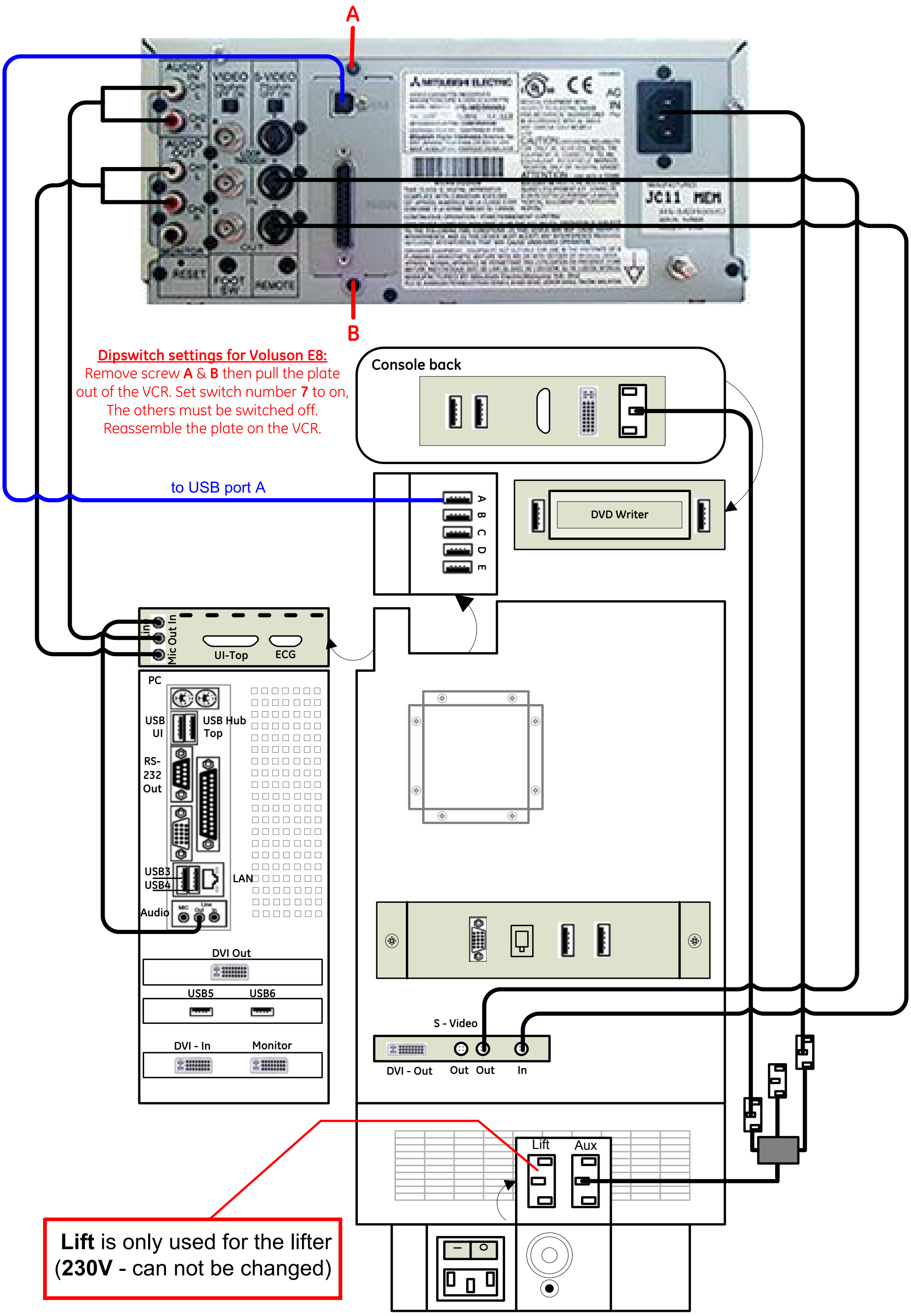


Figure 3-18 Video Recorder connection (BT06: KONTRON PC-Motherboard installed)

3-5-5-2 Connection Scheme: VCR to TYAN (BT06)

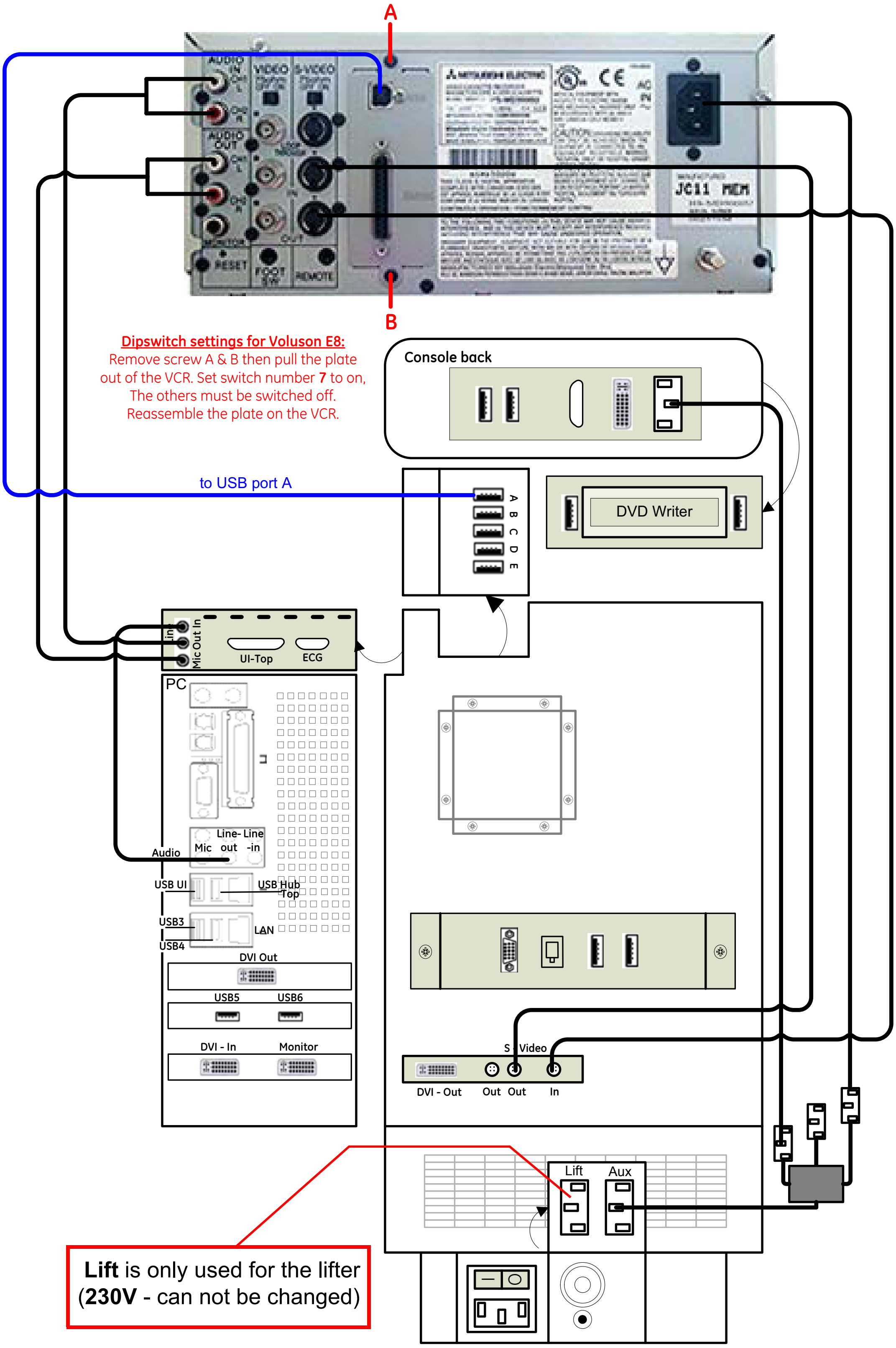


Figure 3-19 Video Recorder connection (BT06: TYAN PC-Motherboard installed)

3-5-5-3 Connection Scheme: VCR to KONTRON Dual-core (BT08)

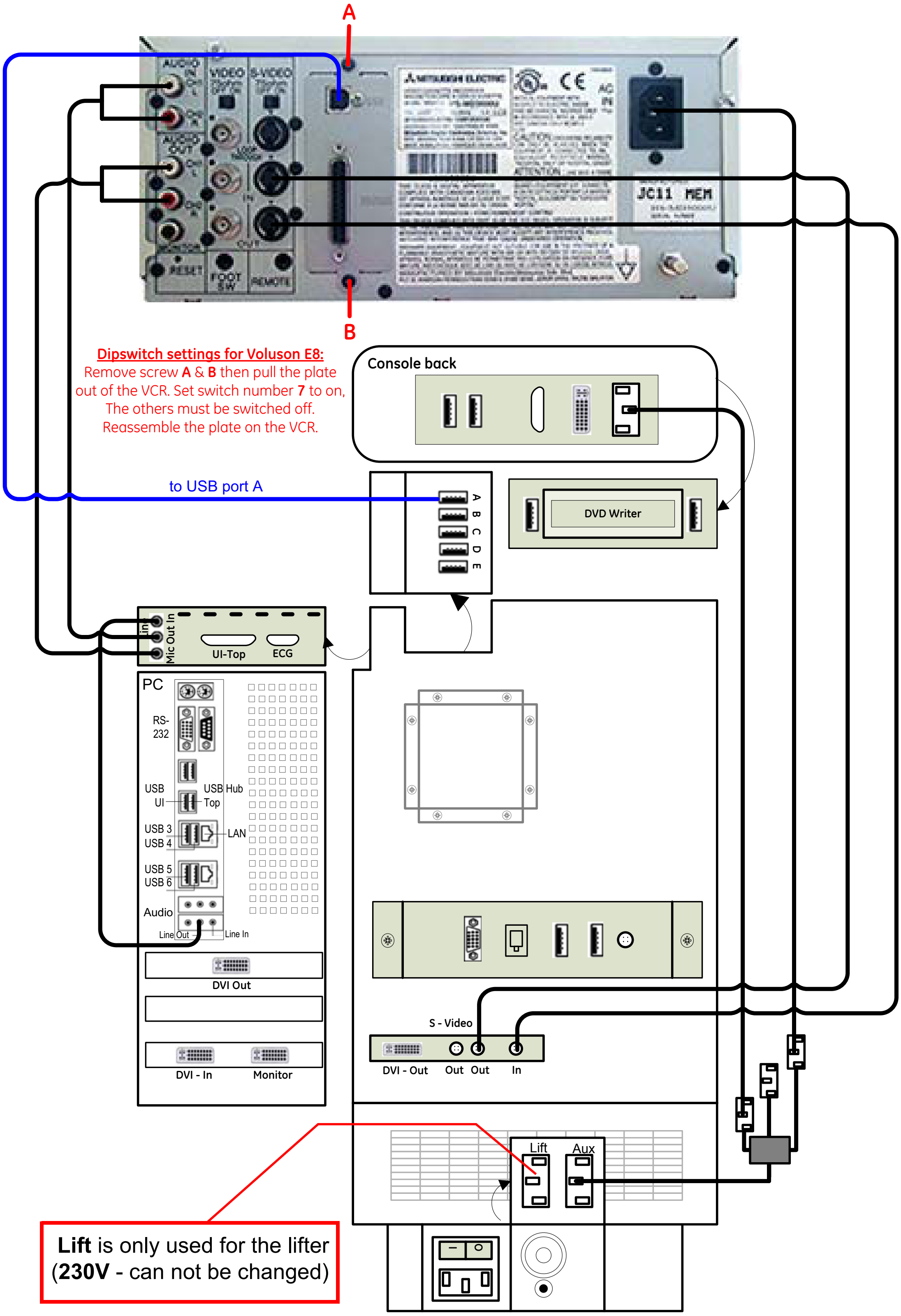


Figure 3-20 Video Recorder connection (BT08: KONTRON Dual-core PC-Motherboard installed)

3-5-5-4 Connection Scheme: VCR to DFI Dual-core (BT08)

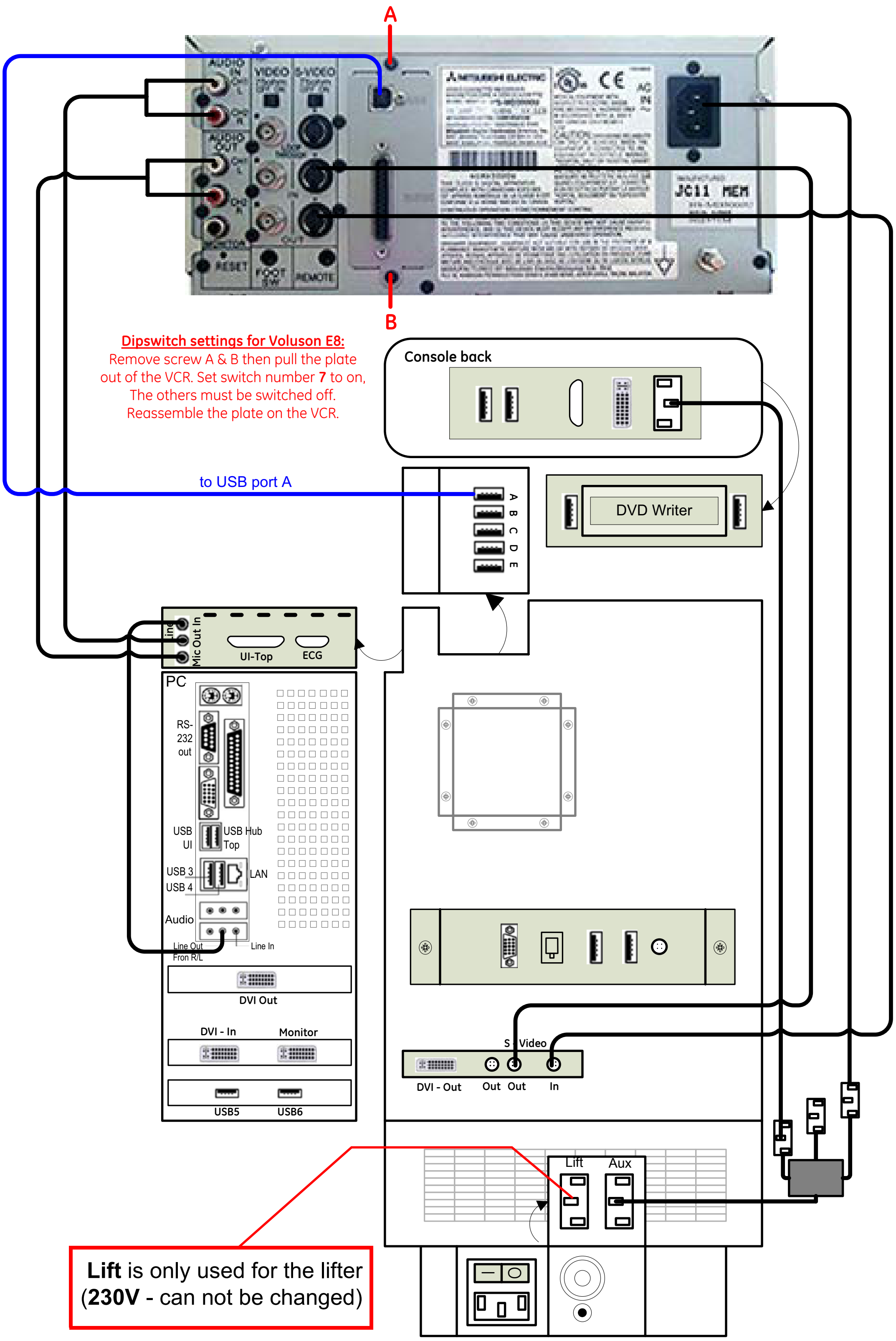


Figure 3-21 Video Recorder connection (BT08: DFI Dual-core PC-Motherboard installed)

3-5-6 Connecting the DVR (DVD Recorder)

NOTICE The Sony DVO-1000MD DVD recorder is **only** able to read and write on DVD**+RW** (ReWriteable) media! Please check on your DVD case before using.

1.) Power OFF/Shutdown the system as described in: Section 3-6-3 on page 3-50.
2.) Connect the DVD Recorder according to correct connection scheme.

BT Version: Please observe that connection schemes depend on BT-version of the Voluson® E8 system.

- **BT06** (SW 6.x.x installed):
  - if **"Kontron"** PC-Motherboard is installed, see: Figure 3-22 on page 3-30.
  - if **"Tyan"** PC-Motherboard is installed, see: Figure 3-23 on page 3-31.
- **BT08** (SW 7.x.x installed):
  - if **"Kontron Dual-core"** PC-Motherboard is installed, see: Figure 3-24 on page 3-32.
  - if **"DFI Dual-core"** PC-Motherboard is installed, see: Figure 3-25 on page 3-33.

*NOTE: The DVD recorder should be connected to the **USB port A** of the RTB Distribution board inside the Voluson® E8.*

3.) When all power and signal cables are connected to the system and DVD recorder, proceed as follows:
   a.) Press the power ON switch on the DVD recorder.
   b.) Turn ON the power of the Voluson® E8 system.
4.) After physical connection to the Voluson® E8 system:
   a.) Adjust the DVD Recorder settings as described in Section 3-5-6-5 on page 3-34.
   b.) Check and if necessary change the Video Norm, see: Section 3-8-1-6 on page 3-69.
   c.) Check and if necessary change the Recorder Type, see: Section 3-8-1-7 on page 3-69.
   d.) Assign the recorder control to a remote key **P1**, **P2**, **P3** and/or **P4** as described in Section 3-7-5 "Remote Control Selection" on page 3-65.

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

3-5-6-1 Connection Scheme: DVR to KONTRON (BT06)

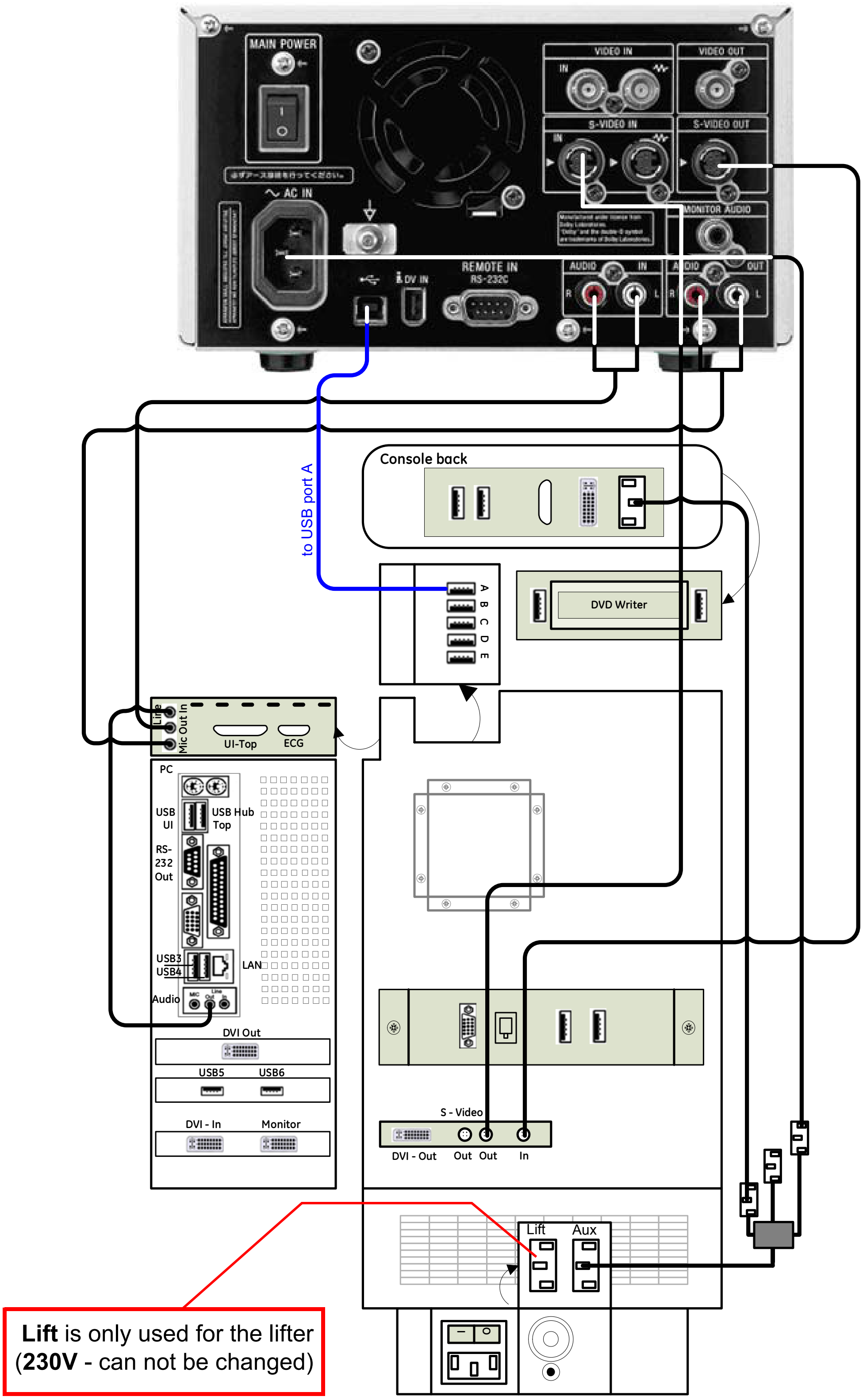


Figure 3-22 DVD Recorder connection (BT06: KONTRON PC-Motherboard installed)

3-5-6-2 Connection Scheme: DVR to TYAN (BT06)

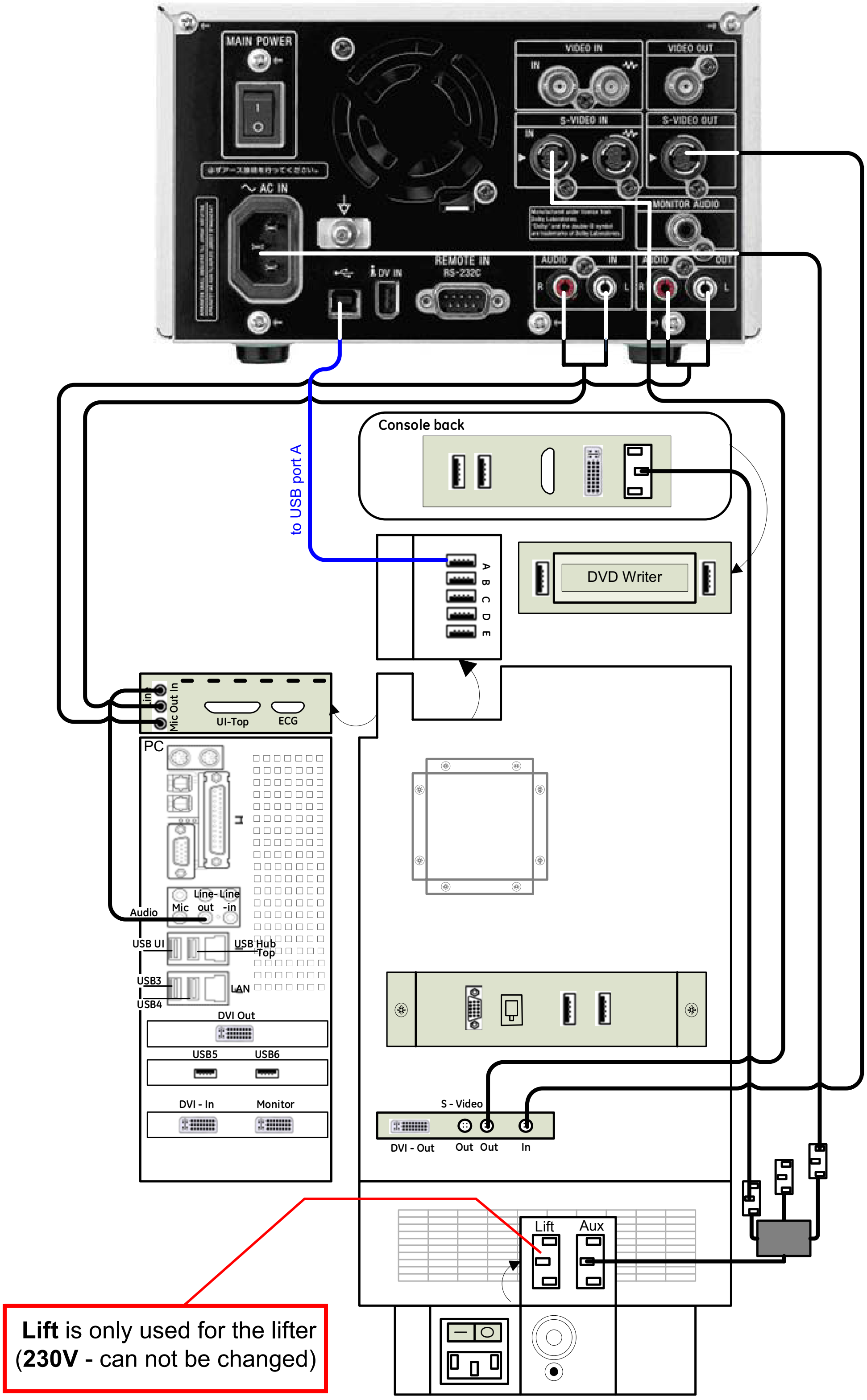


Figure 3-23 DVD Recorder connection (BT06: TYAN PC-Motherboard installed)

3-5-6-3 Connection Scheme: DVR to KONTRON Dual-core (BT08)

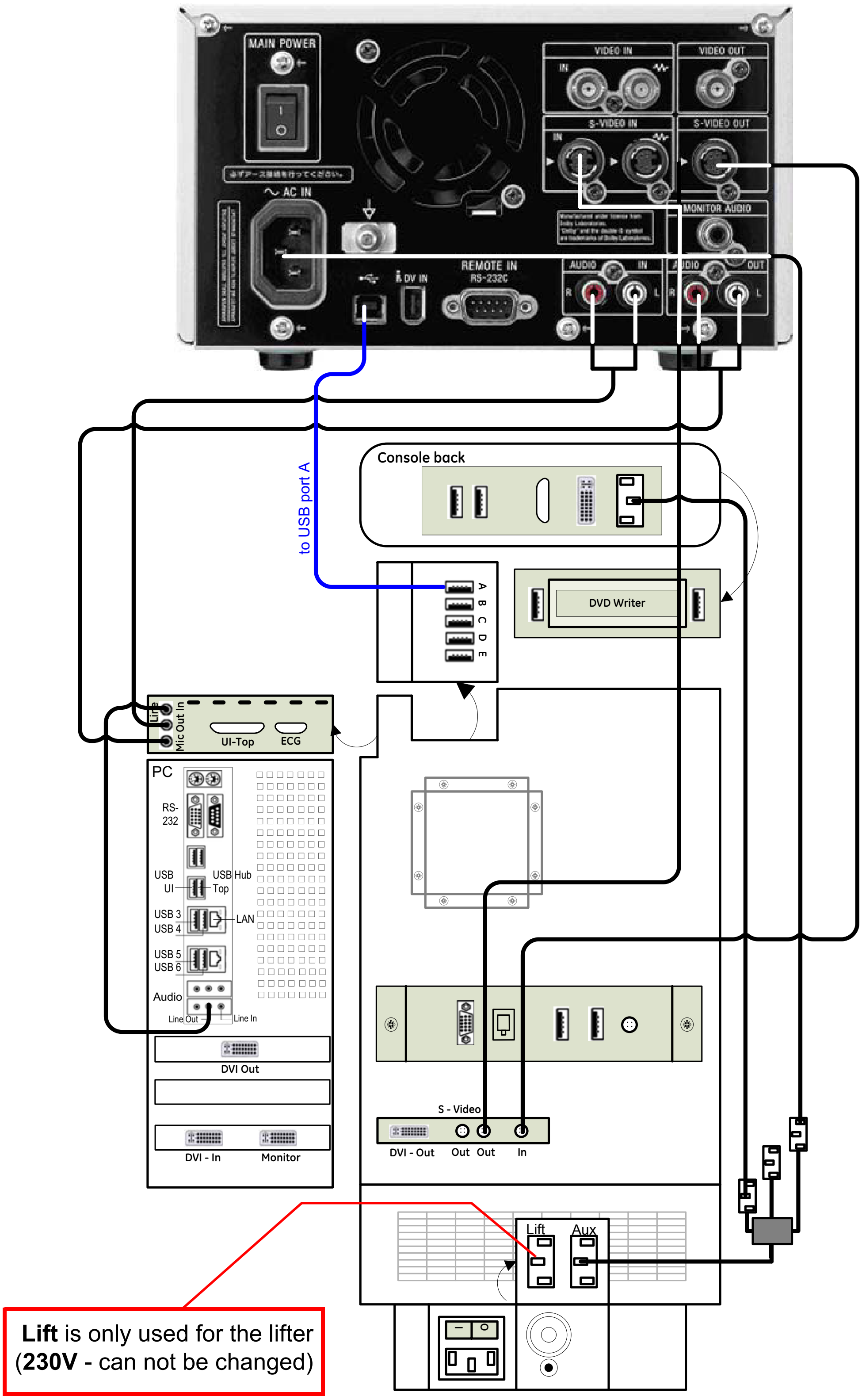


Figure 3-24 DVD Recorder connection (BT08: KONTRON Dual-core PC-Motherboard installed)

3-5-6-4 Connection Scheme: DVR to DFI Dual-core (BT08)

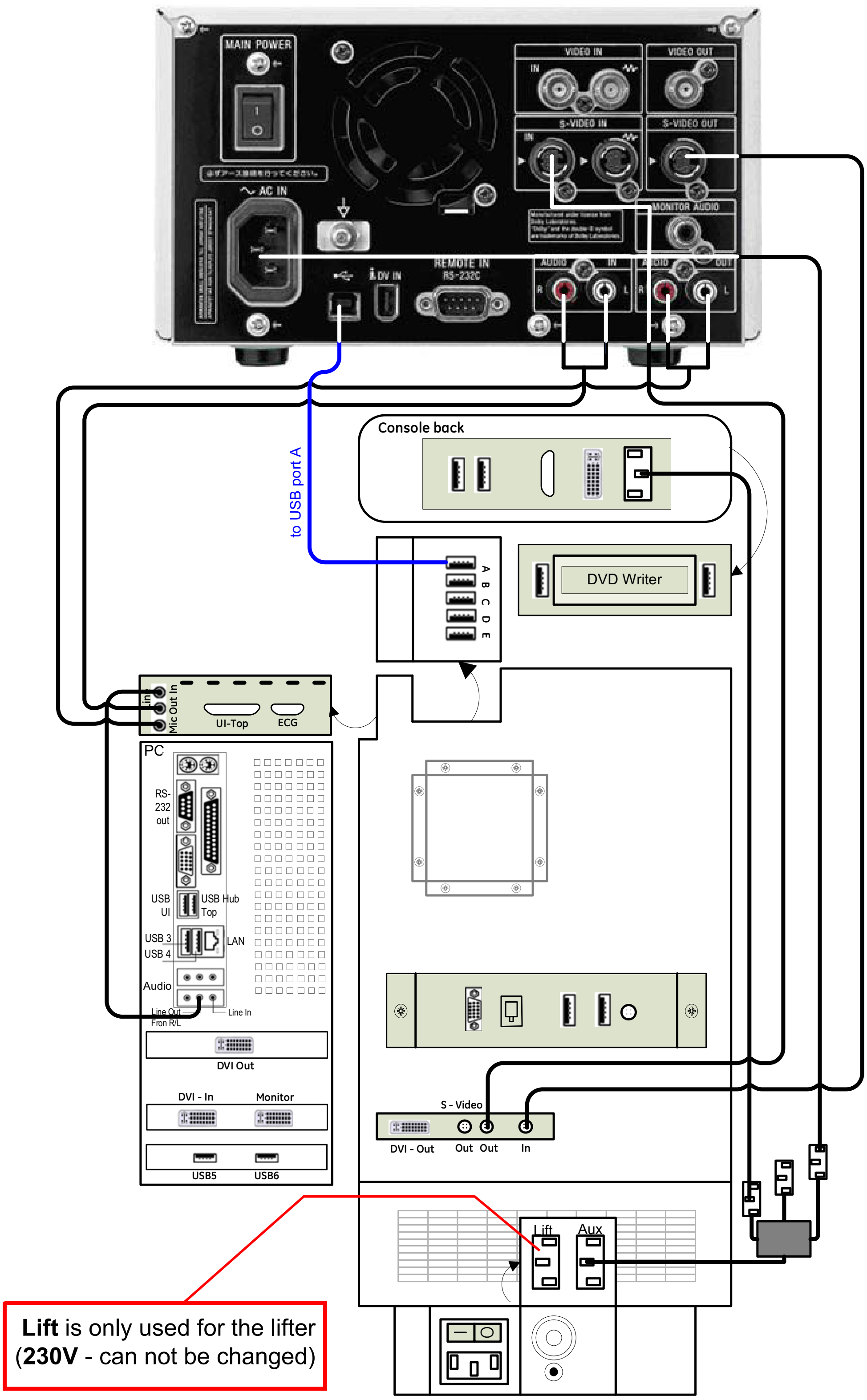


Figure 3-25 DVD Recorder connection (BT08: DFI Dual-core PC-Motherboard installed)

3-5-6-5 Adjustment of the DVD Recorder Settings

TIP: *If you press the **UTILITIES** key on the Voluson® E8 console and then EXT.VIDEO, you will see the actual screens (as shown here in this manual). You can use the on-screen programming menu's instead of the LCD to setup the DVR. This ensures that all cables have been properly connected first!*

3-5-6-5-1 Changing the Remote Interface to USB

1.) If not already done, switch on the Sony DVO-1000MD DVD recorder.
2.) Press the **MENU** button **(A)** located on the front of the DVD recorder see Figure 3-26 below.

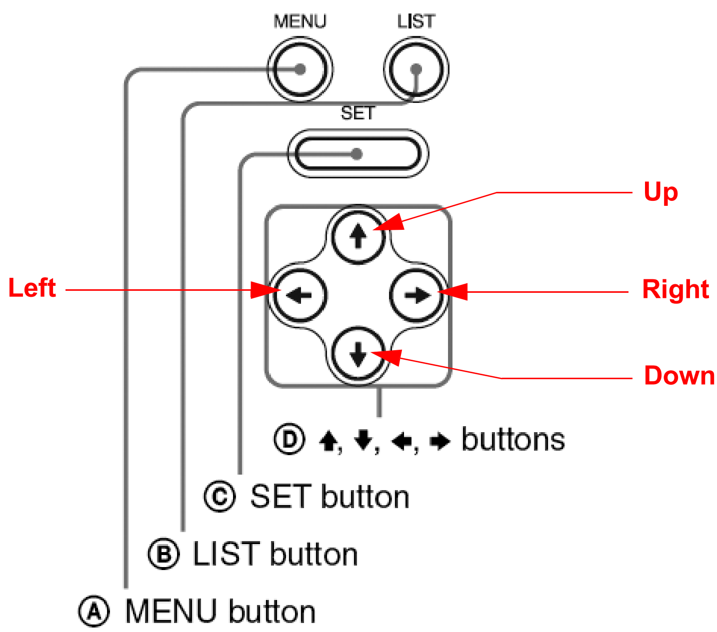


Figure 3-26 Keys on the front of the recorder

3.) The “Main Menu” appears on the LCD screen of the DVD recorder, see: Figure 3-27 below.

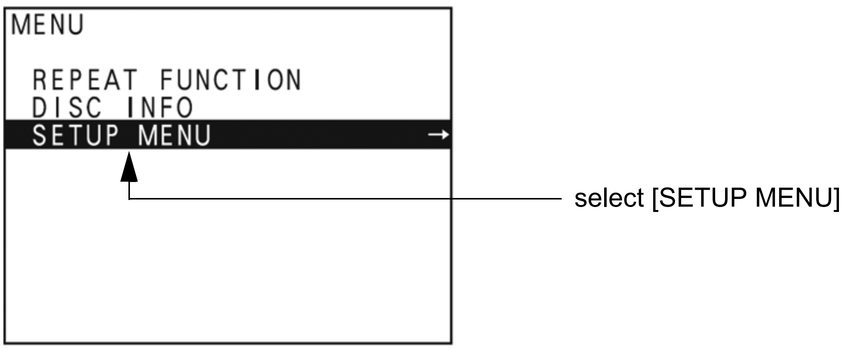


Figure 3-27 “Main Menu” - [SETUP MENU] highlighted

4.) Press the ↧ (down) button on the front of the recorder repeatedly until the [SETUP MENU] item is highlighted.

NOTE: Each time you press the ↥ (up) or ↧ (down) button, the highlight cursor moves up/down item by item.

5.) Press the ⇒ (right) button. The “Setup Menu” appears.

6.) Press the ↧ (down) button on the front of the recorder repeatedly until [REMOTE I/F] is highlighted, see Figure 3-30 on page 3-36.

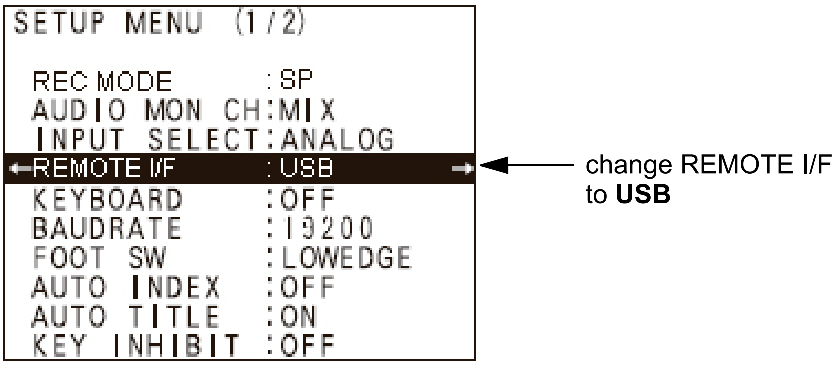


Figure 3-28 "Main Menu" - [REMOTE I/F] highlighted

7.) Press the → (right) button to enter the REMOTE I/F menu.
8.) Press the ↧ (down) button until you see **USB** on the screen.
9.) Press the **SET** button **(C) -** on the front of the DVR - to select USB.

Your DVD recorder is now using USB Remote Interface.

3-5-6-5-2 Changing TV System (Video Format)

NOTE: To check Video format needed, see: Table 3-8, "TV-System and Region Code," on page 3-37.

1.) If not already done, switch on the Sony DVO-1000MD DVD recorder.
2.) Press the **MENU** button **(A)** located on the front of the DVR, see: Figure 3-26 on page 3-34.
3.) The "Main Menu" appears on the LCD screen of the DVD recorder, see: Figure 3-29 below.

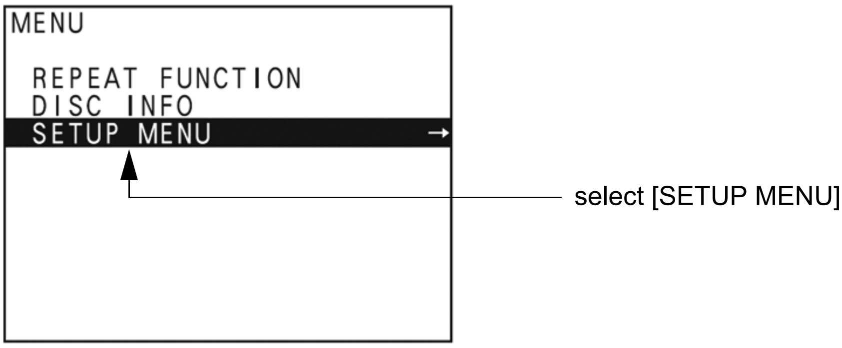


Figure 3-29 "Main Menu" - [SETUP MENU] highlighted

4.) Press the ↧ (down) button on the front of the recorder repeatedly until the [SETUP MENU] item is highlighted.
5.) Press the → (right) button. The "Setup Menu" appears, see Figure 3-30 on page 3-36.

6.) Press the ↓ (down) button repeatedly, until [MENU GRADE] is highlighted.

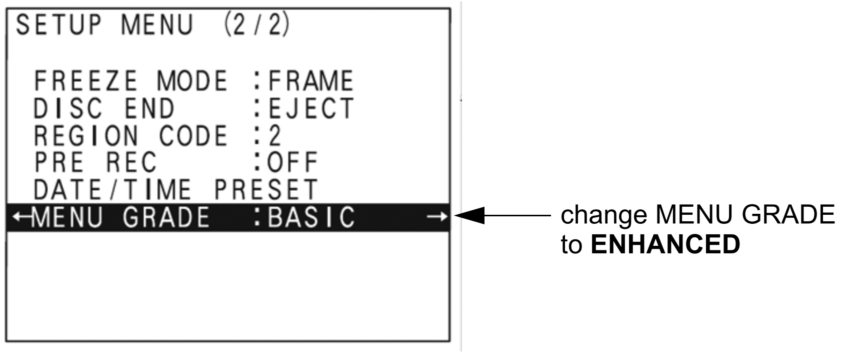


Figure 3-30 "Setup Menu" - [MENU GRADE] highlighted

7.) Press the → (right) button and select [ENHANCED].

8.) Press the ← (left) button, to exit the "Menu Grade" menu.

NOTE: Now additional items (see: Figure 3-31 on page 3-36) are displayed in the "Setup Menu".

9.) Select [TV SYSTEM] by pressing the ↓ (down) button.

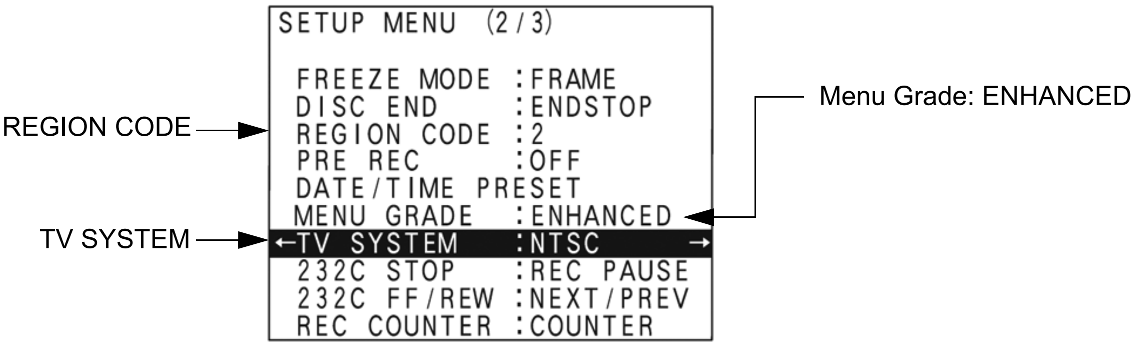


Figure 3-31 "Setup Menu" - [TV SYSTEM] highlighted

10.) Press the → (right) button. The "TV System" Sub menu appears.

11.) Select the appropriate video signal by pressing the ↑ (up) or ↓ (down) button respectively.
To check the video signal, see: Table 3-8, "TV-System and Region Code," on page 3-37.

12.) Press the **SET** button **(C)**.
The message *"Now loading..."* appears and the unit starts to save the settings.

13.) When *"Power off"* appears on the display, press the **POWER** switch on the front of the DVD recorder to turn power off.

14.) Press the **POWER** switch again to turn power on.

3-5-6-5-3 Change the Region Code

NOTE: To specify the correct region code, see: Table 3-8, "TV-System and Region Code," on page 3-37.

1.) If not already done, switch on the Sony DVO-1000MD DVD recorder.
2.) Press the **MENU** button **(A)** located on the front of the DVR, see: Figure 3-26 on page 3-34.
3.) The "Main Menu" appears on the LCD screen of the DVD recorder, see: Figure 3-32 below.

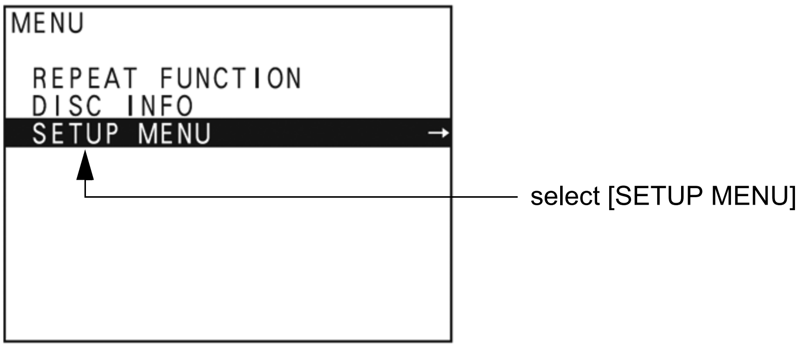


Figure 3-32 "Main Menu" - [SETUP MENU] highlighted

4.) Press the ↓ (down) button on the front of the recorder repeatedly until the [SETUP MENU] item is highlighted.
5.) Press the → (right) button. The "Setup Menu" appears, see Figure 3-31 on page 3-36.
6.) Press the ↓ (down) button repeatedly, until [REGION CODE] is highlighted.
7.) Press the → (right) button. The "Region Code Menu" appears.
8.) Select the appropriate region code by pressing the ↑ (up) or ↓ (down) button respectively.
To check the region code, see: Table 3-8, "TV-System and Region Code," on page 3-37.
9.) Press the **SET** button **(C)**.
The message *"Now loading..."* appears and the unit starts to save the settings.
10.) When *"Power off"* appears on the display, press the **POWER** switch on the front of the DVD recorder to turn power off.
11.) Press the **POWER** switch again to turn power on.

Table 3-8 TV-System and Region Code

Country	Region Code	TV-System
USA and Canada	1	NTSC
Western Europe, Middle East, South Africa	2	PAL
Japan	2	NTSC
Southeast Asia, incl. Hong Kong	3	PAL/NTSC
Central and South America, Australia	4	PAL
Africa	5	NTSC
Eastern Europe, Russia, Central Asia incl. India	5	PAL
China	6	PAL

3-5-7 Connecting the Wireless Network Adapter

BT Version: The Wireless Network USB Adapter is only applicable at systems with BT08 software.

The Wireless Network Adapter can be connected to any accessible USB port of the Voluson® E8.

NOTE: *Connection of the WLAN Adapter is always the same (no differences between PC-Motherboard installed in the system).*

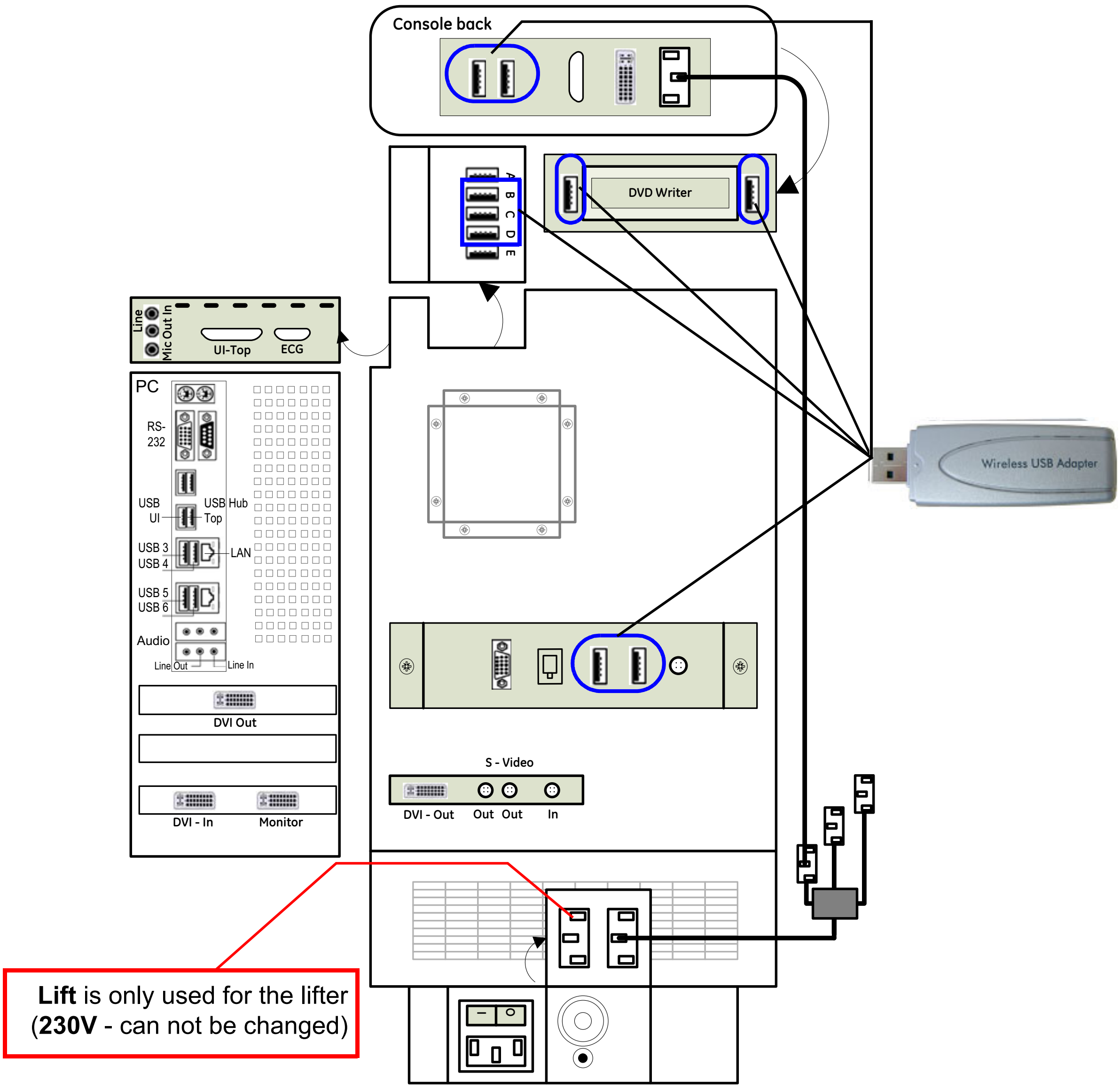


Figure 3-33 Connection Scheme - Wireless (USB) Network Adapter

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® E8.
All software drivers are pre-installed for the designated Wireless Network adapter only.

NOTE: *After physical connection of the WLAN adapter to the Voluson® E8 system, follow the procedure described in Section 3-11-2 "Wireless Network Configuration" on page 3-79.*

3-5-8 Connecting the VGA Image (Video) Resizer

NOTICE The VGA Image (Video) Resizer is required whenever the used Secondary "Patient" Monitor has a different screen resolution than the Voluson® E8 system!

NOTE: *Connection of the VGA Image Resizer is always the same (no differences between PC-Motherboard and/or BT-version of the system).*

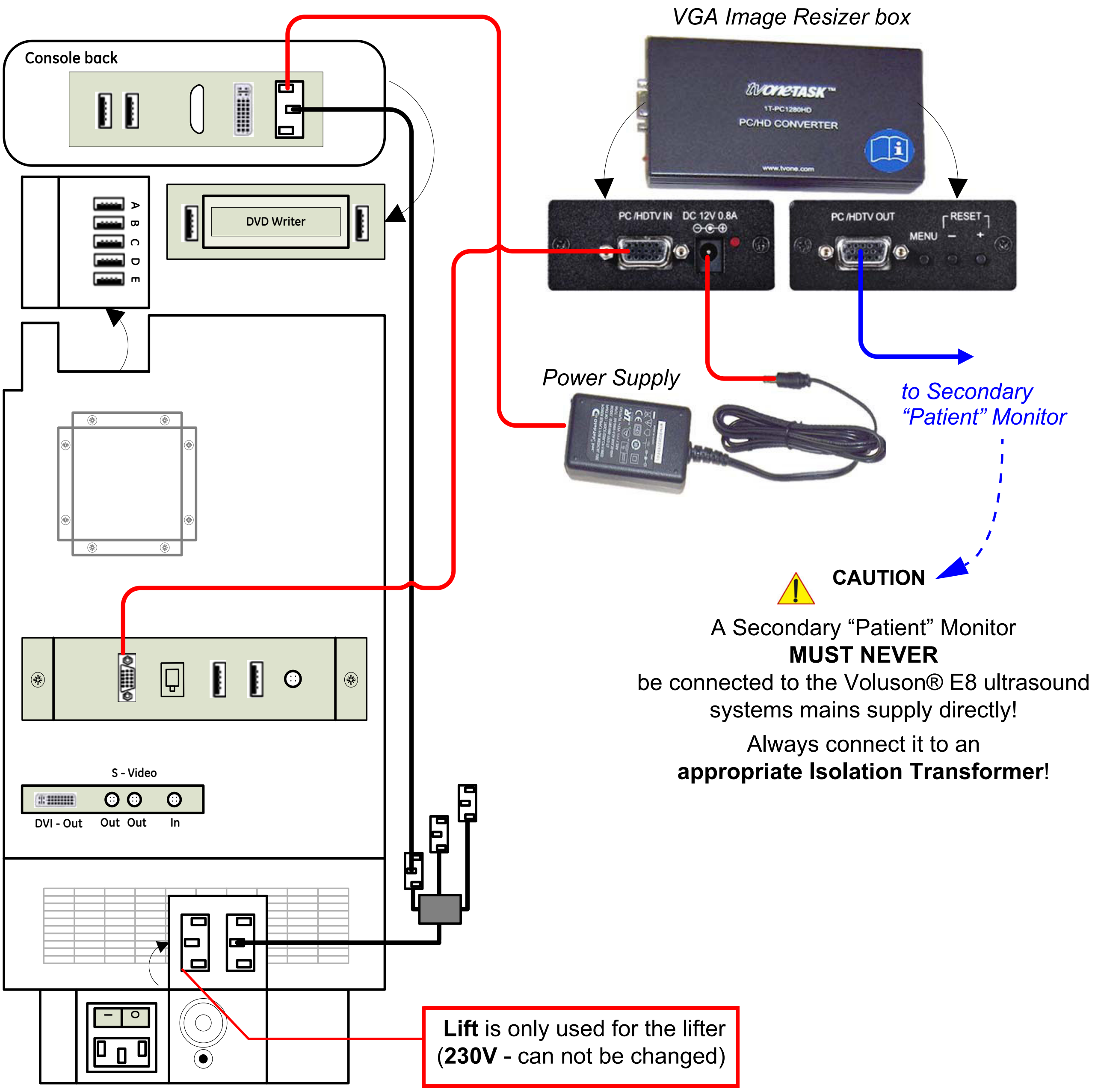


Figure 3-34 Connection Scheme - VGA Image Resizer

NOTE: *After physical connection of the VGA Image Resizer to the Voluson® E8 system, follow the procedure described in* *Section 3-5-8-1 "Adjustment of the VGA Image Resizer Settings" on page 3-40*.

3-5-8-1 Adjustment of the VGA Image Resizer Settings

To get the best results in image quality out of this Resizer Box you should make the following settings.

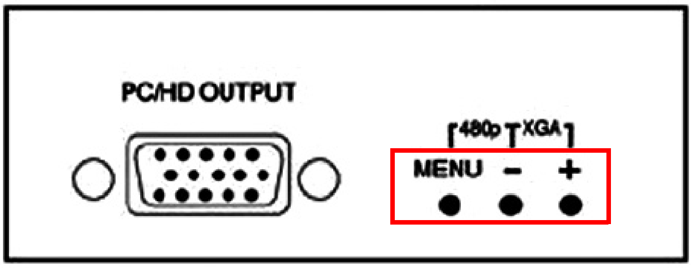


Figure 3-35 keys on Image Resizer

1.) Set the output resolution of the Image Resizer to the native resolution of the monitor:
   a.) Press the **MENU** key at the Image Resizer and use **+** (plus) and **-** (minus) key to navigate to ***Output Setup*** using the On Screen Menu.
   b.) Press the **MENU** key to enter the sub menu output setup, press the **MENU** key again to highlight the ***Mode Setting***.
   c.) Choose mode with **+** and **-** key.
   When correct mode is displayed press **MENU** key to activate the setting.
   d.) Navigate to menu item ***Exit*** and press **MENU** key to leave the On Screen Menu.

NOTICE Changes get effective immediately. If monitor is not showing anything after a change, your setting might be wrong. To reset the Image Resizer in case that anything went wrong, press either the **MENU** and **-** key or the **+** and **-** key until the image reappears. Try other settings that are supported by your monitor.

2.) Use high quality Video cables especially for longer distances. High quality cables improve overall image quality due to lower sensitivity on electromagnetic interferences.
3.) Set Brightness & Contrast for best and detailed image display.
   a.) Press **MENU** key, select ***Picture Adj.*** using the On Screen Menu.
   b.) Select first item ***Cont.*** (means contrast) by pressing the **MENU** key and adjust it (using **+** and **-** key) until you think you get the best result on your monitor and then press the **MENU** key.
   c.) Navigate to ***Bright.*** (means brightness) and press **MENU** key again to highlight item.
   d.) Set brightness to any value you think it results in the best quality image for your monitor and then press the **MENU** key.

*NOTE: You may change the **Color** setting in the same way if you think adjustment is necessary.*

   e.) When everything is done, navigate to ***Exit*** and press **MENU** key to leave the On Screen Menu.

3-5-9 Connecting the 19” LCD Secondary “Patient” Monitor

CAUTION **The 19” LCD Secondary “Patient” Monitor MUST NEVER be connected to the Voluson® E8 ultrasound systems mains supply directly!**
Always connect it to the supplied Isolation Transformer!

The Secondary Monitor is the only item to be connected to the Transformer.

NOTICE Whenever it is desired to connect the 19” LCD Secondary “Patient” Monitor to a Voluson® E8 **BT06** system, the VGA Image Resizer (KTZ280074) is required!

Different screen resolution: Voluson® E8 LCD Monitor => 15”, LCD Secondary Monitor => 19”

NOTICE The 19” LCD Secondary Monitor is **NOT intended for diagnostic use**.
It is an additional device used to allow the patient to watch the proceedings.

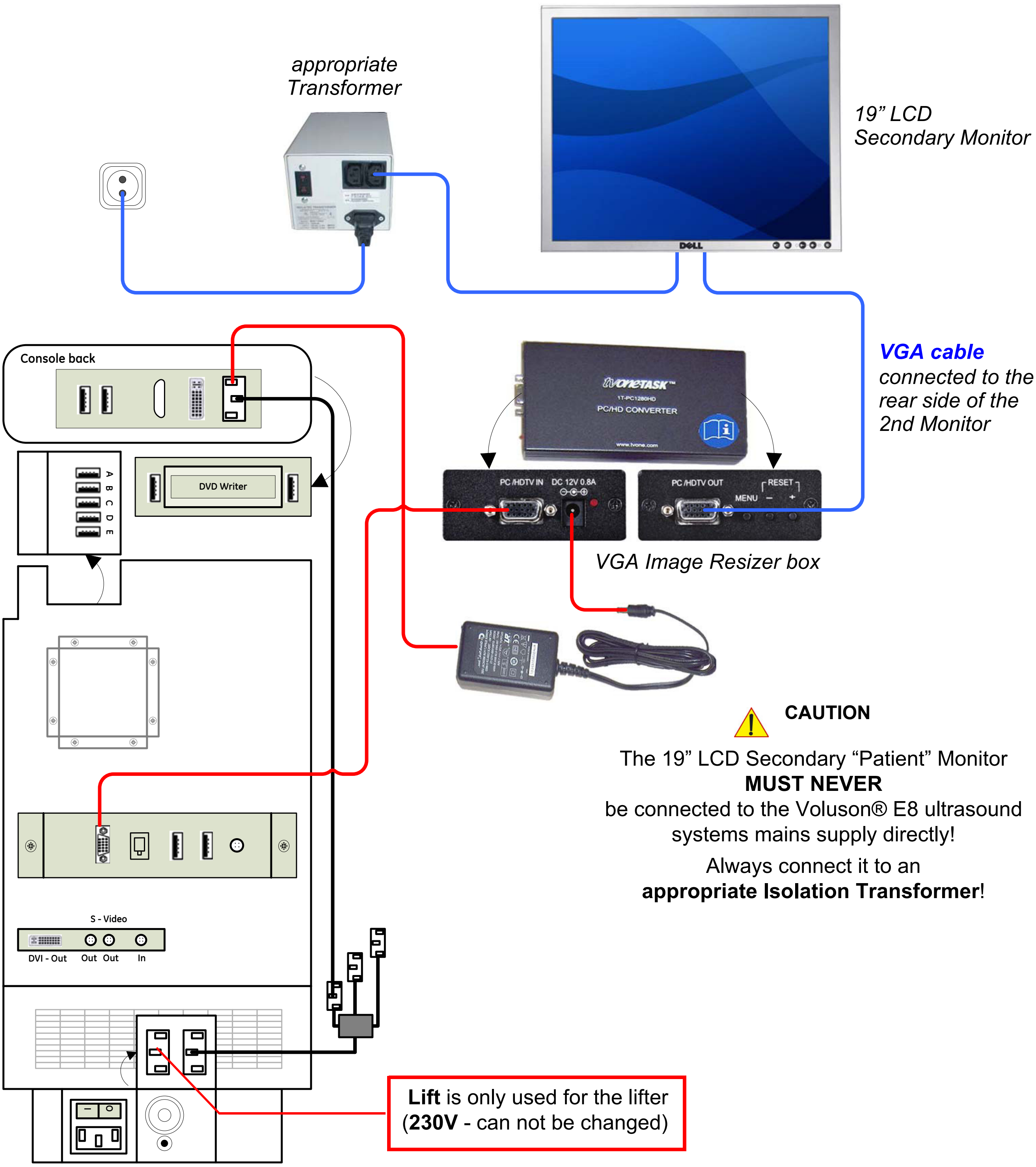
Take your time to think about the best position of the monitor in your facilities.
Patients should be able to view the monitor easily and without having to bend or turn around.

NOTICE **DO NOT** connect the 19” LCD Secondary Monitor to the Voluson® E8 via USB cable.
Use the supplied VGA cable.

1.) Power OFF/Shutdown the system as described in: Section 3-6-3 on page 3-50.
2.) Connect the Secondary Monitor according to connection scheme (see: Figure 3-36 on page 3-42).

NOTE: Connection of the 19” LCD Secondary “Patient” Monitor is always the same
(no differences between PC-Motherboard and/or BT-version of the system).

3-5-9 Connecting the 19” LCD Secondary “Patient” Monitor (cont’d)



CAUTION

The 19” LCD Secondary “Patient” Monitor
MUST NEVER
be connected to the Voluson® E8 ultrasound systems mains supply directly!

Always connect it to an
appropriate Isolation Transformer!

Figure 3-36 Connection Scheme - 19” Secondary LCD Monitor

3-5-10 Connecting the Footswitch

The footswitch should be directly connected to any accessible USB-port on the Voluson® E8 (e.g., on rear of the system).

NOTE: Connection of the Footswitch is always the same (no differences between PC-Motherboard and/or BT-version of the system).

After physical connection, adjust the Footswitch (Left/Right) as described in Section 3-8-1-8 "How to adjust function of the Footswitch (Left/Right)" on page 3-69.

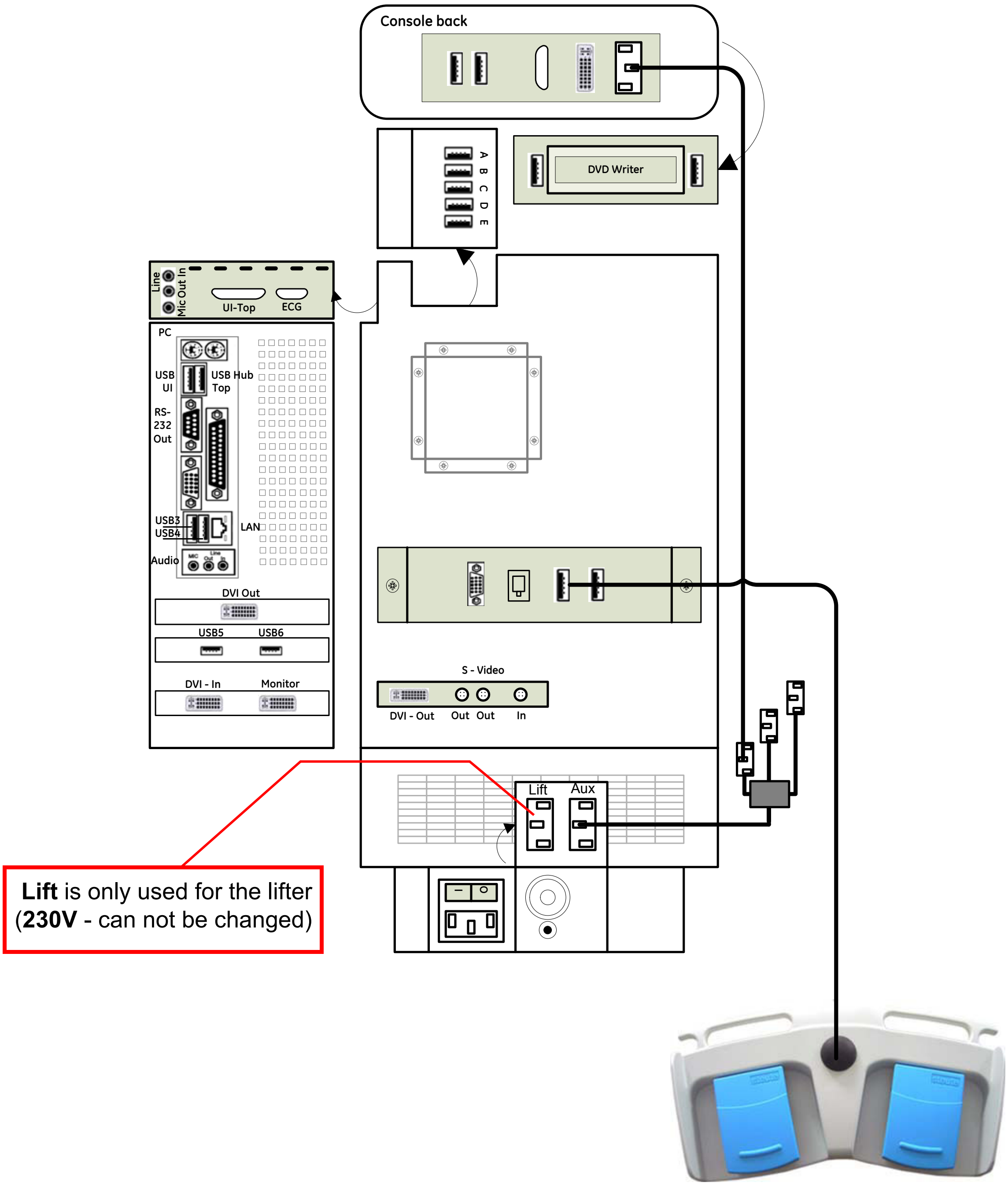


Figure 3-37 Connection Scheme - Footswitch

3-5-11 Connecting the ECG-preamplifier

NOTE: *Connection of the ECG is always the same*
(no differences between PC-Motherboard and/or BT-version of the system).

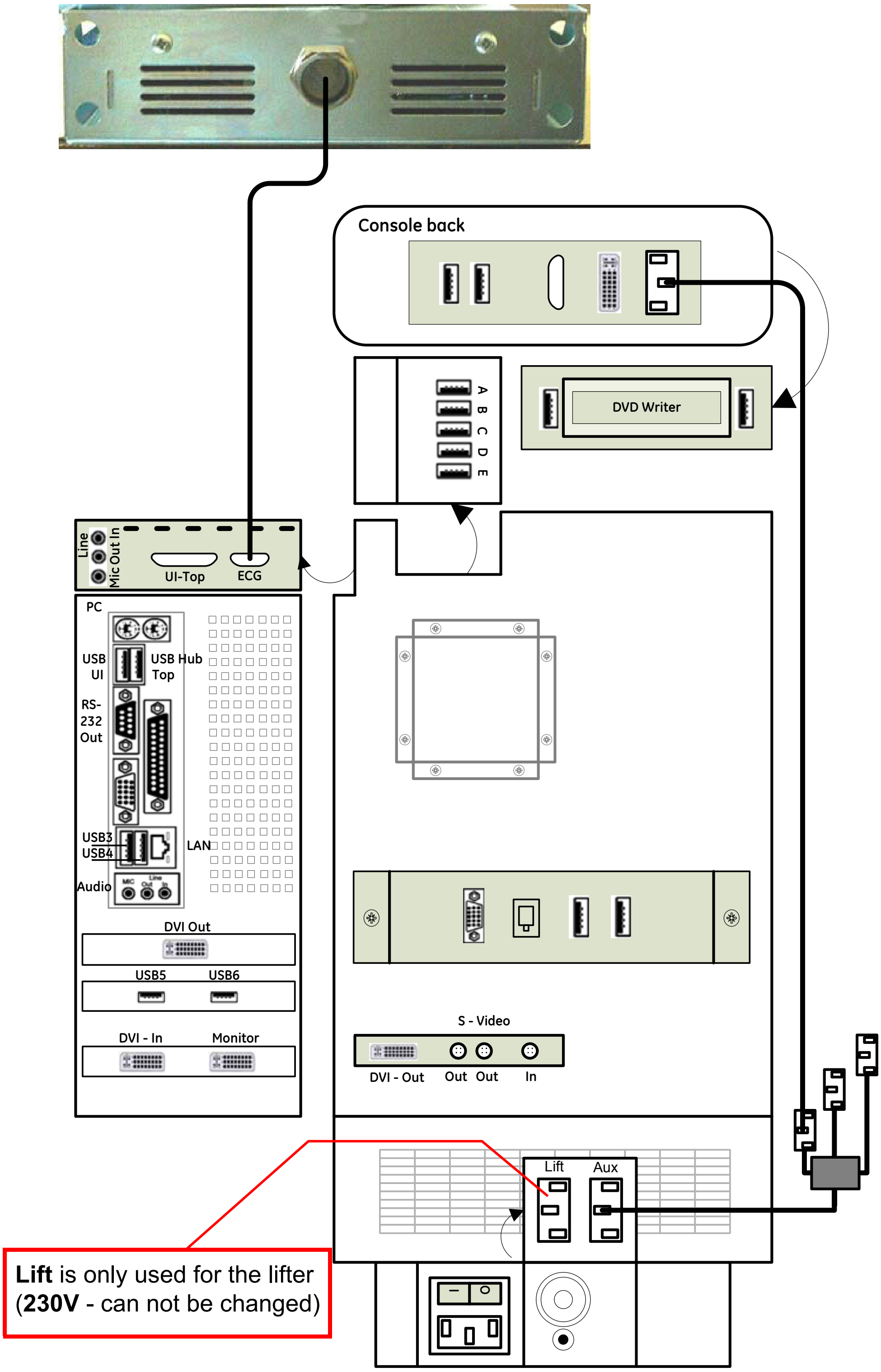


Figure 3-38 Connection Scheme - ECG-preamplifier

3-5-12 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 3-46.

The USB Flash Memory Stick may be connected to an accessible USB port of the Voluson® E8 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® E8, 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 **USB** button on the keyboard.
For further details refer to: Section 3-5-14-2 "External USB-Devices - Disconnection" on page 3-46.

3-5-13 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 3-46.

The external "Handydrive" HDD may be connected to an accessible USB port of the Voluson® E8 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® E8, 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 **USB** button on the keyboard.
For further details refer to: Section 3-5-14-2 "External USB-Devices - Disconnection" on page 3-46.

3-5-14 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!***

3-5-14-1 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® E8, 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® E8 Basic User Manual.

3-5-14-2 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! For this purpose press the **USB** button on the keyboard.

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 **USB** key on the keyboard, a dialog window (see: Figure 3-39 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.

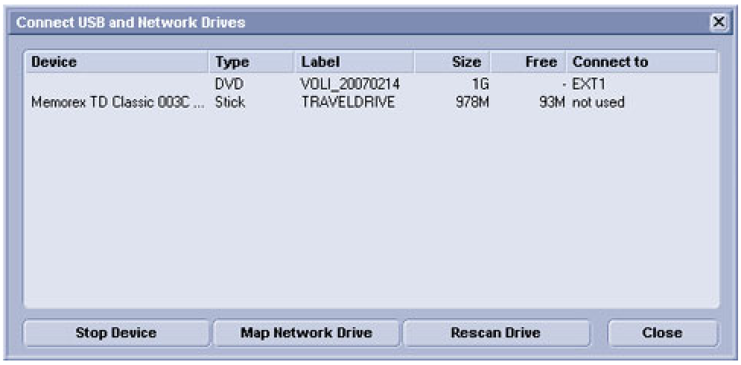


Figure 3-39 Connect USB and Network Drives

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

Figure 3-40 Device can now be safely removed

Confirm the ‘Stop Device‘ dialog with OK and CANCEL 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® E8 ultrasound unit to a power source should be performed by a qualified person who has completed basic Voluson® E8 System User Training.
Use only the power cords, cables and plugs provided by or designated by GE Healthcare - Kretztechnik to connect the unit to the power source.

CAUTION **Prior to connect the Voluson® E8 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® E8 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® E8 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® E8 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.) 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.

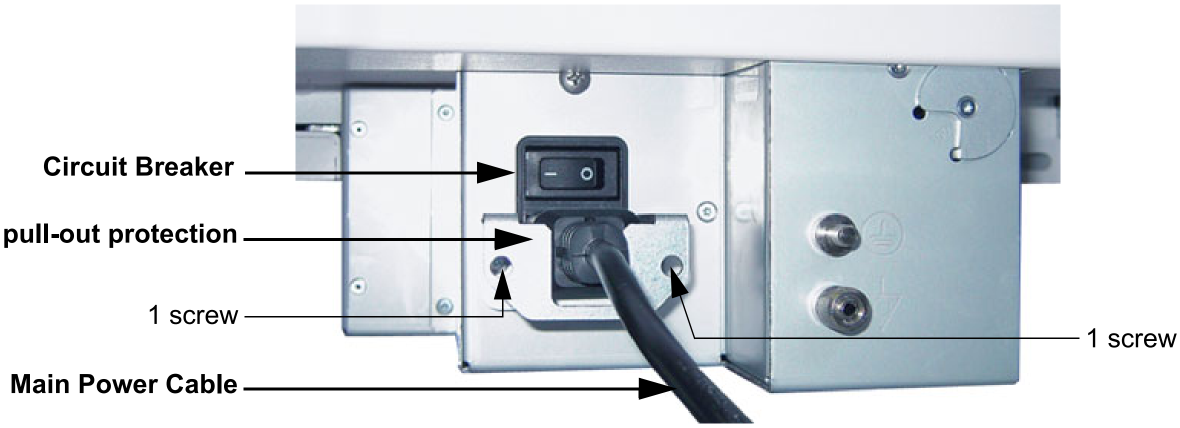


Figure 3-41 Circuit Breaker, pull-out protection and main power cable at rear of system

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.

5.) Hold down the **On/Off** button (see: Figure 3-42) 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

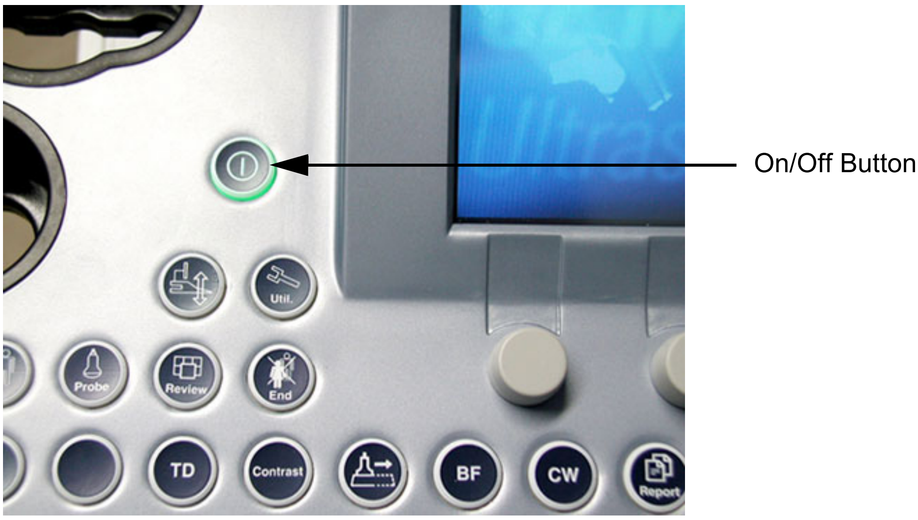


Figure 3-42 On/Off Button on Control Panel

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.

6.) Adjust Height and position of control console.
Refer to Section 6-5 "Control Console Positioning" on page 6-8.

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 3-43 below).

Figure 3-43 Boot screen

3.) Back-End Processor is turned ON and starts to load the software.
4.) The Start Screen (Voluson E8) is displayed on the monitor.
5.) Start-up progress bars indicating software loading procedures, are displayed on the monitor, as shown in Figure 3-44 below.

Figure 3-44 GE Healthcare wallpaper with progress bar

6.) The software initiates and sets up the Front-End electronics and the rest of the scanner (incl. the clicking sound of the relays on the RTF board).
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 3-42) on the control panel. Following dialog appears.

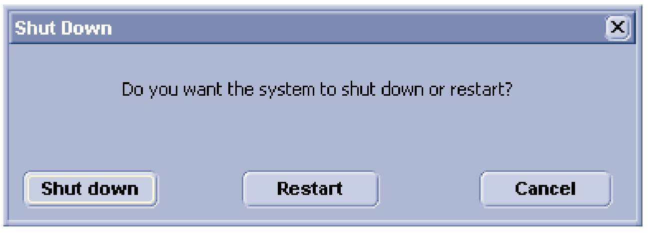


Figure 3-45 Shutdown, Restart or Cancel

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.

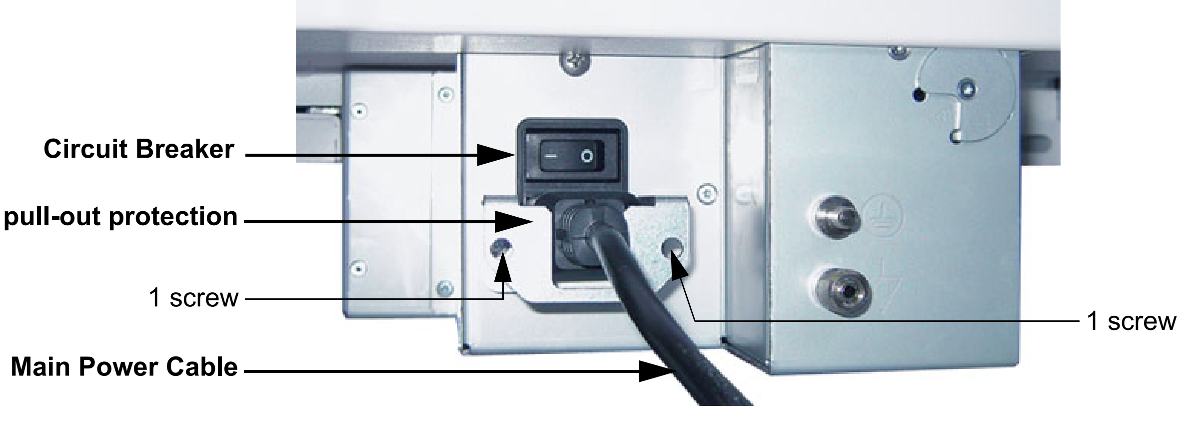


Figure 3-46 Circuit Breaker, pull-out protection and main power cable at rear of system

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

7.) Disconnect probes. (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 horizontal position.
3.) Insert the connector on the receptacle guide pin until it touches the receptacle mating surface.
4.) Twist the probe locking lever clockwise (to vertical position) to lock it in place.

Transducer **unlocked** (locking lever in horizontal position)

Transducer **locked** (locking lever in vertical position)

Figure 3-47 Transducer Connection

5.) Open the side door, lay the cable into the intended cable holder and close the door.
6.) 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 3-9.*

For further installation instructions see:

- Section 3-7-1 "Installing Digital Black & White Printer Sony UP-D897" on page 3-53
- Section 3-7-2 "Installing Digital Color Printer Sony UP-D23MD" on page 3-55
- Section 3-7-3 "Printer Installation manually" on page 3-57
- Section 3-7-4 "Adjustment of Printer Settings" on page 3-61

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 3-50.

2.) Connect the printer as described on page 3-11.

NOTICE Do not connect the USB-cable to the printer!

NOTE: "Mouse functions" can be performed by using the trackball for moving the cursor.
"Normal select" (Click) = left/right trackball key ; "Opening a context menu" = upper trackball key

3.) Turn ON the printer, then switch ON the power of the system and wait till the system has booted.

NOTE: The power switch of the printer has to be in ON position before starting the system!

3-7-1-1 Install the UP-D897 printer software/driver

Perform the following steps if this printer was never installed on the Voluson® E8!

1.) Connect the USB cable to the printer and the system. The windows 'Searching for Drivers …', 'Found new Hardware …' and finally the following windows appear.

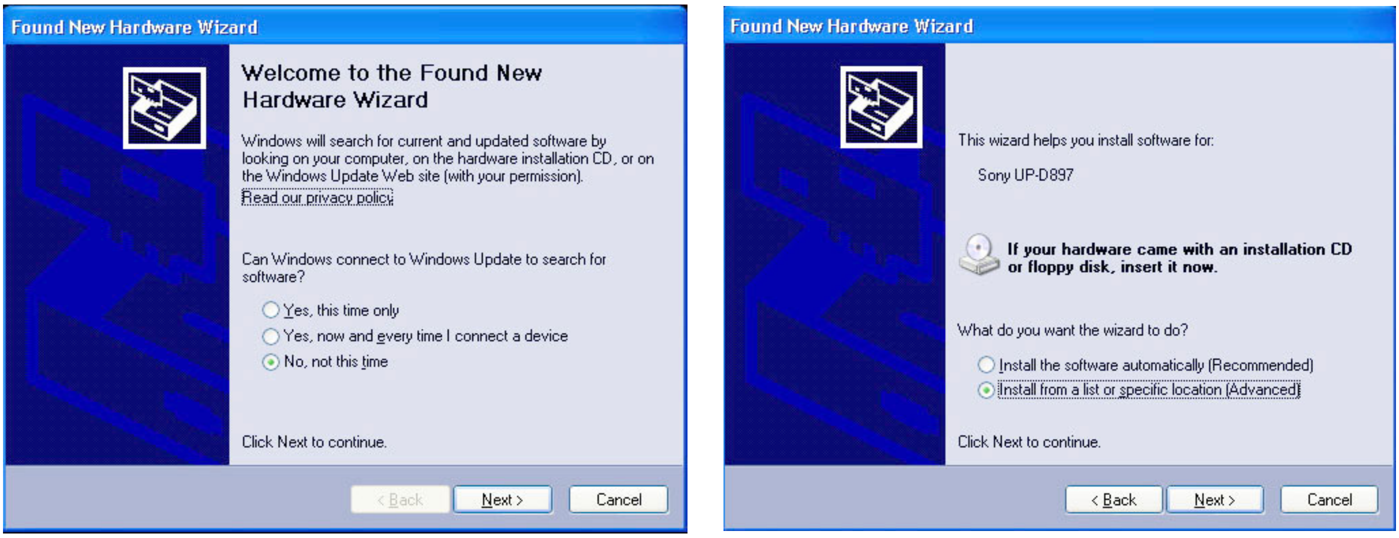


Figure 3-48 Found New Hardware Wizard

2.) Select "No, not this time" and verify with NEXT.

3.) In the next window, select "Install from a list or specific location!" and then click on NEXT.

4.) Select "Search for the best driver in these locations" and check mark "Include this location in the search" (see: Figure 3-49 on page 3-54).

3-7-1-1 Install the UP-D897 printer software/driver (cont'd)

NOTE: If path (R:\system\....) is different from what is shown in Figure 3-49, click on the BROWSE button to search correct driver.

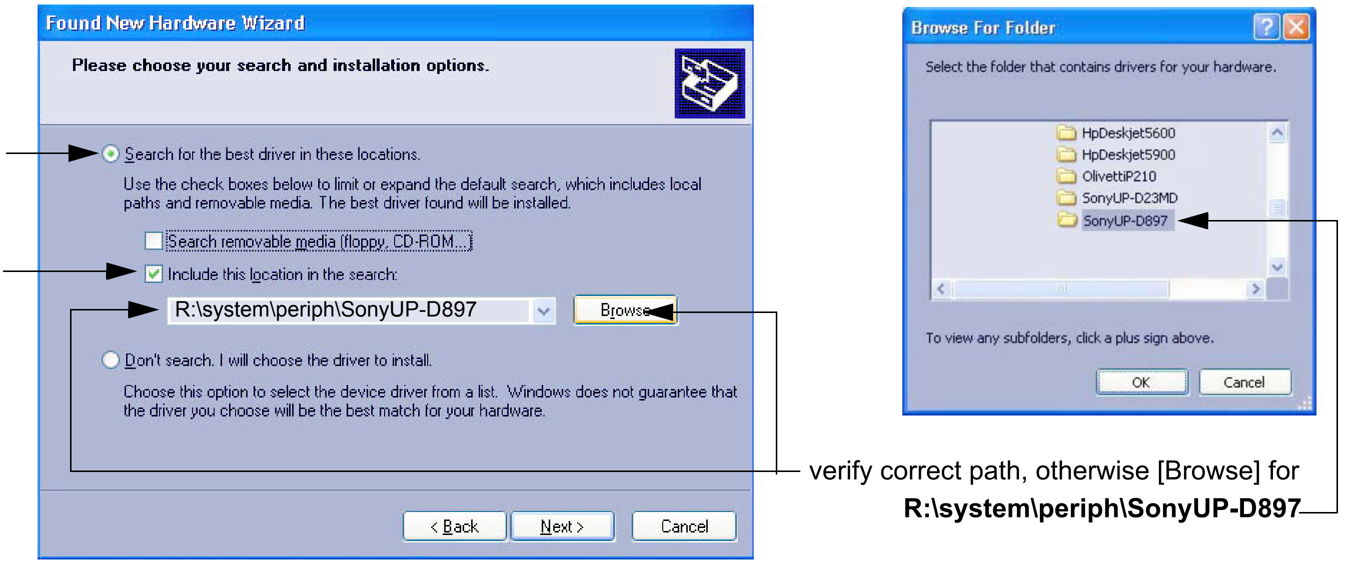


Figure 3-49 Search for Network path

5.) Confirm the correct path and click NEXT to install the driver. All necessary files are copied.
6.) If the following Warning message appears, click CONTINUE ANYWAY.

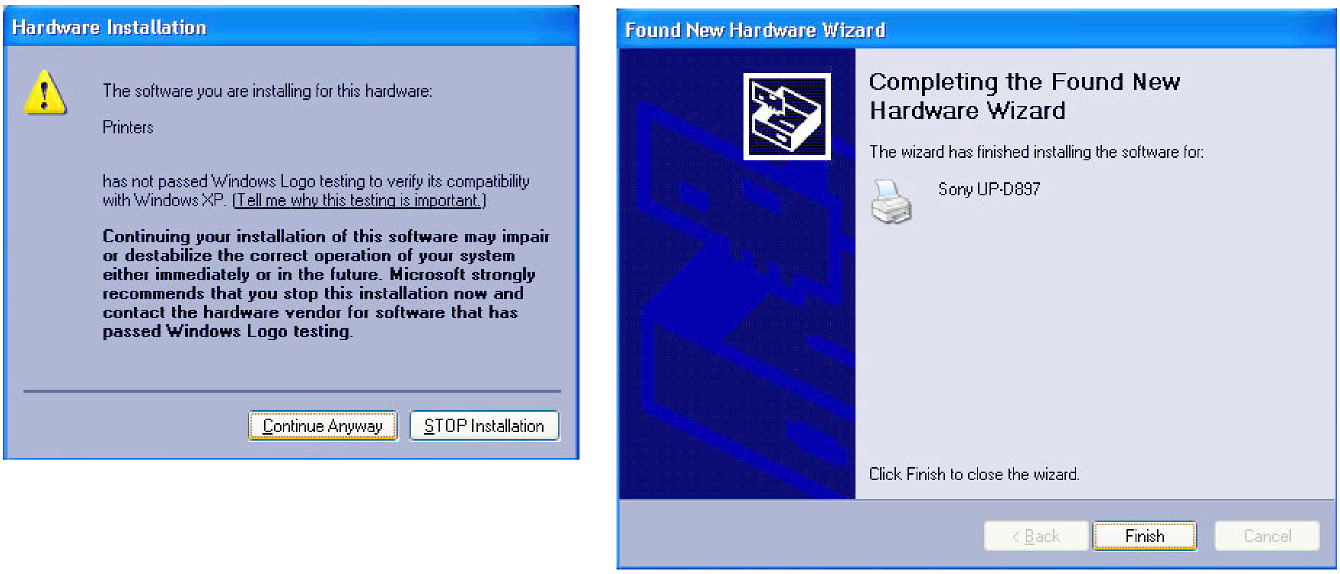


Figure 3-50 Finish installation

7.) Confirm the installation by clicking FINISH to close the Hardware Wizard.
8.) Close all open windows 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 3-7-4 "Adjustment of Printer Settings" on page 3-61.

3-7-2 Installing Digital Color Printer Sony UP-D23MD

1.) Power off/Shutdown the system as described in: Section 3-6-3 on page 3-50.

2.) Connect the printer as described on page 3-16.

NOTICE Do not connect the USB-cable to the printer!

NOTE: *"Mouse functions" can be performed by using the trackball for moving the cursor.*
"Normal select" (Click) = left/right trackball key ; "Opening a context menu" = upper trackball key

3.) Turn ON the printer, then switch ON the power of the system and wait till the system has booted.

NOTE: *The power switch of the printer has to be in ON position before starting the system!*

3-7-2-1 Install the UP-D23MD printer software/driver

Perform the following steps if this printer was never installed on the Voluson® E8!

1.) Connect the USB cable to the printer and the system. The windows 'Searching for Drivers …', 'Found new Hardware …' and finally the following windows appear.

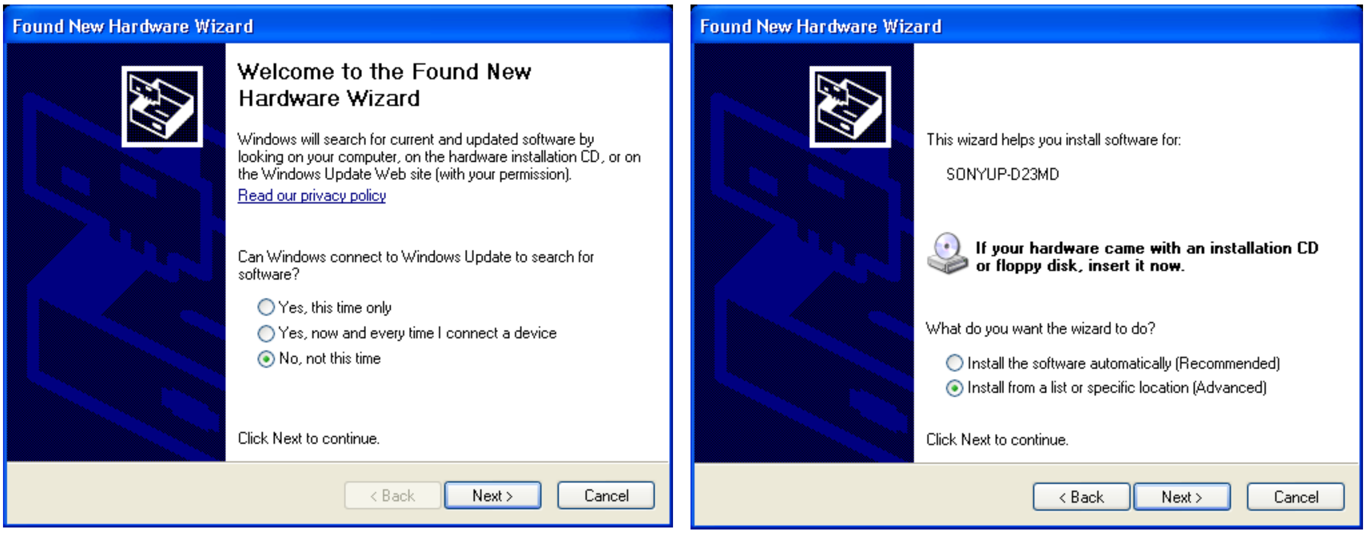


Figure 3-51 Found New Hardware Wizard

2.) Select "No, not this time" and verify with NEXT.

3.) In the next window, select "Install from a list or specific location!" and then click on NEXT.

4.) Select "Search for the best driver in these locations" and check mark "Include this location in the search" (see: Figure 3-52 on page 3-56).

3-7-2-1 Install the UP-D23MD printer software/driver (cont'd)

NOTE: *If path (R:\system\....) is different from what is shown in Figure 3-49, click on the BROWSE button to search correct driver.*

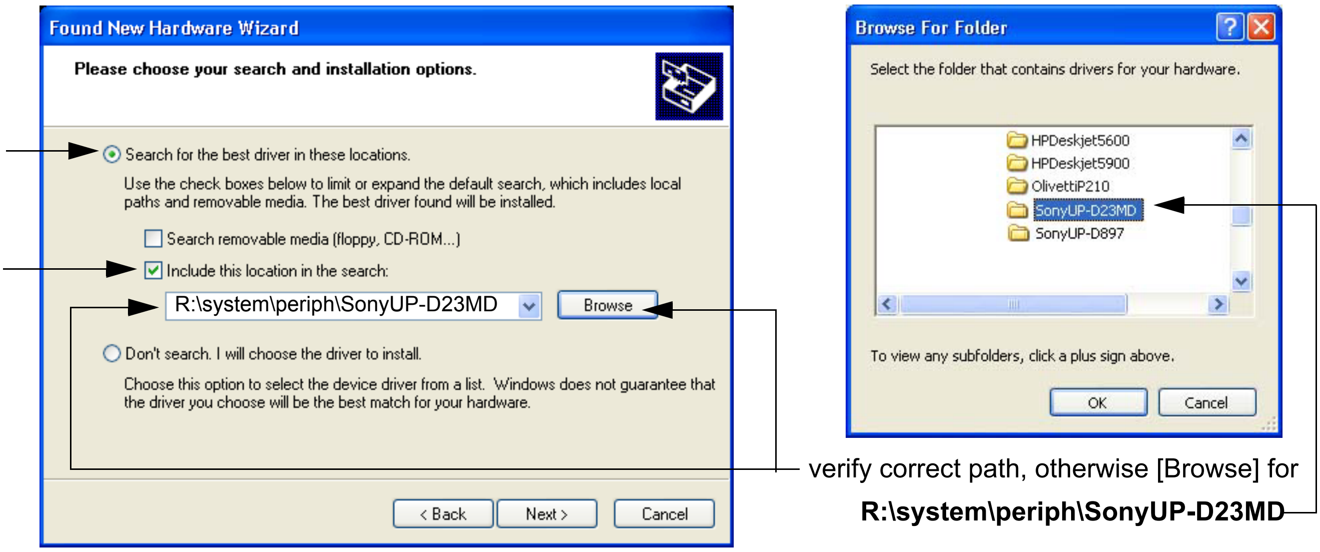


Figure 3-52 Search for Network path

5.) Confirm the correct path and click NEXT to install the driver. All necessary files are copied.
6.) If the following Warning message appears, click CONTINUE ANYWAY.

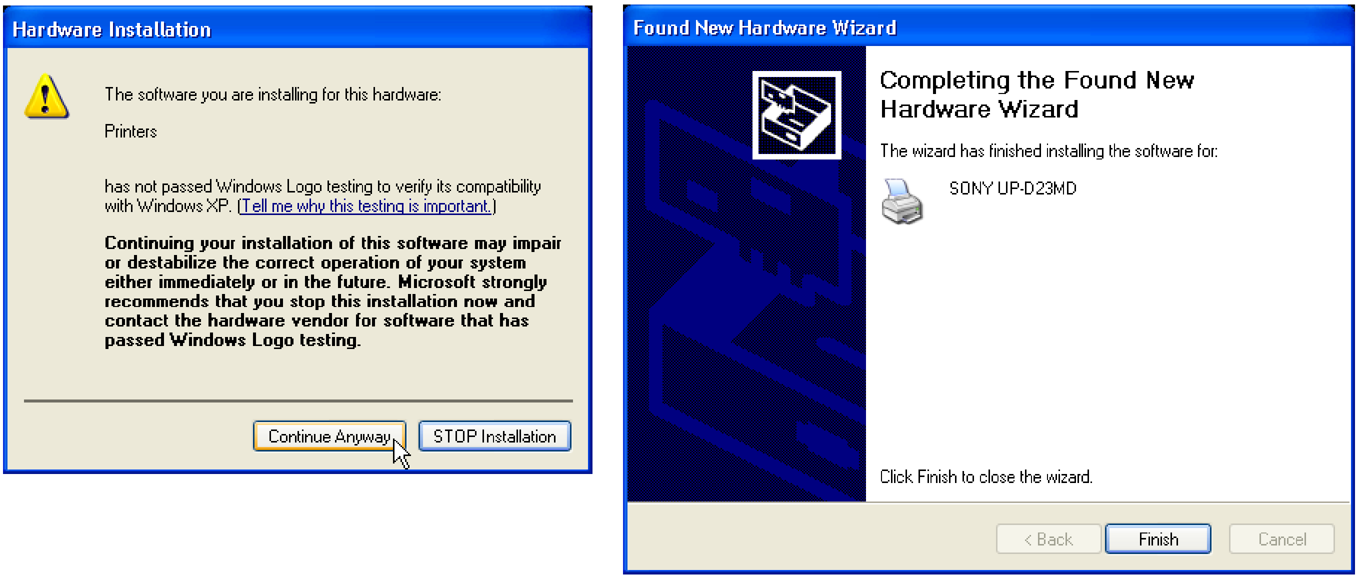


Figure 3-53 Finish installation

7.) Confirm the installation by clicking FINISH to close the Hardware Wizard.
8.) Close all open windows 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 3-7-4 "Adjustment of Printer Settings" on page 3-61.

3-7-3 Printer Installation manually

1.) Press the UTILITIES key on the control panel.
2.) In the “Utilities” menu touch 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.

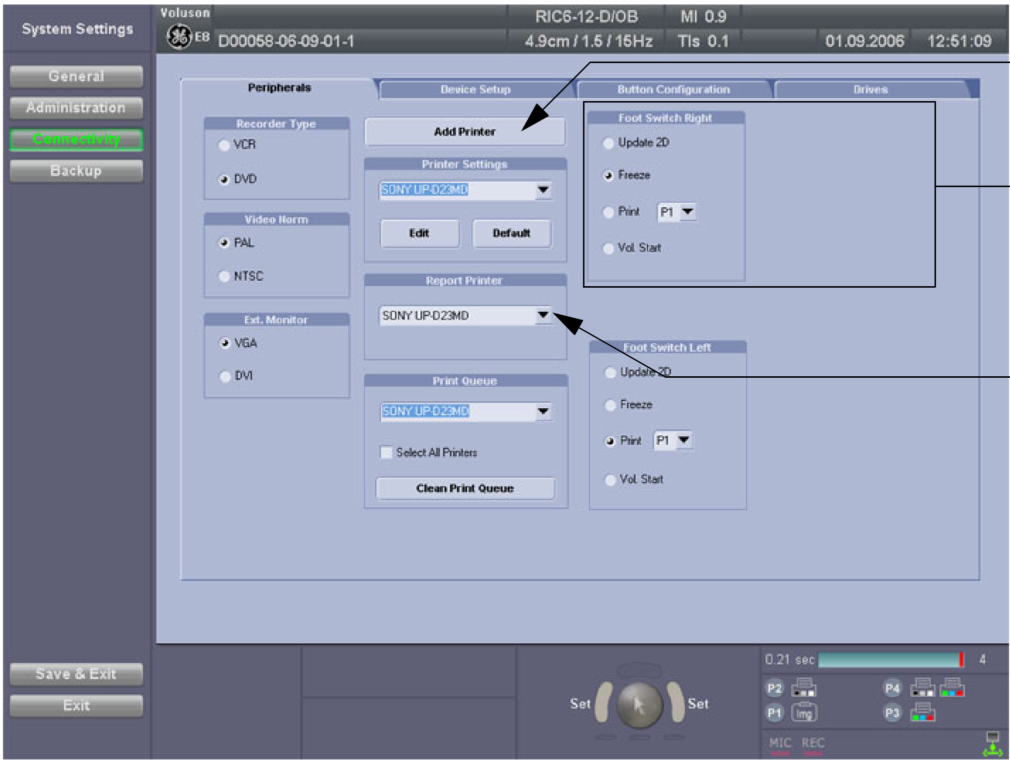
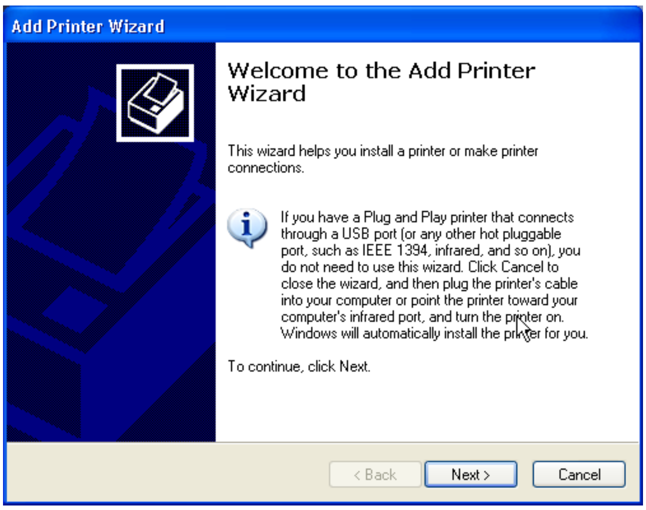


Figure 3-54 System Setup - Connectivity - PERIPHERALS page

4.) Click the ADD PRINTER button (see: Figure 3-54 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.



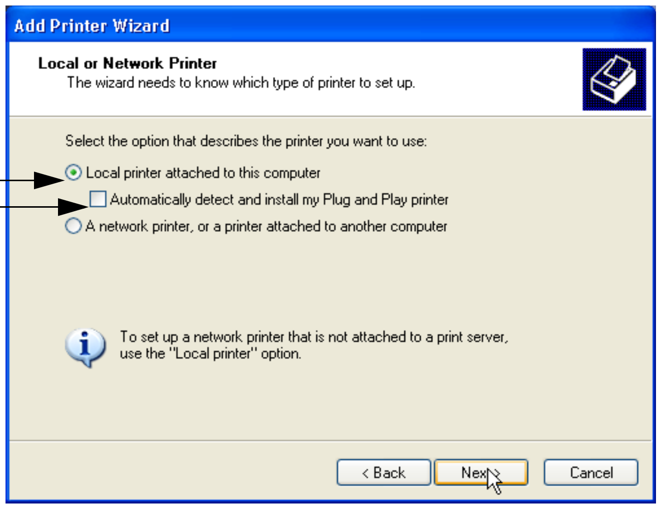


Figure 3-55 Add Printer Wizard

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

7.) Select the corresponding Printer Port (e.g., Figure 3-56 = USB001) and click NEXT.

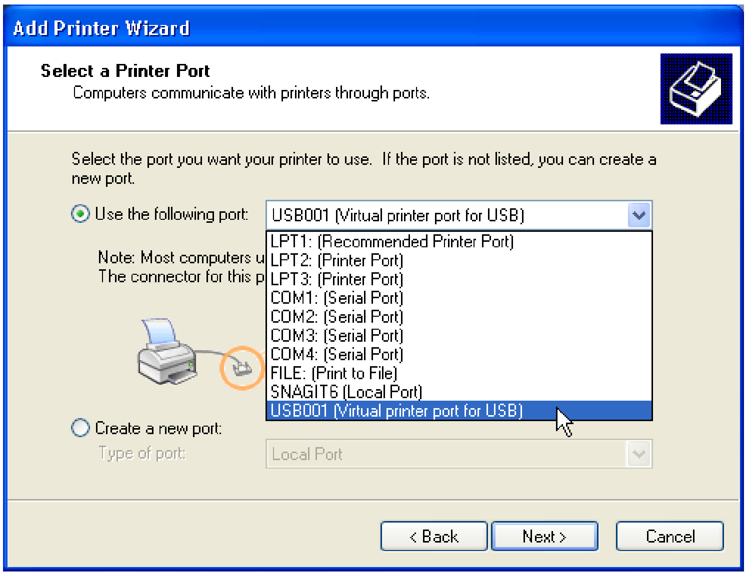


Figure 3-56 Select Printer Port

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

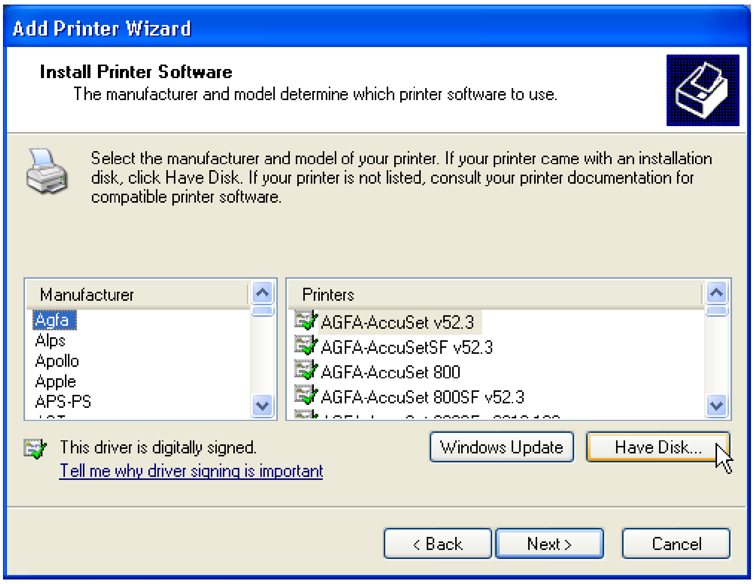


Figure 3-57 Have Disk...

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

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

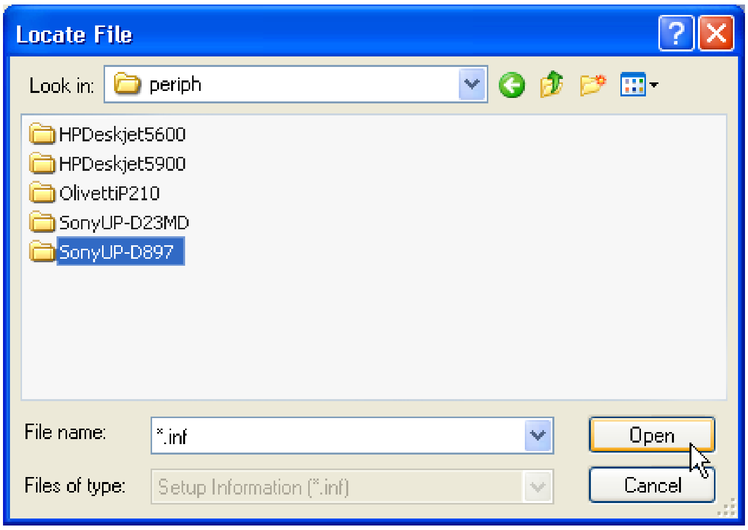


Figure 3-58 Select Printer Driver path (R:\system\periph\....)

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

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

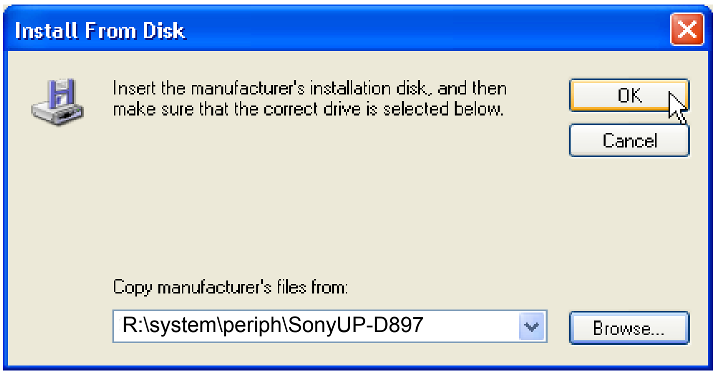


Figure 3-59 verify selected Printer Driver path

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

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

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

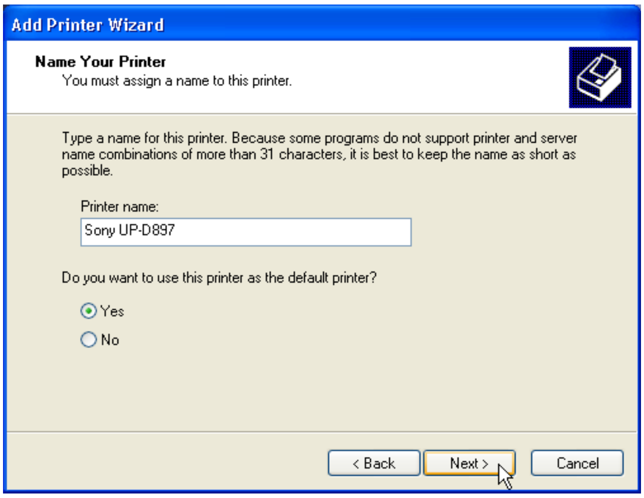


Figure 3-60 Assign name

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.

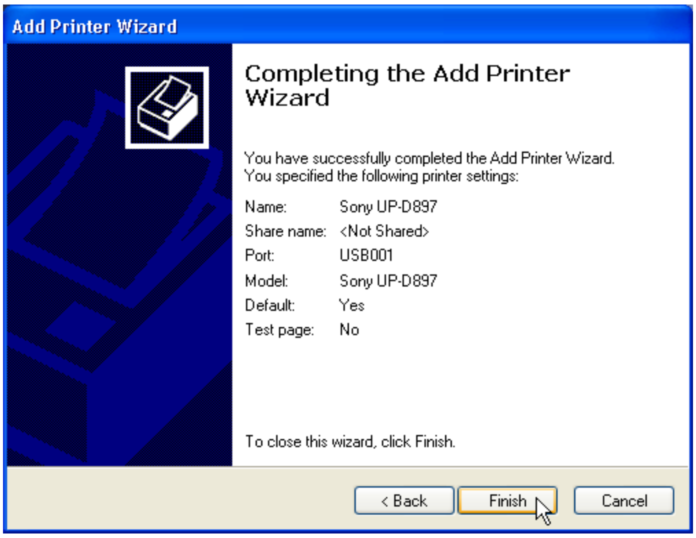


Figure 3-61 Complete manual Printer Installation

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 3-7-4 "Adjustment of Printer Settings" on page 3-61.
Afterwards assign the Printer to the remote keys **P1**, **P2**, **P3** and/or **P4**, see: Section 3-7-5 "Remote Control Selection" on page 3-65.

3-7-4 Adjustment of Printer Settings

1.) After system restart, press the **UTILITIES** key on the control panel.
2.) In the "Utilities" menu touch 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.

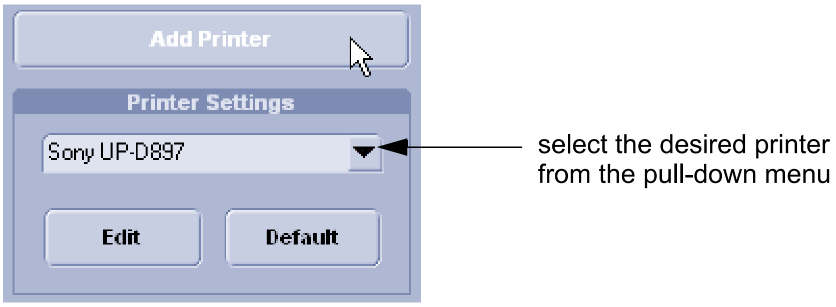


Figure 3-62 Select the desired printer

To adjust the UP-D897 printer see: Section 3-7-4-1 "UP-D897 - Printer Settings" .

To adjust the UP-D23MD Printer see: Section 3-7-4-2 "UP-D23MD - Printer Settings" .

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

3-7-4-1 UP-D897 - Printer Settings

1.) Call up the **'Printer Preferences'**; operation see: Section 3-7-4 "Adjustment of Printer Settings" .

2.) Select the LAYOUT page (see: Figure 3-63 below) and select:

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

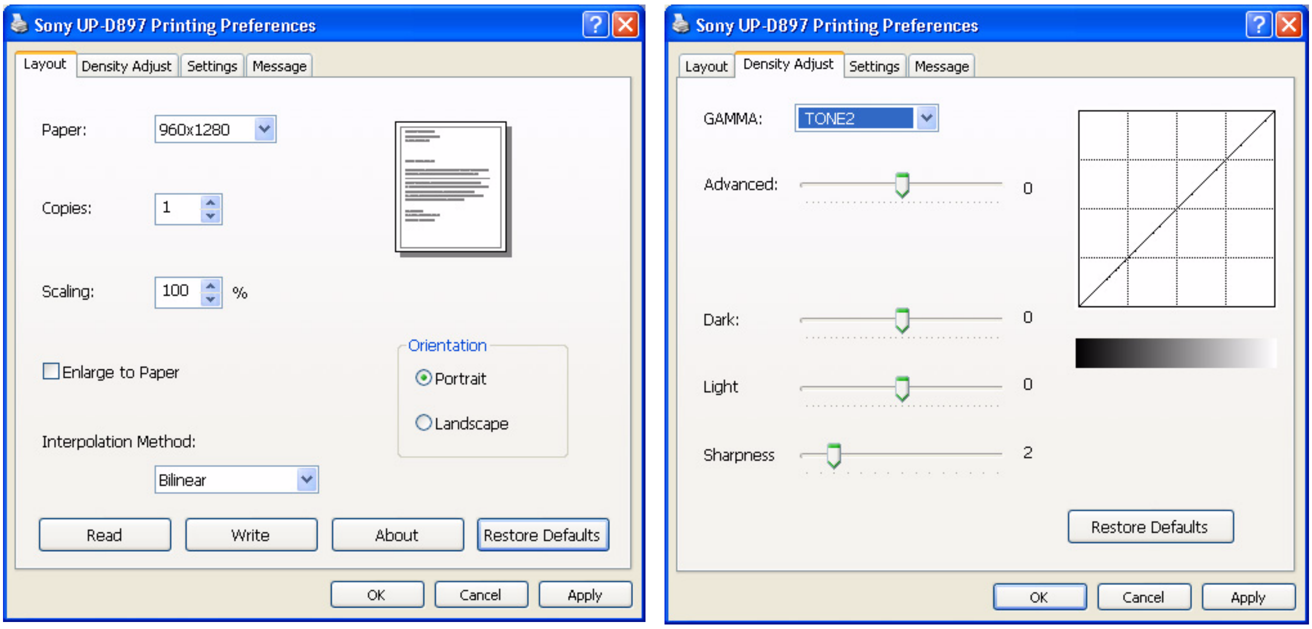


Figure 3-63 Layout + Density Adjust page

3.) Select the DENSITY ADJUST page (see: Figure 3-63 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**;
see: Section 3-7-5 "Remote Control Selection" on page 3-65.

3-7-4-2 UP-D23MD - Printer Settings

1.) Call up the **'Printer Preferences'**; operation see: Section 3-7-4 "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-23L** (large) / UPC-23S (small)
- Orientation: **Landscape** (recommended when using large paper size)
- **High Speed** (check mark on)

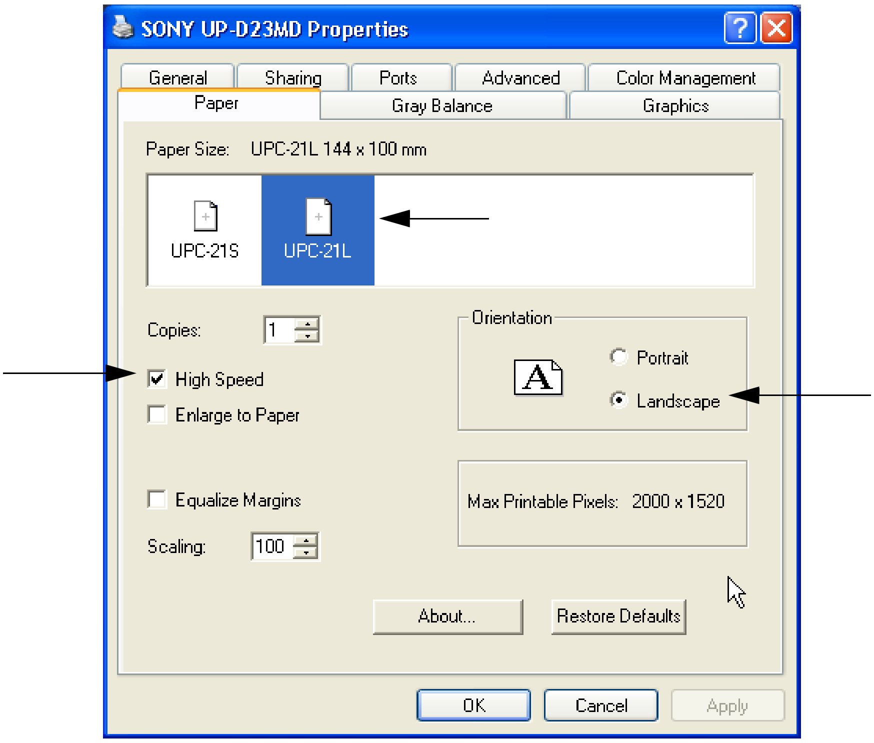


Figure 3-64 Paper page

3-7-4-2 UP-D23MD - 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.) Gamma Select: **Gamma 1**

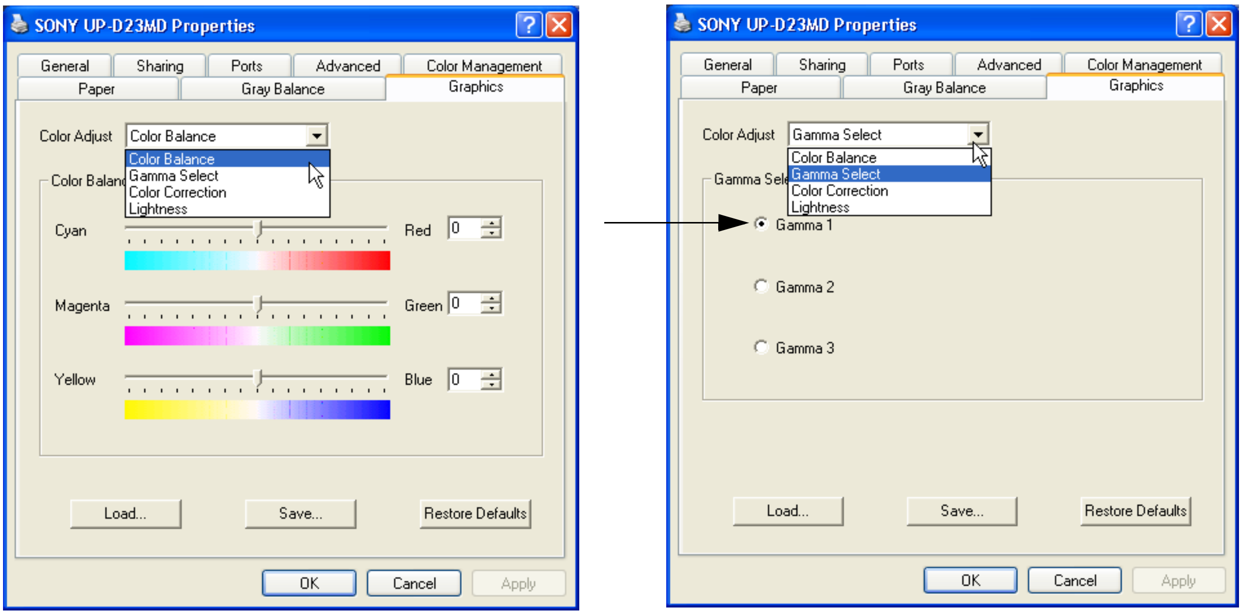


Figure 3-65 Graphics page (Color Balance + Gamma Select)

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

d.) Lightness: Sharpness = **7** or **8**; Dark = **0**; Gamma = **-12**; Light = **8**

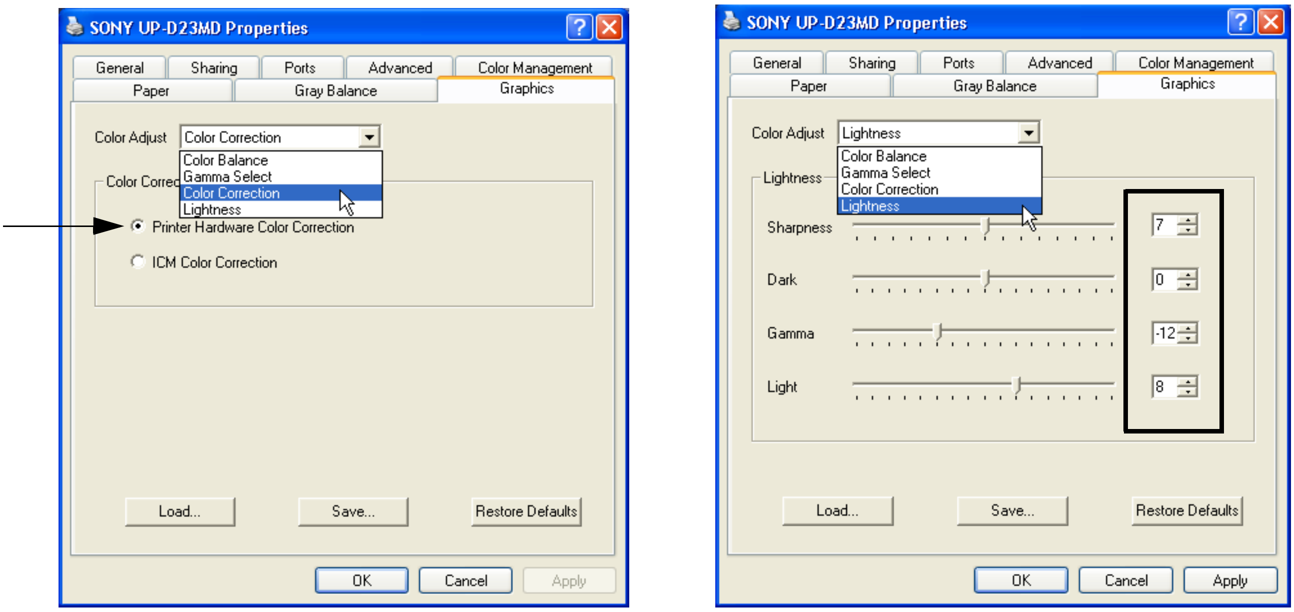


Figure 3-66 Graphics page (Color Correction + Lightness)

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**; see: Section 3-7-5 on page 3-65.

3-7-5 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 touch 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.

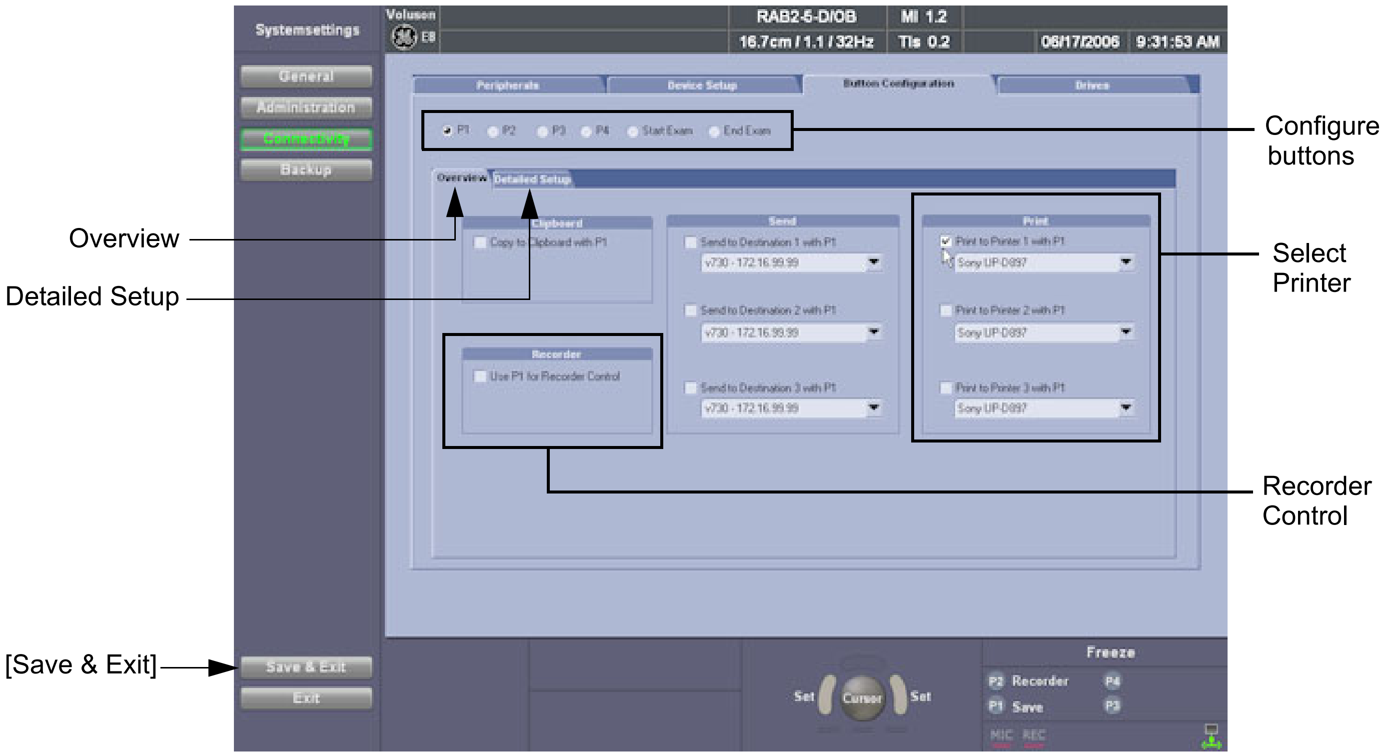


Figure 3-67 System Setup - Connectivity - BUTTON CONFIGURATION page (Overview)

- **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 3-54: System Setup - Connectivity - PERIPHERALS page on page 3-57)

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

3-7-5-1 Report Printer Selection

1.) Click on the **PERIPHERALS** tab.
(refer to: *Figure 3-54: System Setup - Connectivity - PERIPHERALS page on page 3-57*)
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:** enter the password 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 8-13

- **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**, ... (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 Voluson® E8 Basic User Manual; see: Table 9-21, "System Manuals - Voluson® E8 / Voluson® E8 Expert," on page 9-35.

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

1.) Press the **UTILITIES** key on the control panel.
2.) In the "Utilities" menu touch 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 3-66.
2.) On the left side of the screen select GENERAL and then click on the **GENERAL** tab.

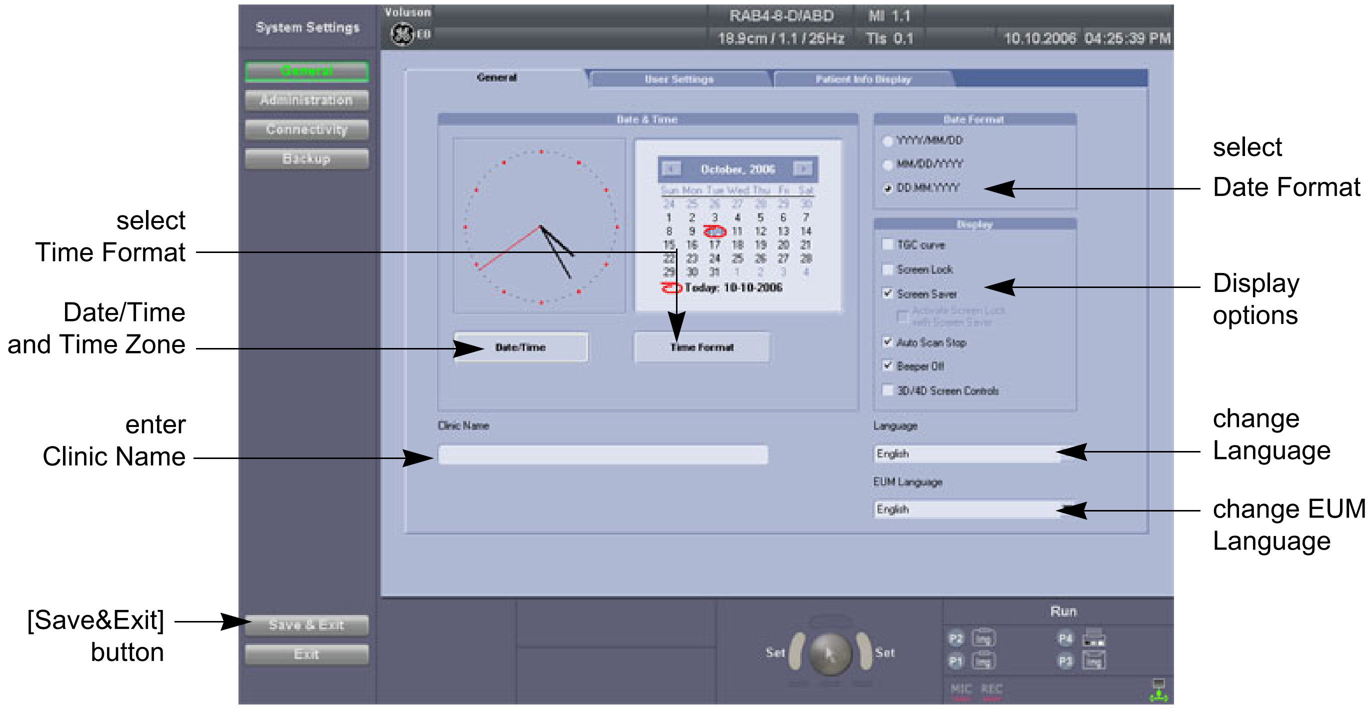


Figure 3-68 System Setup - General - GENERAL page

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.

3-8-1-2-1 How to disable the automatic Daylight Saving Time

see: Chapter 7 - Daylight Saving Time (DST) - New Dates, on page 7-28

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

1.) Invoke System Setup as described in Section 3-8-1-1 on page 3-66.
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 3-66.
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 3-66.
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 3-69 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 change Video Norm

1.) Invoke System Setup as described in Section 3-8-1-1 on page 3-66.
2.) On the left side of the screen select CONNECTIVITY and then click on the **PERIPHERALS** tab.

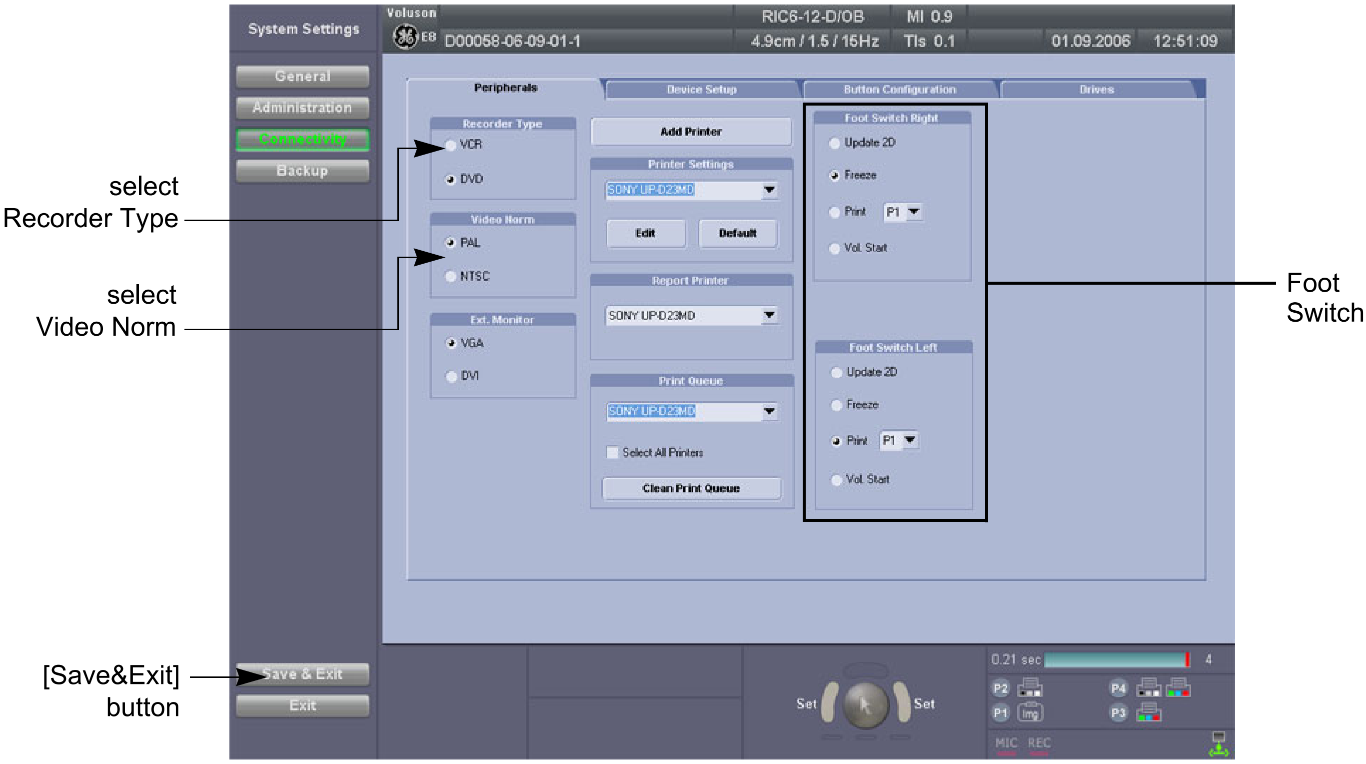


Figure 3-70 System Setup - Connectivity - PERIPHERALS page

3.) If not currently selected, click the desired field PAL (50Hz) or NTSC (60Hz).
4.) Click SAVE&EXIT to save Settings and exit System Setup.
5.) The system will reboot.

3-8-1-7 How to change Recorder Type

1.) Invoke System Setup as described in Section 3-8-1-1 on page 3-66.
2.) On the left side of the screen select CONNECTIVITY and then click on the **PERIPHERALS** tab.
3.) Depending on the used Recorder type, click the desired field VCR or DVD.
4.) Click SAVE&EXIT to save Settings and exit System Setup.

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

1.) Invoke System Setup as described in Section 3-8-1-1 on page 3-66.
2.) On the left side of the screen select CONNECTIVITY and then click on the **PERIPHERALS** tab.
3.) Select desired function of the Footswitch Left and Right.
4.) Click SAVE&EXIT to save Settings and exit System Setup.

3-8-1-9 How to change the Keyboard Layout

see: Chapter 6 - Modification of Keyboard Layout, on page 6-10.

3-8-1-10 How to configure Service Platform

see: Chapter 7 - To configure Service Platform, on page 7-9.

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 Voluson® E8 Basic User Manual; see: Table 9-21, "System Manuals - Voluson® E8 / Voluson® E8 Expert," on page 9-35.

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

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

2.) In the "Utilities" menu touch 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 outlets: Mains socket AUX for accessories.
All mains outlets are co-switched by the unit's mains switch via built-in isolation transformer.
Output voltage for AUX: 115V or 230V.

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 345VA!

Table 3-9 Approved Peripherals

Device	Manufacturer	Model	Connection	Table Number
Digital B/W Video Printer	SONY	UP-D897	USB-Port	Table 9-18
Digital Color Printer	SONY	UP-D23MD	USB-Port	Table 9-18
Color Deskjet Printer (Bluetooth))	Hewlett Packard	HP 5940	USB-Port (Bluetooth)	Table 9-18
	Canon	Pixma MP600 / MP610	USB-Port (Bluetooth)	Table 9-18
Video Cassette Recorder	Mitsubishi	HS-MD3000U (NTSC) HS-MD3000E (PAL)	NTSC PAL	Table 9-17
DVD Recorder	SONY	DVO-1000MD (PAL/NTSC)	PAL / NTSC	Table 9-17
ECG Preamplifier		MAN6		Table 9-19
Footswitch	Steute	GP26	USB-Port	Table 9-19
USB Flash Memory device	SanDisk	Cruzer Micro 512MB	USB-Port	Table 9-19
USB external Hard Disk Drive	Fujitsu	"Handydrive"	USB-Port	Table 9-19
Wireless Adapter (WLAN)	D-Link	AirPlus G DWL-G122	USB-Port	Table 9-19
Wireless Adapter (WLAN)	Netgear	WG111v3	USB-Port	Table 9-19
VGA Image Resizer	TV One	1T-PC1280HD	VGA	Table 9-20
19" Secondary Monitor	DELL	1907FP/1908FP	VGA	Table 9-20
Isolation Transformer	NORATEL	IMED300WR		Table 9-20

3-8-4 External I/O Connectors

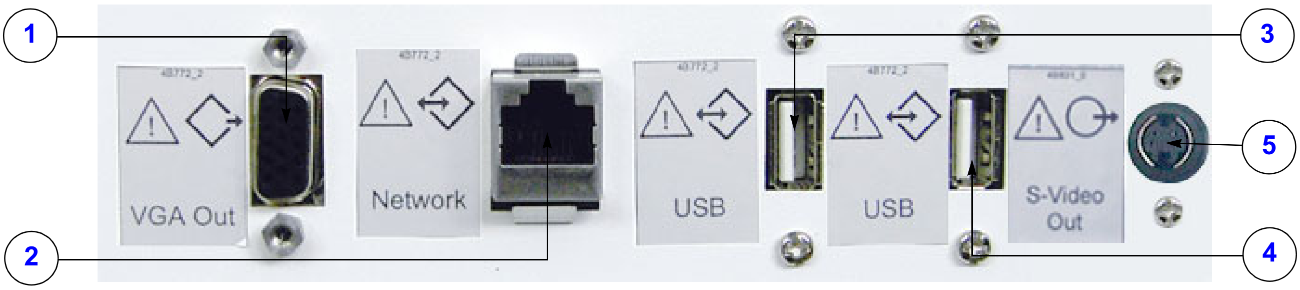


Figure 3-71 External I/O Connectors - on Rear of System

Table 3-10 External I/O Connector - Description

Item	Connector Name	Table Number	Description		
1	VGA OUT	Table 3-13	Connector for external Monitor		
2	NETWORK	Table 3-14	DICOM input/output, twisted pair RJ-45 10/100 megabit/s		
3	USB	Table 3-15	USB-2.0 port		
4	USB	Table 3-15	USB-2.0 port		
5	S-Video OUT	Table 3-16	S-Video Out Connector (**not** available at GES14!)		

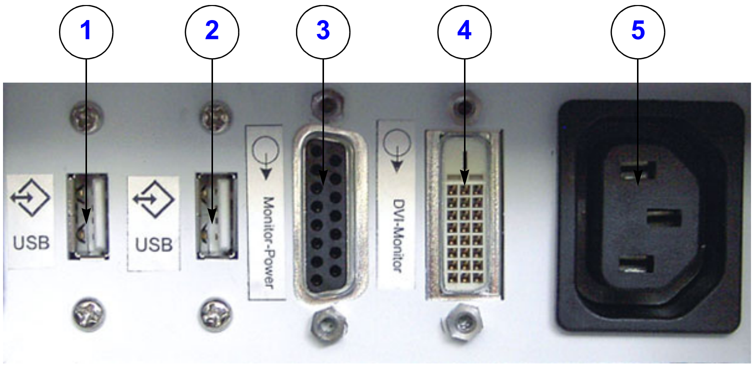


Figure 3-72 External I/O Connectors - on Back of Console

Table 3-11 External I/O Connector - Description

Item	Connector Name	Table Number	Description		
1	USB	Table 3-15	USB-2.0 port		
2	USB	Table 3-15	USB-2.0 port		
3	Monitor Pwr	Table 3-17	Monitor Power		
4	DVI-D Out	Table 3-18	Monitor DVI-D (Digital Visual Interface)		
5	AUX		main outlet for auxiliary devices		

3-8-4 External I/O Connectors (cont'd)

Figure 3-73 External I/O Connectors - next to DVD Drive

Table 3-12 External I/O Connector - Description

Item	Connector Name	Table Number	Description		
1	USB*	Table 3-15	USB-2.0 port		
2	USB*	Table 3-15	USB-2.0 port		

*NOTE: * If these USB cables need to be replaced, use Item No.: 725 in Chapter 9 - Renewal Parts. Remove USB connectors from the metal bracket and use here.*

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

Table 3-13 VGA OUT Connector, Sub-D 15 Pin

Pin No	Output Signal	Description
1	VGA OUT1 R	Red
2	VGA OUT1 G	Green
3	VGA OUT1 B	Blue
4, 9,11,12,15	N/C	N/C
5, 6, 7, 8, 10	GND	GND
13	VGA OUT1 HS	H Sync
14	VGA OUT1 VS	V Sync

Table 3-14 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 3-15 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

Table 3-16 S-Video OUT Connector (4 pin)

Pin No	Output Signal	Description
1	SVIDEO OUT/IN YG	Y (Luma) GND
2	SVIDEO OUT/IN CG	C (Chroma) GND
3	SVIDEO OUT/IN Y	Y (Luma) Signal
4	SVIDEO OUT/IN C	C (Chroma) Signal

Table 3-17 Monitor Power (15 pin)

Pin No	Description
5, 3, 7, 10, 15	12V
1, 5, 8, 9, 11	GND
6 / 14	USB 1- / USB 1+
4, 12, 13	NC (no connection)

Table 3-18 DVI-D OUT Connector

Pin No	Description	Pin No	Description
1	TDMS data 2-	13	TDMS data 3+
2	TDMS data 2+	14	+5 Volt
3	TDMS data 2, 4 shielding	15	ground for +5 Volt
4	TDMS data 4-	16	Hotplug-Detect
5	TDMS data 4+	17	TDMS data 0-
6	DDC clock	18	TDMS data 0+
7	DDC data	19	TDMS data 0, 5 shielding
8	Analog: V-Sync	20	TDMS data 5-
9	TDMS data 1-	21	TDMS data 5+
10	TDMS data 1+	22	TDMS meter shielding
11	TMDS data 1, 3 shielding	23	TDMS clock +
12	TDMS data 3-	24	TDMS clock -

3-8-5 Video Specification

Video specifications may be needed to be able to connect laser cameras or other devices to the Voluson® E8.

DVI-D/VGA-Connector:

- Visible resolution ... 1024x768
- Screen refresh rate ... 60Hz

S-Video Connector:

- Type: Separate Video (Y/C)
- Video modes: PAL (50Hz), NTSC (60Hz)

Section 3-9
Available Probes

See *Chapter 9 - Probes, on page 9-36*, 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 3-66 and
- Section 3-8-2 "Measure Setup" on page 3-70

NOTICE More detailed information pertaining System Setup and Measure Setup adjustments is found in the Voluson® E8 Basic User Manual, which is available in different languages.

Section 3-11
Connectivity Setup

The Voluson® E8 ultrasound systemcan 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® E8 ultrasound unit and other devices in the hospital information system.

The following scenarios are covered:

- A stand-alone Voluson® E8 scanner; see: Section 3-11-1-3 on page 3-78.
- A Voluson® E8 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 3-78.
- A Voluson® E8 and a DICOM server in a network; see: Section 3-11-1-5 on page 3-78.

3-11-1-1 The Dataflow Concept

Communication between the Voluson® E8 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 3-74 on page 3-77).

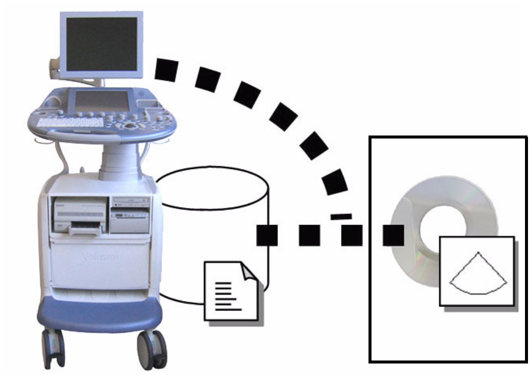
Patient information can include demographic data and images, as well as reports and Measurement and Analysis (M&A) data.

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.

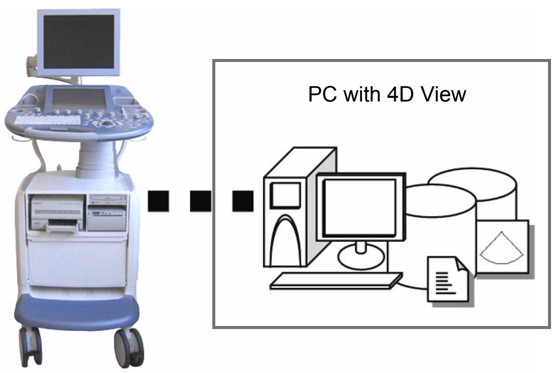
By utilizing data flows, the user can configure the Voluson® E8 ultrasound unit to optimally meet the needs of the facility, while keeping the user interface unchanged. Once the dataflow is selected, the actual location of the database is entirely transparent.

3-11-1-2 Dataflow Examples

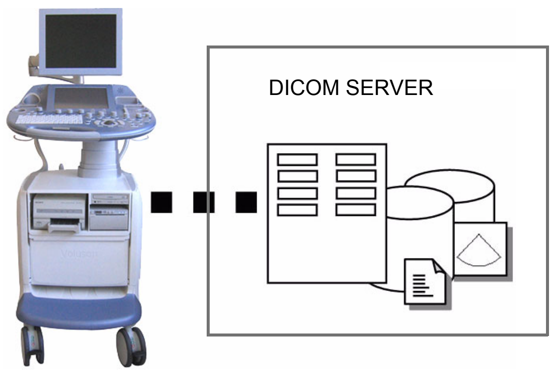
The local database is used for patient archiving.
Images are stored to internal hard drive.



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 3-74 Examples of Dataflows

3-11-1-3 Stand-alone Voluson® E8

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® E8.

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® E8 + 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® E8 scanners without being connected in a network.

The images are first stored on the Voluson® E8 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® E8.

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® E8 and DICOM Server

In this configuration, the Voluson® E8 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® E8.
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® E8 to the Peer-to-Peer Network.

For more details refer to Section 3-12 "Network IP Address Configuration" on page 3-87.

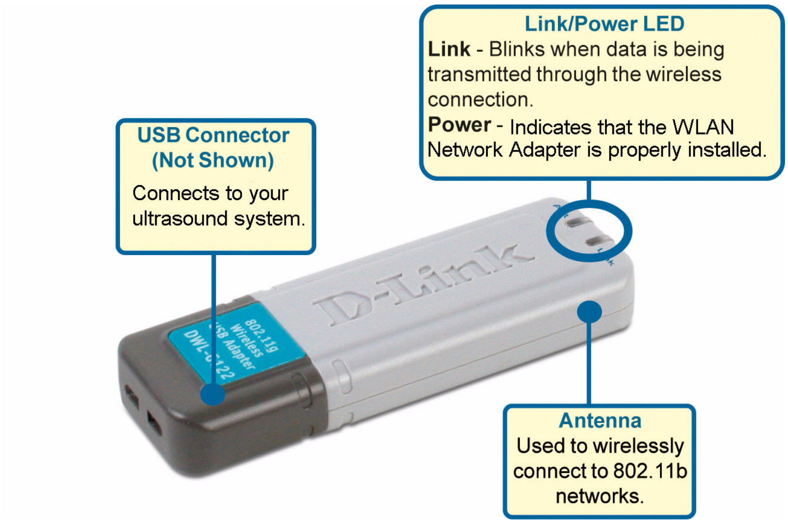
3-11-2 Wireless Network Configuration

The procedure to configure the Voluson® E8 system for a wireless network environment depend on the used Wireless Network Adapter:

- Configuration of “D-Link” WLAN Adapter on page 3-79
- Configuration of “Netgear” WLAN Adapter on page 3-84

3-11-2-1 Configuration of “D-Link” WLAN Adapter

BT Version: The Wireless Network USB Adapter is only applicable at Voluson® E8 systems with BT08 software.



NOTICE To configure the Voluson® E8 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 3-5-7 on page 3-38.
2.) Press the **UTILITIES** key on the control panel and touch 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.

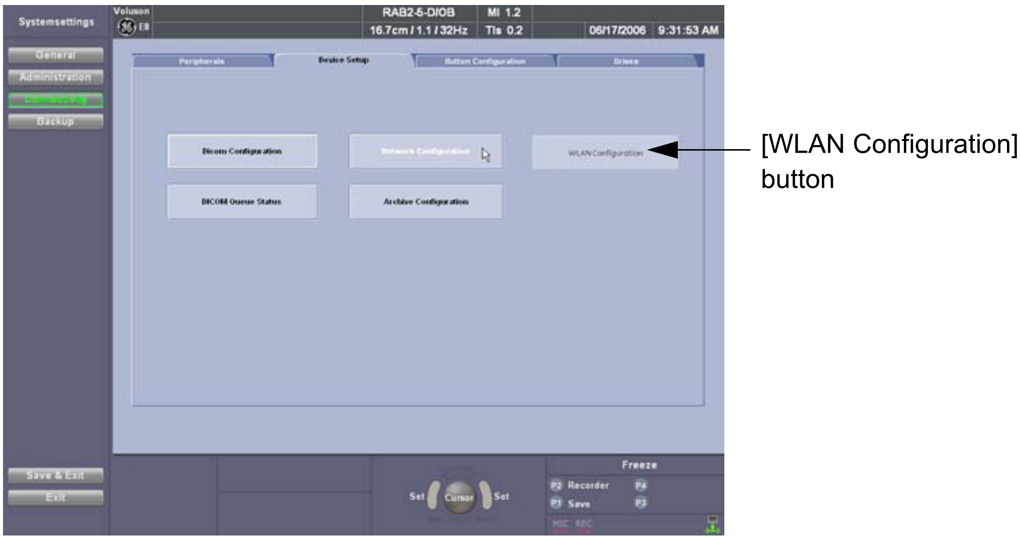


Figure 3-75 WLAN Configuration button

3-11-2-1 Configuration of "D-Link" WLAN Adapter (cont'd)

5.) Select the **CONFIGURATION** tab, enter "SSID", check/adjust all other settings and then click APPLY.

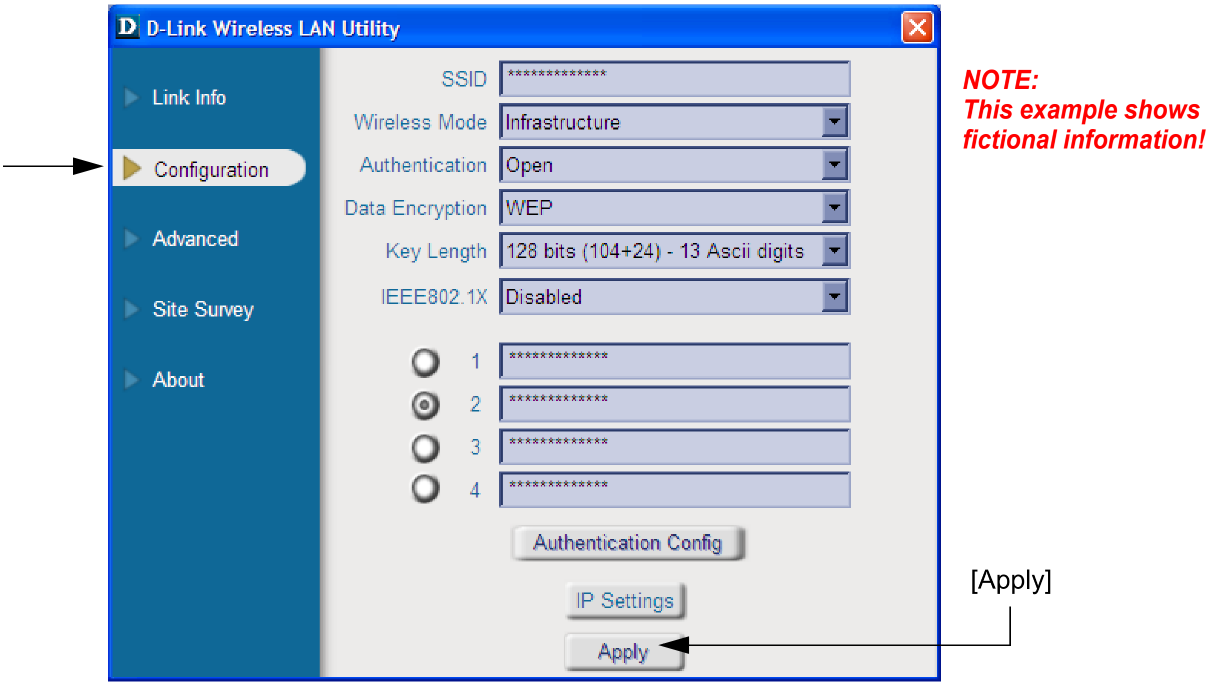


Figure 3-76 WLAN - Configuration

NOTE: *For detailed description of available parameters, refer to Section 3-11-2-1-1 "Description of "D-Link" Configuration Parameters" on page 3-82.*

6.) Select the **SITE SURVEY** tab, highlight the currently adjusted "Profile" and then click CONNECT.

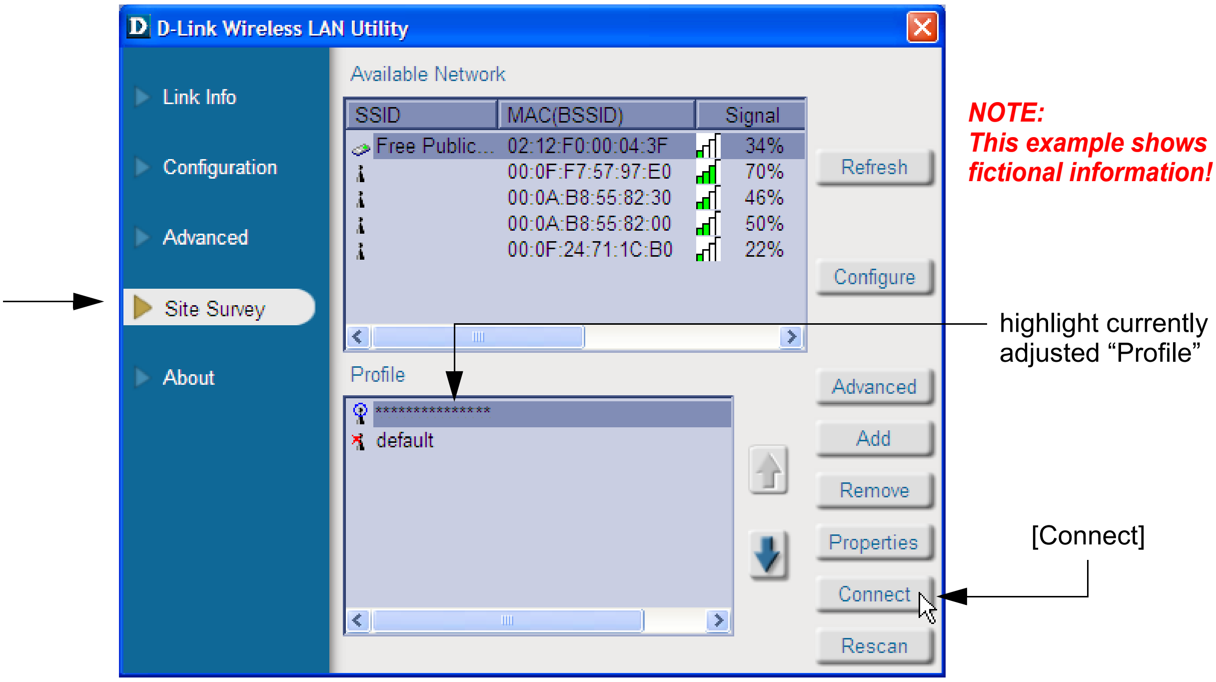


Figure 3-77 WLAN - Site Survey

3-11-2-1 Configuration of "D-Link" WLAN Adapter (cont'd)

7.) Finally select the LINK INFO tab and wait a few seconds...
As soon as the "Connection Info" field shows ***Connected***, you have successfully installed WLAN, are connected to a wireless network and are ready to communicate!

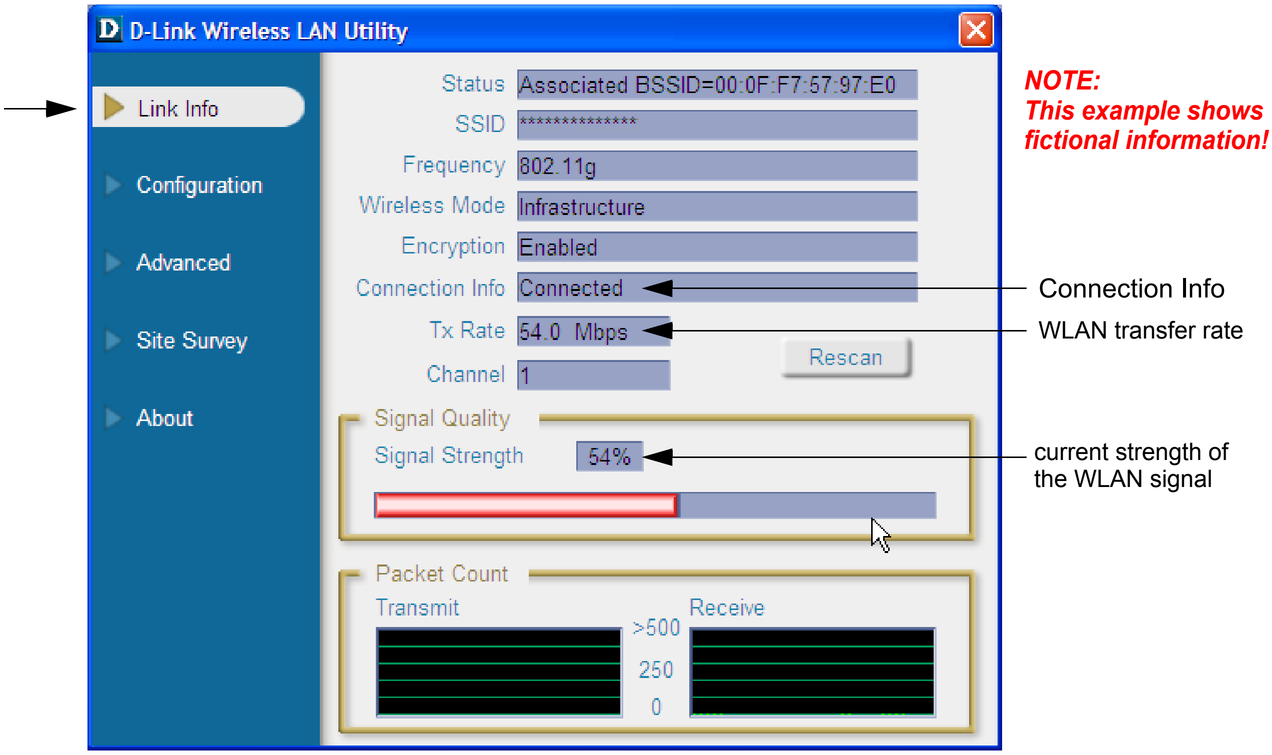


Figure 3-78 WLAN- Link Info

NOTE: For detailed description, refer to Section 3-11-2-1-2 "Description of "D-Link" Link Info Parameters" on page 3-83.

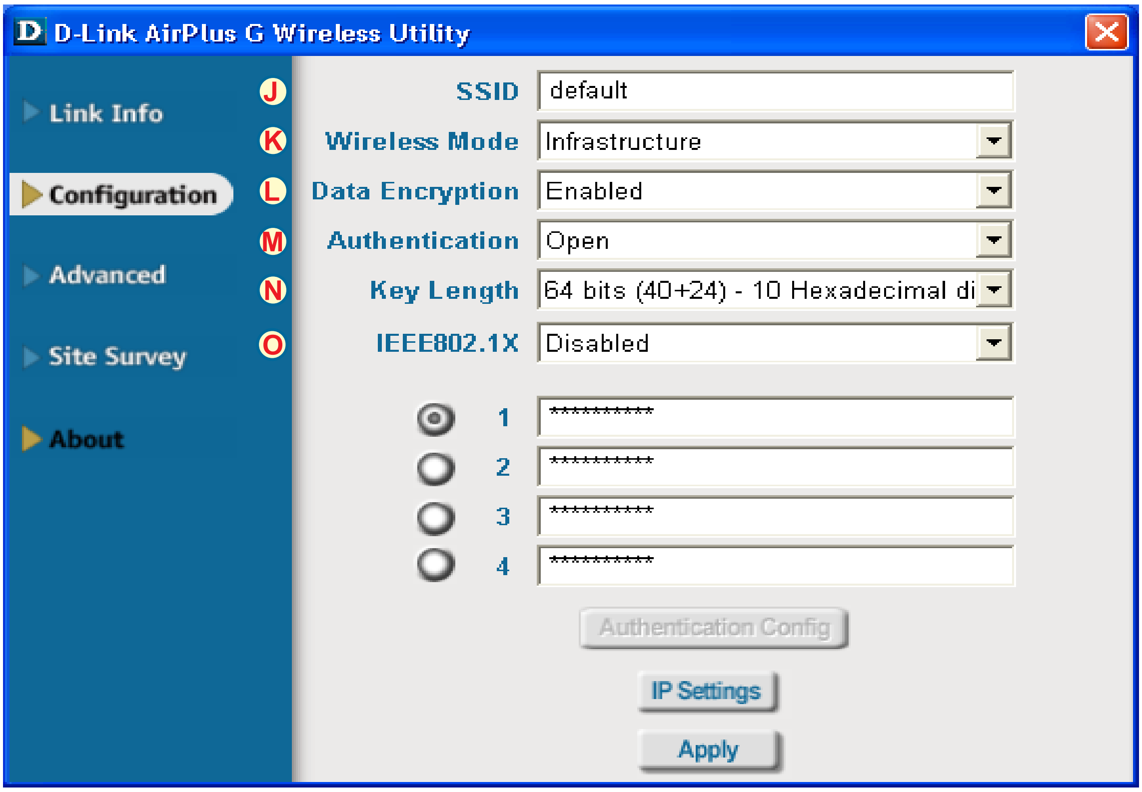
NOTICE **Once the Wireless Network is configured:**
After a few seconds waiting, the field [Connection Info] on the "Link Info" screen (see: Figure 3-78) should show ***Connected*** and the other values are entered automatically, whenever the WLAN CONFIGURATION button (see: Figure 3-75 on page 3-79) is clicked.

3-11-2-1-1 Description of “D-Link” Configuration Parameters

J. SSID: The Service Set Identifier is the name assigned to the wireless network. The factory SSID setting is set to **default**. Make changes here to match the SSID on existing Wireless Router or Access Point.

K. Wireless Mode: The factory setting is set to **Infrastructure**. Ad-Hoc mode is used for peer-to-peer networking.

L. Data Encryption: The default setting is set to **Disabled**. The adapter supports WEP when encryption is enabled.



M. Authentication: You can specify the authentication mode for the wireless network. The default setting is set to **Open Authentication**.

N. Key Length: When encryption is enabled, you will have the option to specify the level and key format of the encryption used. Select the appropriate Key Index : 1-4 and enter ACSII or hexadecimal digits in the appropriate field.

O. IEEE802.1X: When encryption is enabled, you will have the option to specify if you wish to use 802.1X authentication.

Figure 3-79 Configuration

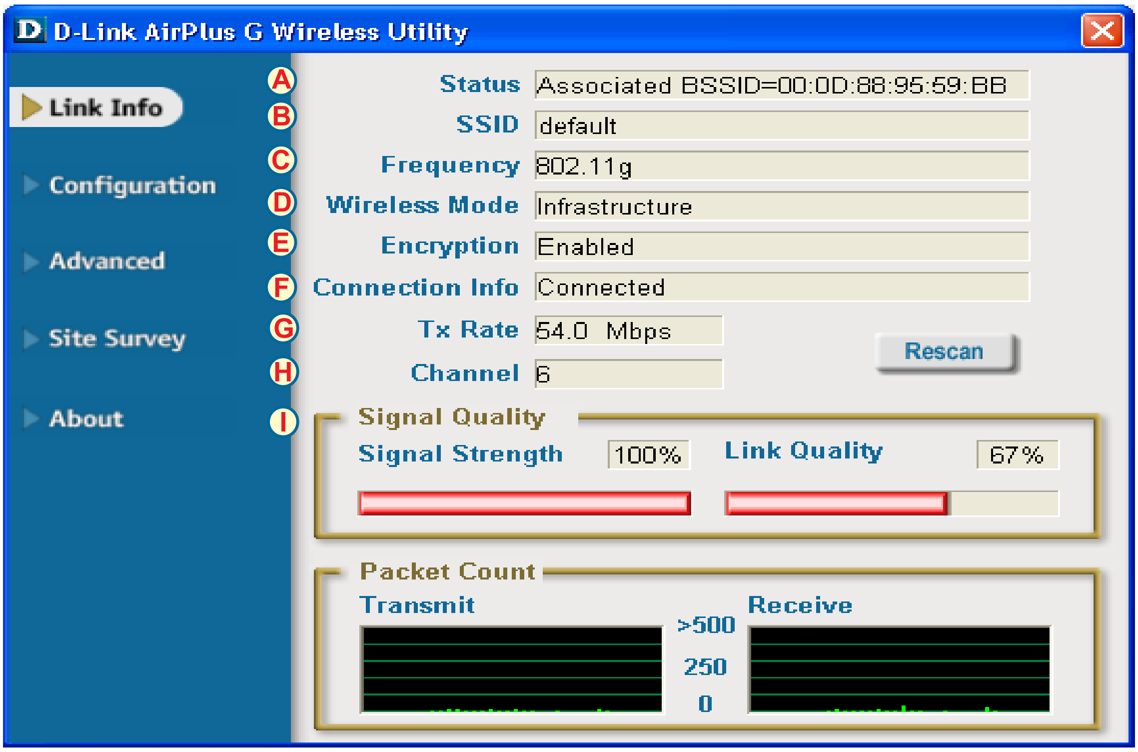
3-11-2-1-2 Description of “D-Link” Link Info Parameters

A. Status: Displays the MAC Address of the Access Point that is associated with the DWL-G122.

B. SSID: The Service Set Identifier is the name assigned to the wireless network. The factory SSID setting is set to **default**.

C. Frequency: Displays the current frequency used by the adapter.

D. Wireless Mode: The factory setting is set to Infrastructure. Ad-Hoc mode is used for peer-to-peer networking.



E. Encryption: Displays the current encryption status of the wireless connection.

F. Connection Info: Displays your current Connection State.

G. TxRate: TxRate settings are automatically determined by the DWL-G122 depending on the distance from the access point.

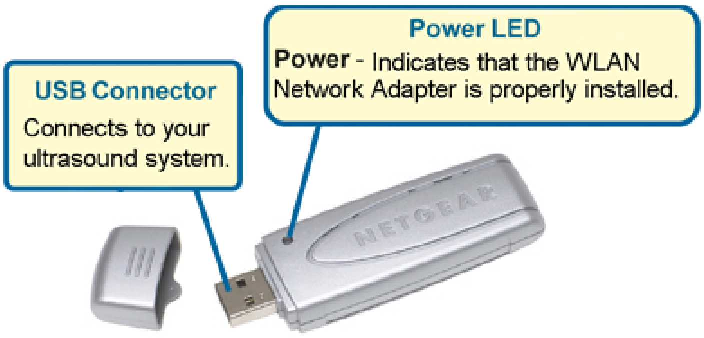
H. Channel: Displays the channel information. By default, the channel is set to 6. Please note that the DWL-G122 will automatically adjust channel depending on the Access Point.

I. Signal Strength / Link Quality: Represents the wireless signal quality and strength between the access point and the DWL-G122. The percentage coincides with the graphical bar.

Figure 3-80 Link Info

3-11-2-2 Configuration of "Netgear" WLAN Adapter

BT Version: The Wireless Network USB Adapter is only applicable at Voluson® E8 systems with BT08 software. Software version **7.0.2** or higher is required!



NOTICE To configure the Voluson® E8 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 3-5-7 on page 3-38.
2.) Press the **UTILITIES** key on the control panel and touch 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.

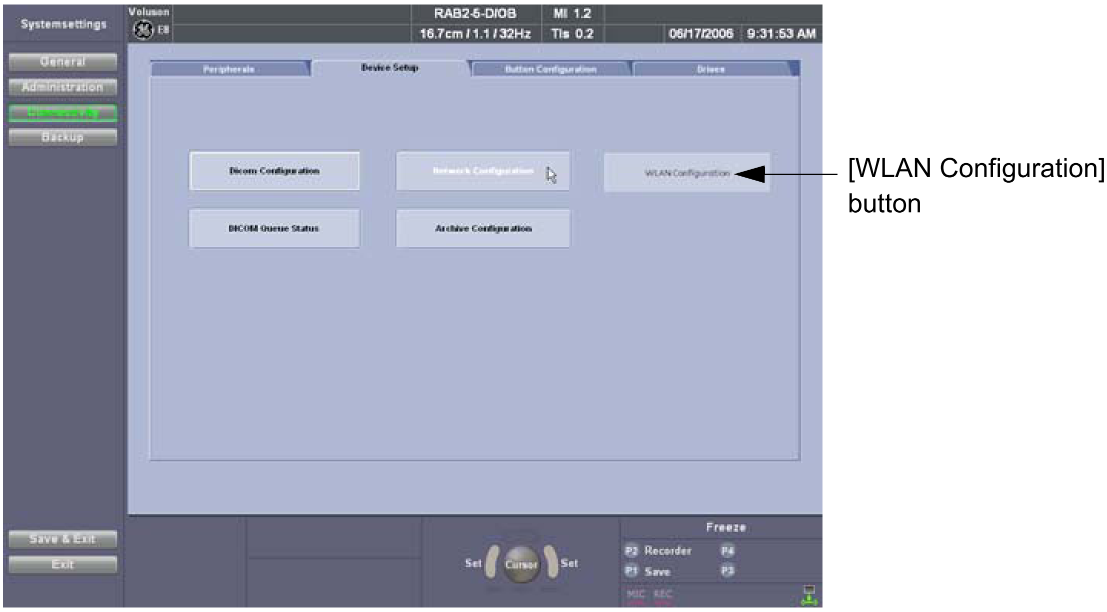


Figure 3-81 WLAN Configuration button

3-11-2-2 Configuration of "Netgear" WLAN Adapter (cont'd)

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

Figure 3-82 select the country

The Setup Wizard window appears:

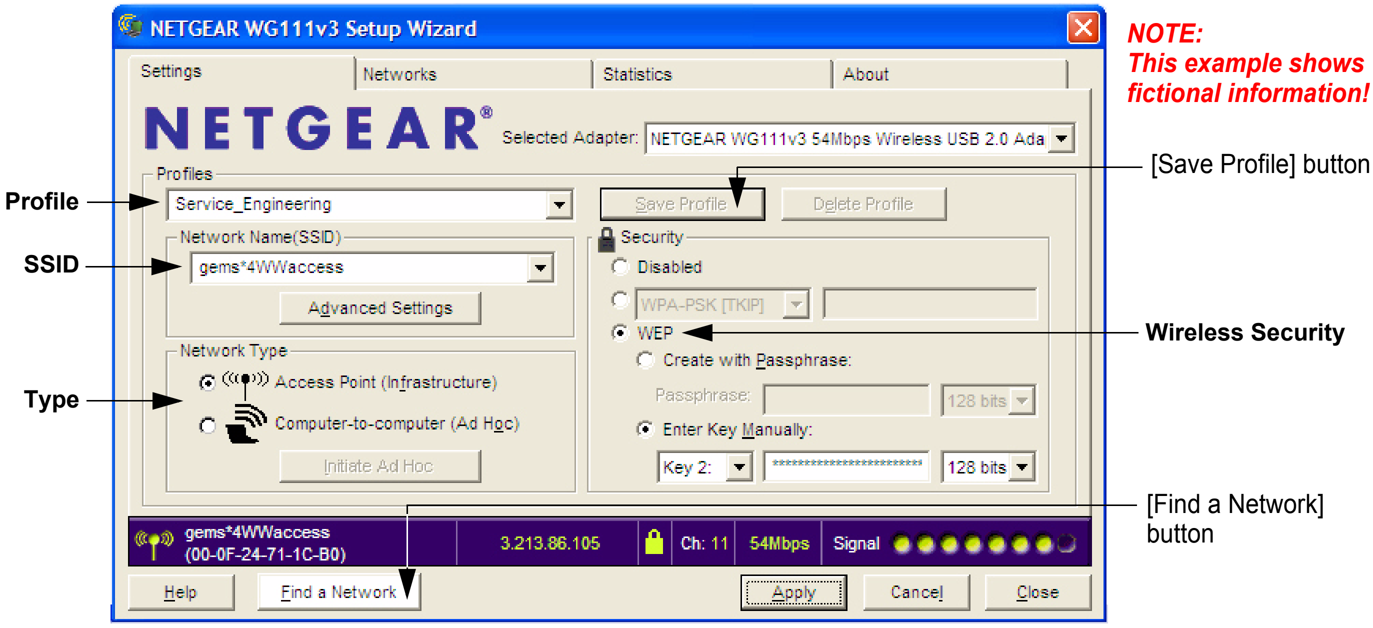


Figure 3-83 Setup wizard - Settings

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

NOTE: *For detailed description of available parameters, refer to Section 3-11-2-2-1 "Description of "Netgear" Configuration Parameters" on page 3-86.*

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....

3-11-2-2 Configuration of "Netgear" WLAN Adapter (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!

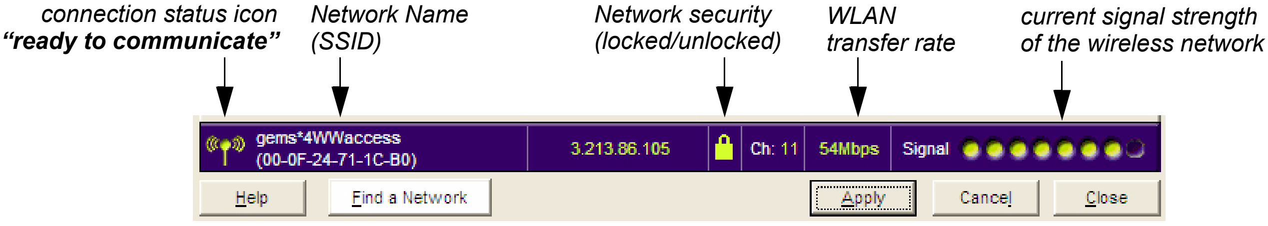


Figure 3-84 Status bar at bottom of the page

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 3-84 above) and the other values are shown automatically, whenever the WLAN CONFIGURATION button (see: Figure 3-81 on page 3-84) is clicked.

3-11-2-2-1 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 Make sure that you know the security settings for the network that you want to use.
For example, if WEP is used then you need to know the WEP key.
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.

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® E8.
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 touch 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.

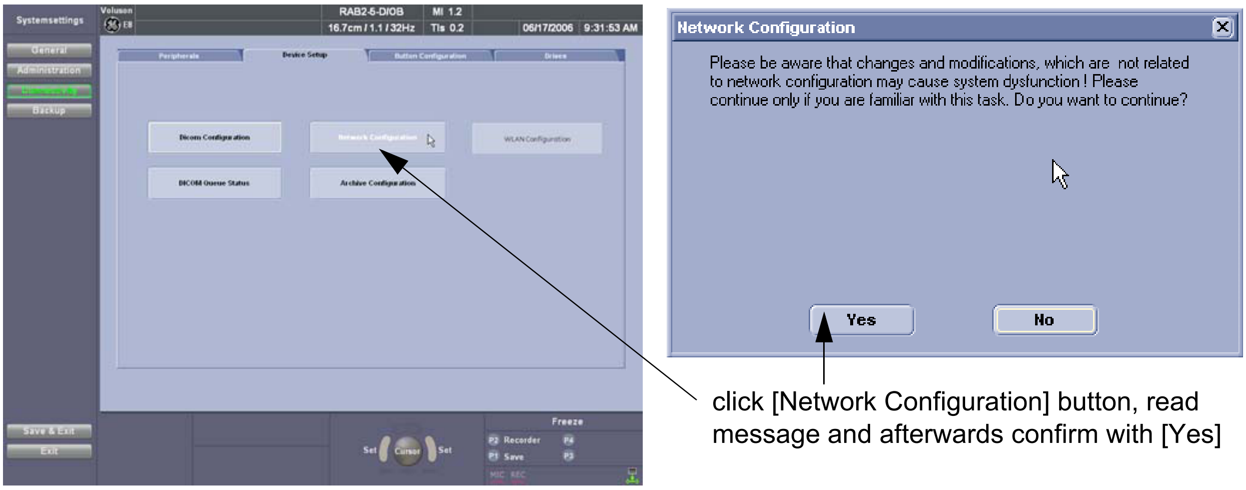


Figure 3-85 Network Configuration

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

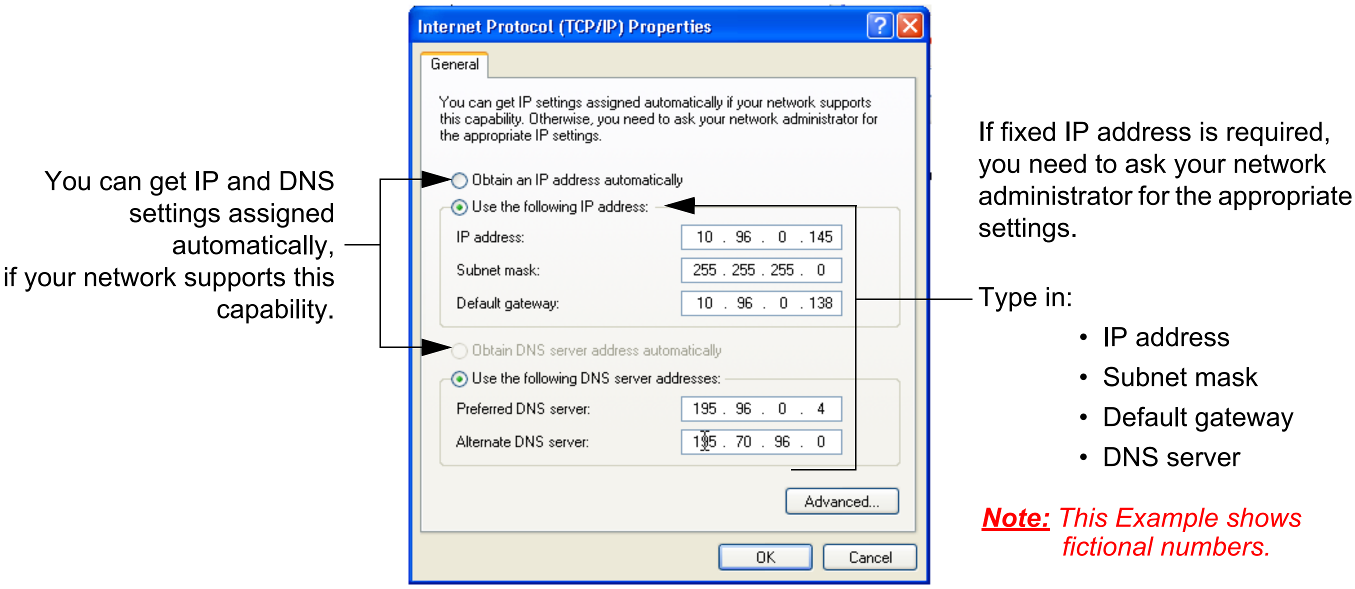


Figure 3-86 Internet Protocol (TCP/IP)

To specify a DICOM Address, follow the instructions of described in the Basic User Manual, Chapter 17 of the Voluson® E8.

3-12-1 Map Network Drive

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

2.) In the “Utilities” menu touch 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.

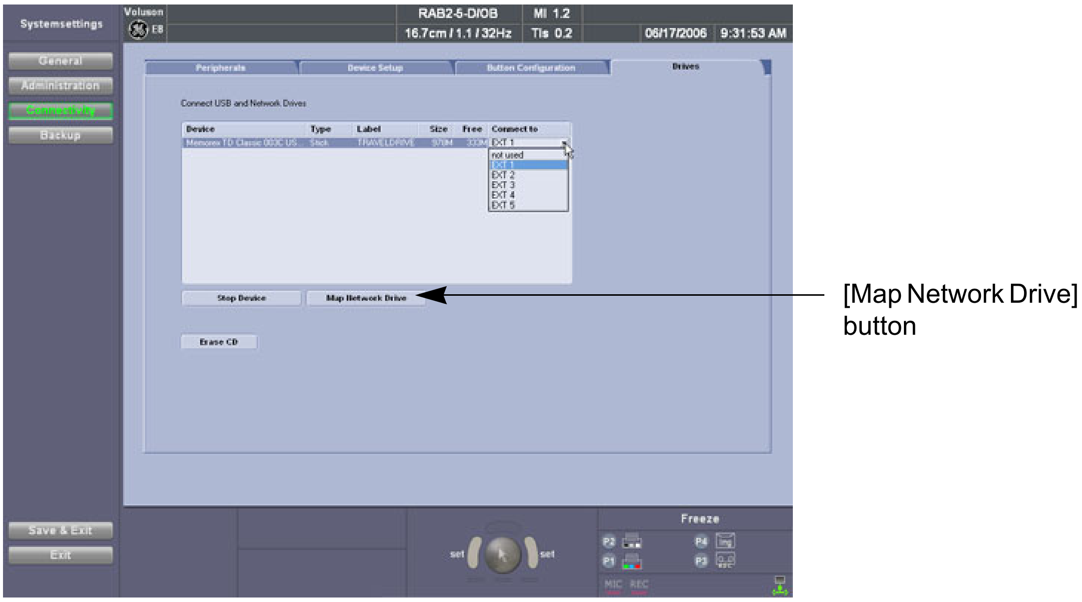


Figure 3-87 System Setup - Connectivity - DRIVES page

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 3-88 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 **USB** (= F5) 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® E8
SN:

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® E8

Host Name		**Local Port**		**IP Address**	. . .
AE Title				**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				. . .	

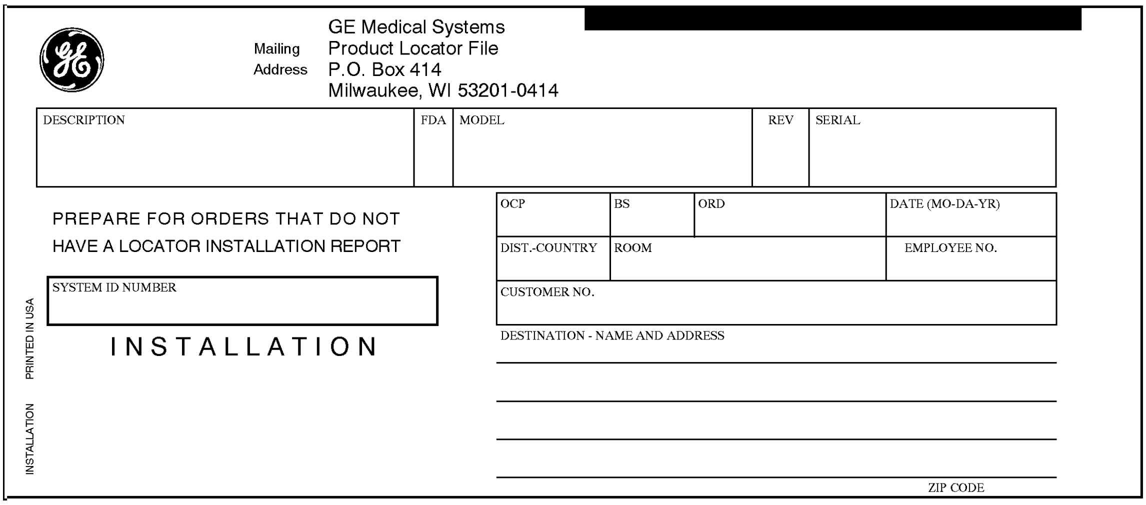
Figure 3-89 Worksheet for DICOM Network Information

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.


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

DESCRIPTION	FDA	MODEL	REV	SERIAL

PREPARE FOR ORDERS THAT DO NOT
HAVE A LOCATOR INSTALLATION REPORT

SYSTEM ID NUMBER

INSTALLATION

OCP	BS	ORD	DATE (MO-DA-YR)
DIST.-COUNTRY	ROOM		EMPLOYEE NO.
CUSTOMER NO.			

DESTINATION - NAME AND ADDRESS

ZIP CODE

INSTALLATION PRINTED IN USA

Figure 3-90 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® E8 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® E8 Basic User Manual; see: Table 9-21, "System Manuals - Voluson® E8 / Voluson® E8 Expert," on page 9-35.

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 9-36* 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.

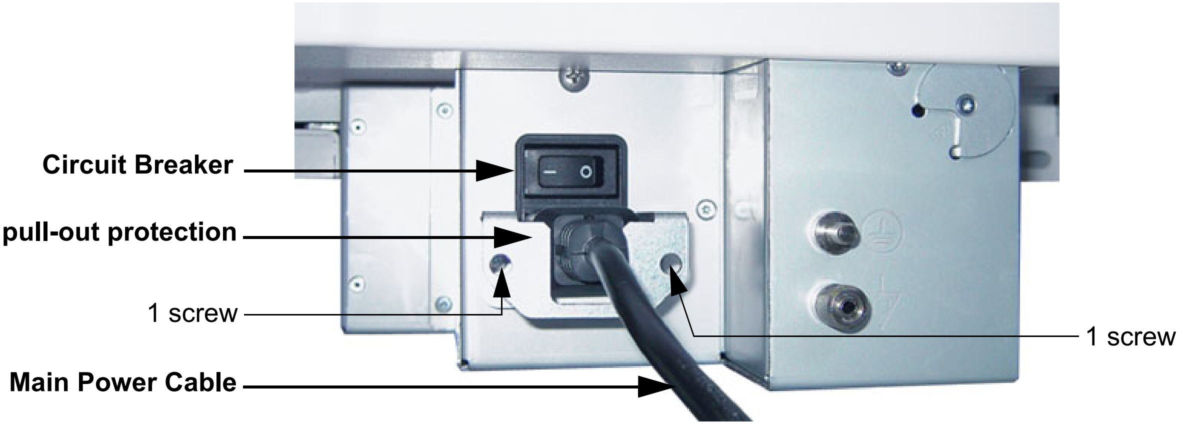


Figure 4-1 Circuit Breaker, pull-out protection and main power cable at rear of system

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 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.*

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 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.*

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.

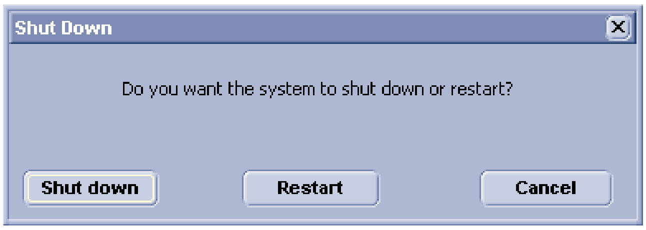


Figure 4-3 Shutdown, Restart or Cancel

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.

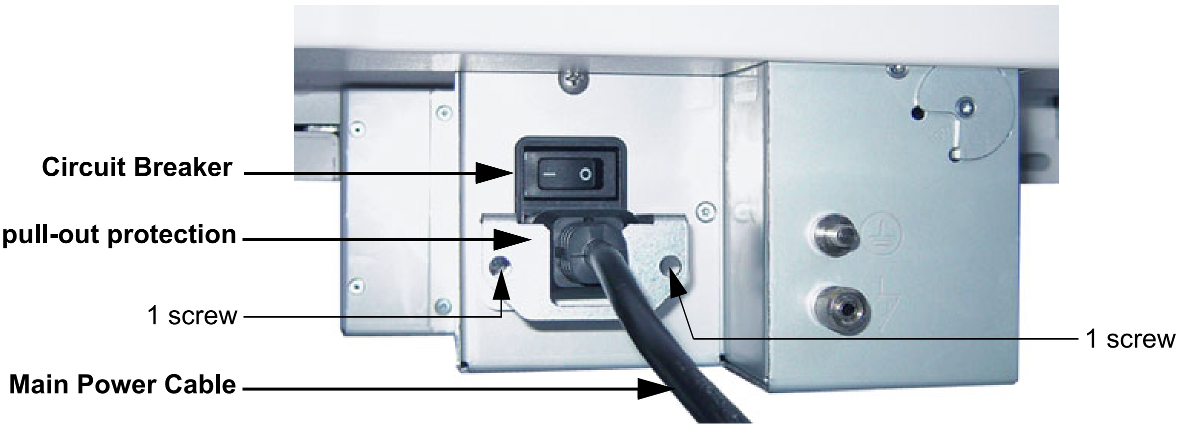


Figure 4-4 Circuit Breaker, pull-out protection and main power cable at rear of system

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

7.) Disconnect probes. (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).

4-3-3 System Features

4-3-3-1 Control Panel

Figure 4-5 Control Panel Tour

1	Touch Panel screen	**9**	Trackball and Trackball keys
2	Touch Panel rotary & toggle flip switch controls	**10**	Button for Control Panel Rotation
3	TGC - Slider Controls	**11**	Mode keys, rotary controls used in 3D/4D Mode
4	Screen Format keys	**12**	Keyboard and F1 key (to invoke EUM)
5	3D and 4D Volume Mode keys	**13**	additional Mode keys
6	HR-Zoom/Pan Zoom rotary control (toggle)	**14**	DVD/VCR button (not labeled at BT06 systems)
7	Remote control keys (programmable)	**15**	Button for Control Panel Elevation
8	Freeze / Run key	**16**	ON/OFF Power Switch

4-3-3-2 Touch Panel

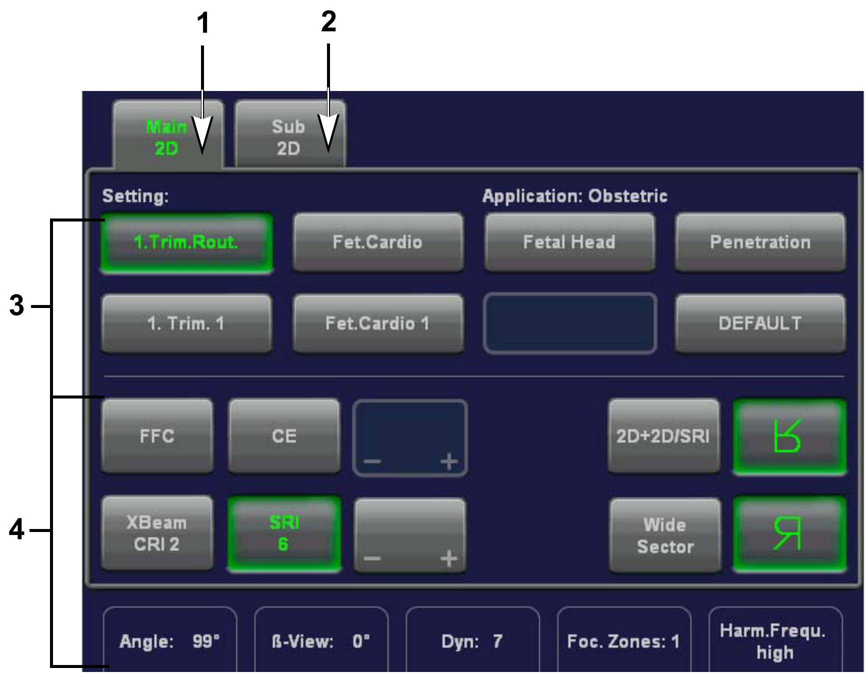


Figure 4-6 Touch Panel - Main Menu

1.) Main menu key: to change from “Sub menu” back to appendant “Main” mode menu
2.) Sub menu key: the “Sub menu” (to adjust settings of the selected “Main” mode) is displayed
3.) Setting window: shows all settings for the active application. The active one is highlighted.
4.) Additional functions which are supported by the selected Mode.

NOTE: *Different menus are displayed depending on which Touch Panel menu is selected.*

At the bottom of the Touch Panel, there are combination rotary dials/push buttons and flip switch controls. The functionality of these controls changes, depending upon the currently displayed menu.

4-3-3-3 Monitor Display

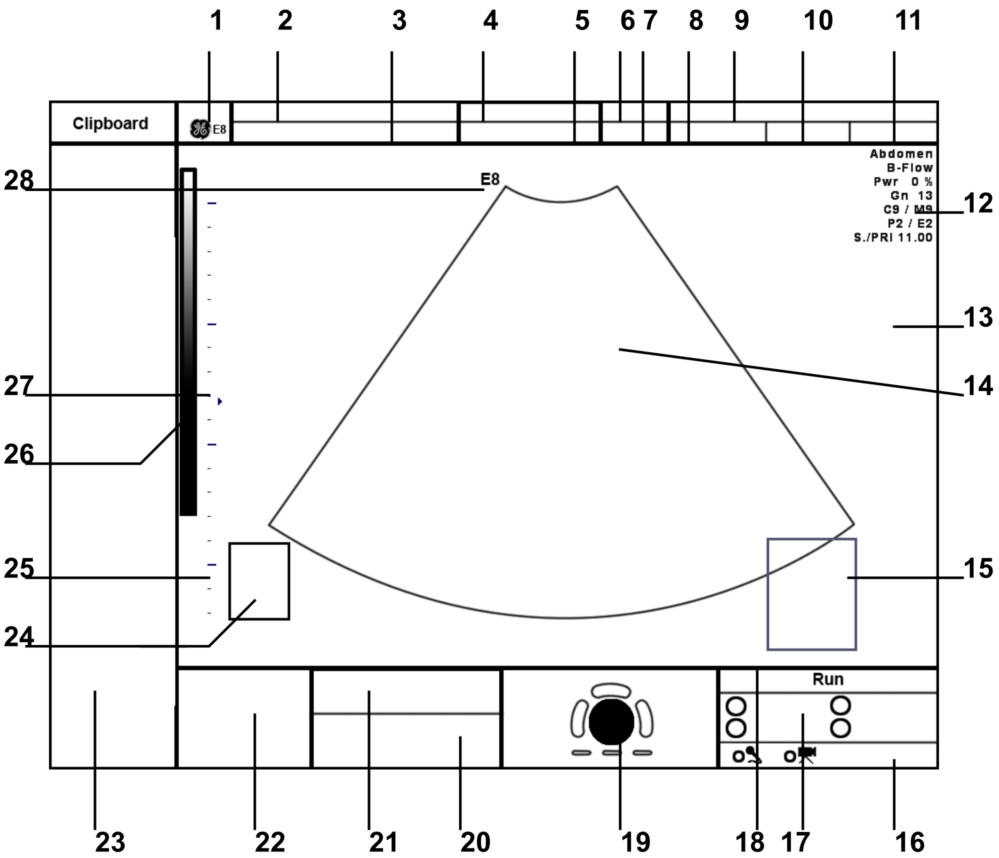


Figure 4-7 Monitor Display Tour

Table 4-2 Monitor Display Features

1. Logo	15. Measurement results
2. Patient Name (Last-, First-, Middle Name)	16. Status area of Network, Recorder, Microphone, etc.
3. Patient ID-number ; GA (Gestational Age)	17. Status area of **P1**, **P2**, **P3** and **P4** keys
4. Probe / Application	18. Status area of current operation state (Freeze/Run/Cine)
5. Depth / Frame rate	19. Status area of the trackball and trackball keys
6. Mechanical Index	20. reserved for future use
7. Thermal Index	21. Message area
8. Sonographers Name	22. Clipboard History
9. Hospital Name (Identification)	23. Current Clipboard
10. Date	24. Body marker
11. Time	25. Depth scale markers
12. Image Info	26. Gray scale wedge
13. TGC curve	27. Focal zones marker
14. Image area	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 4-12
  - B-Flow
  - XTD-View
  - Coded Contrast Imaging
- M Mode, see: Section 4-4-3 on page 4-14
  - MCFM Mode
- Spectral Doppler Modes, see: Section 4-4-4 on page 4-16
  - PW - Pulsed Wave Doppler
  - CW - Continuous Wave Doppler
- Color Doppler Modes, see: Section 4-4-5 on page 4-17
  - CFM - Color Flow Mode
  - PD - Power Doppler
  - TD - Tissue Doppler
  - HD-Flow - Bi-Directional Angio
- Volume Modes, see: Section 4-4-6 on page 4-19
  - 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 Touch Panel Menu and which Mode is selected.
Some function keys only appear on the Touch Panel if they are available for the selected probe.*

4-4-1 2D Mode Checks

Figure 4-8 2D Main and 2D Sub Menu

Table 4-3 2D Mode Functions

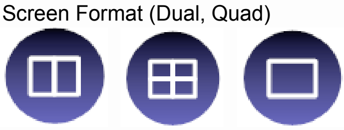
Step	Task	Expected Results
1	2D Mode Gain	Rotate the **2D MODE** key to adjust the sensitivity (brightness) of the entire image.
2	Transmit Power &  Acoustic Output of speakers	Transmit Power: Optimizes image quality and allows user to reduce beam intensity. push/dial Toggle control Acoustic Output: 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.
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	Screen 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.

Table 4-3 2D Mode Functions

Step	Task	Expected Results
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	HR Zoom &   Image Magnification	HR Zoom Image magnification of selected image area. push/dial Toggle control Image Magnification: Image Magnification of complete image in read and write mode.
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	2D+2D/SRI	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 SRI information.
14	2D+2D/SRI CRI	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 SRI and XBEAM CRI information.
15	WIDE SECTOR **BT Version:**	Extends the field of view of curved array probes by means of beam steering. This feature is only available at Voluson® E8 systems with BT08 software.
16	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.
17	Image Orientation	Use the LEFT/RIGHT respectively the UP/DOWN keys on the Touch Panel to alternate the image orientation.
18	**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.
19	**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.
20	**DYN**	Dynamic Range controls how echo intensities are converted to shades of gray, thereby increasing the adjustable range of contrast.
21	**FOC. ZONES**	Increases the number of transmit focal zone, so that you can tighten up the beam for a specific area.
22	**FREQUENCY** resp. **HARM.FREQU.**	To adjust the range of the receive frequency. high resolution / lower penetration, mid resolution / mid penetration, or lower resolution / high penetration

Table 4-3 2D Mode Functions

Step	Task	Expected Results
23	**OTI** (Otimized Tissue Imaging)	OTI™ allows to “fine tune” the system for scanning different kinds of tissue.
24	GRAY MAP	A gray map determines the displayed Brightness of an echo in relationship to its amplitude.
25	TINT MAP	A Tint map determines the Chroma value (color tone and saturation) of an echo in relationship to its amplitude.
26	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.
27	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.
28	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.
29	LINE DENSITY	Control to improve the resolution by reducing the frame rate. Respectively reducing the resolution by increasing the image frame rate.
30	ENHANCE	Edge Enhance brings out subtle tissue differences and boundaries by enhancing the gray scale differences corresponding to the edges of structures.
31	REJECT	Selects a level below which echoes will not be amplified (an echo must have a certain minimum amplitude before it will be processed).

For further details refer to the Voluson® E8 Basic User Manual, Chapter 5, 2D Mode.

4-4-2 Additional (optional) Operating Modes

4-4-2-1 B-Flow Check

B-Flow On/Off switch

Press the **BF** key to activate/deactivate the B-Flow mode.

Figure 4-9 B-Flow Main and B-Flow Sub Menu

For further details refer to the Voluson® E8 Basic User Manual, Chapter 5.5.

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 4-10 XTD-View Main Menu

For further details refer to the Voluson® E8 Basic User Manual, Chapter 5.6.

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 4-11 Contrast Main and Contrast Sub Menu

For further details refer to the Voluson® E8 Basic User Manual, Chapter 5.7.

4-4-3 M Mode Checks

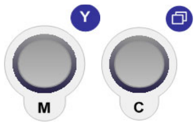
Figure 4-12 M Main and M Sub Menu

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	M Mode Depth	Common with 2D Mode Depth.
5	SPEED	By touching up or down, four different sweep speeds can be selected.
6	INVERT	Invert of the M Mode image. (Function is only available with endovaginal probes.)
7	**FREQUENCY** resp. **HARM.FREQU.**	Common with 2D Mode Frequency resp..
8	DISPLAY FORMAT	For selection of different rations of display format.
9	REJECT	It determines the amplitude-level below which echoes are suppressed (rejected).
10	DYN.CONTR.	Dynamic Range enhances a part of the grayscale to make it easier to display pathology.
11	ENHANCE	Due to this function a finer, sharper impression of the image is produced.

For further details refer to the Voluson® E8 Basic User Manual, Chapter 6, 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 4-13 MCFM Main and MCFM Sub Menu

For further details refer to the Voluson® E8 Basic User Manual, Chapter 6.4.

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.*

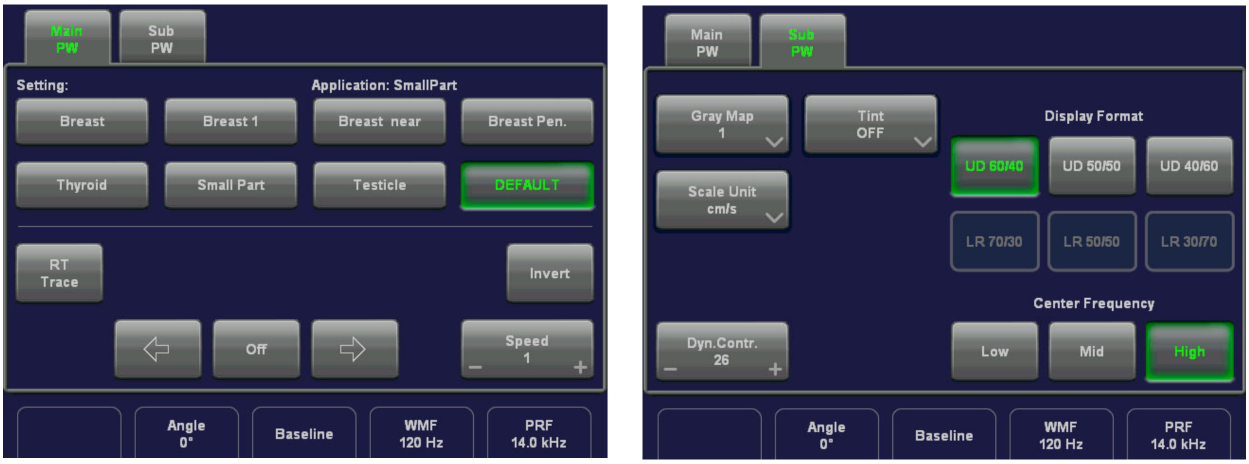


Figure 4-14 PW Main and PW Sub Menu

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

Step	Task	Expected Results
1	Gate Position and Gate Size	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 Doppler Mode	Press the **right trackball key** to activate the motion display. Press the **left trackball key** to activate both Modes (B/D).
3	Doppler Gain	Rotate the **PW MODE** key to adjust the amplification of the entire spectrum.
4	STEERING	The steering function is only available with linear probes.
5	SPEED	By touching up or down, four different sweep speeds can be selected.
6	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.
7	INVERT	To invert the Doppler spectrum display in relation to the direction of the flow.
8	**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°.
9	**BASELINE**	Adjusting the baseline is possible in read- and write Mode (up/down in 8 steps).
10	**WMF** (Wall Motion Filter)	Used to eliminate Doppler “noise” that is caused by vessel wall motion.
11	**PRF**	The Velocity Range display is governed by the pulse repetition frequency (PRF) Exceeding the maximum PRF, the HPRF-Mode is automatically switched on.
12	DYN. CONTR.	Dynamic Range adjusts the display cutoff of the Doppler analysis waveform.
13	CENTER FREQUENCY	It serves for selection of the required transmit frequency.
14	SCALE UNIT	To select the displayed measuring unit (in relation to the zero-line).
15	DISPLAY FORMAT	For selection of different rations of display format.

For further details see: Voluson® E8 Basic User Manual, Chapter 7, Spectral 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 *key (to activate the Bi-Directional Angio Mode) can be seen.*

Figure 4-15 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.
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 touching toward up the PRF increases. By touching 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).

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

Step	Task	Expected Results
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, touch the CFM MAP (PD, HD-Flow, TD) key in the Submenu.
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® E8, Basic User Manual:

- Chapter 8, CFM Mode (Color Flow Mode)
- Chapter 9, PD Mode (Power Doppler Mode)
- Chapter 9, HD-Flow Mode (Bi-Directional Angio Mode)
- Chapter 10, TD Mode (Tissue Doppler Mode)

4-4-6 Volume Mode Checks

NOTICE Real Time 4D, STIC, VCI, TUI, VOCAL II, VCAD Heart, STIC Oncology and SonoAVC are Options. If these options are not part of the system configuration, the appendant checks can be omitted.

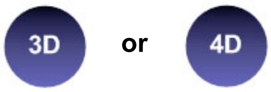
BT Version: The options “STIC Oncology” and “SonoAVC” are only applicable at systems with BT08 software.

NOTE: Different menus are displayed depending on which Touch Panel menu and which Volume Mode is selected.

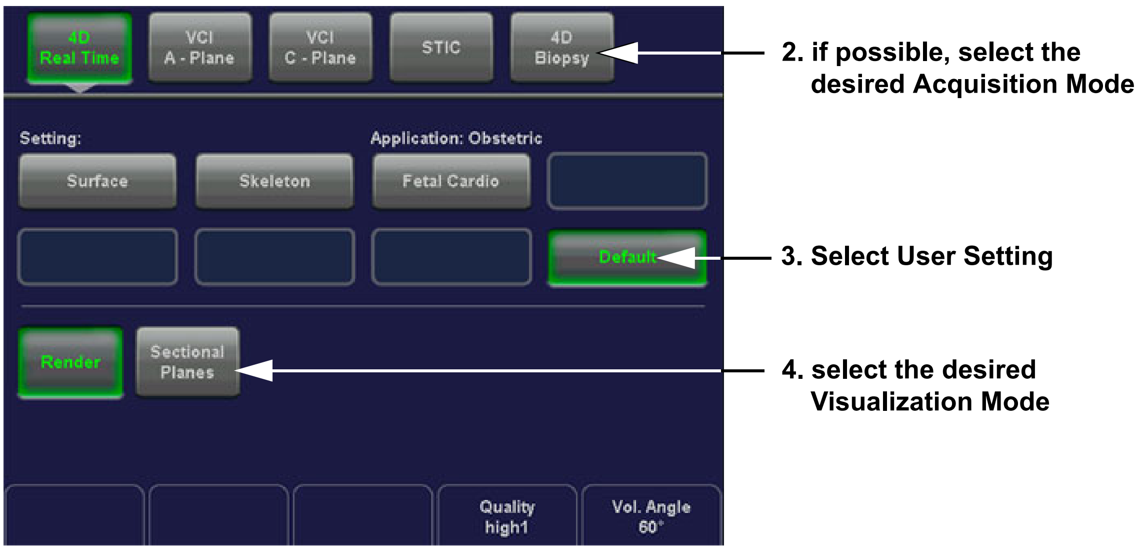
NOTE: Some function keys only appear on the Touch Panel if they are available for the selected Probe.

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

1. select the desired Volume Mode:



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



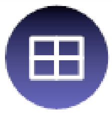
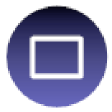
5. Start the Volume Acquisition with the Freeze key resp. the right trackball key.

Figure 4-16 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)
	• 4D REAL TIME	Real Time 4D - continuous volume acquisition and parallel calculation of 3D rendered images

Table 4-7 Pre-Volume Mode Functions

Step	Task	Expected Results
	• VCI A-PLANE	Volume Contrast Imaging - improves the contrast resolution and the signal / noise ratio and therefore facilitates finding of diffuse lesions in organs
	• VCI C-PLANE	Volume Contrast Imaging (coronal plane) - improves the contrast resolution and the signal / noise ratio and therefore facilitates finding of diffuse lesions in organs
	• 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).
	• VOCAL	The basic idea behind VOCAL II 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.
	• VCAD HEART	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.
	• SONOAVC **BT Version:**	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. This feature is only available at Voluson® E8 systems with BT08 software.
	• 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.
	• VCI STATIC	The data set is represented such as in Static 3D - Sectional Planes. However, the three planes are VCI renderings (tissue information of a thick slice), computed from the 3D data set.

4-4-6-2 Functions after the Acquisition

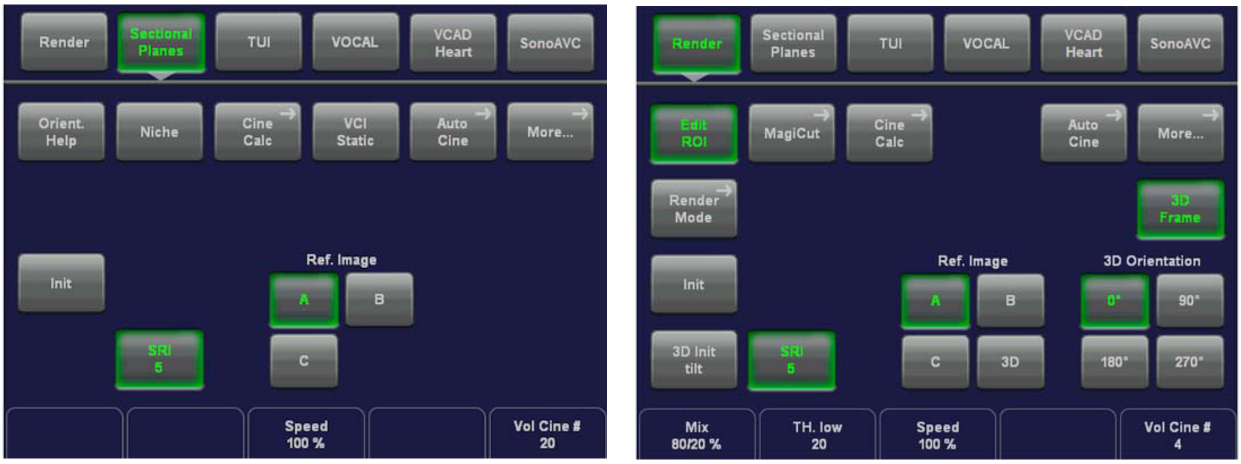
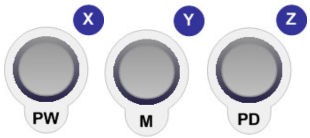


Figure 4-17 Sectional Planes and Image Rendering

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	ORIENT. HELP	Display of orientation help image figure.
5	VCI STATIC	The data looks like Static 3D - Sectional Planes. However, the 3 planes are VCI renderings (tissue information of a thick slice), computed from the 3D data set.
6	REF. IMAGE	To select the Reference image among A, B, C or 3D.
7	INIT	Resets rotations and translations of a volume section to the initial (start) position.
8	3D INIT	Resets the 3D image to the initial (start) position.
9	3D FRAME	Display of colored frame around 3D image and sectional planes for orientation.
10	3D ORIENTATION	To change the image orientation of the 3D image.
11	**ZOOM**	The 3D image as well as the sectional planes can be varied by their aspect ratio.
12	**MIX**	To adjust the mix ratio between two calculated modes.
13	**TH. LOW**	All color values below the level will be disregarded for calculation of the surface.
14	MAGI CUT	Ability to electronically manipulate the images and cut way “3D artifacts”.
15	RENDER MODE	To select the Render Mode (Image Type and Render Algorithm)
16	RESET CURVE	Reset the curvature of render start to default position.

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

Figure 4-18 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	SRI	Speckle Reduction Imaging (SRI) can be activated in all 3D/4D modes (except Full size display) to reduce speckle which interferes with the sectional planes (A, B and C). **Note:** The rendered 3D image is not affect.
7	3D BRIGHT.	Adjusts the brightness of the rendered 3D image. Note: This key is not available in Static 3D Sectional Planes mode.
8	**3D CONTRAST**	Adjusts the contrast of the rendered 3D image. Note: This key is not available in Static 3D Sectional Planes mode.
9	**BACKGROUND**	Adjusts the contrast of the screen background from dark to bright. Note: This key is not available in Static 3D Sectional Planes mode.
10	**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.
11	**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® E8 Basic User Manual, Chapter 11.

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 Auto Cine mode.

4-4-7-3 Activating 2D Auto Cine

1.) After Freeze touch the 2D CINE key on the Touch Panel.
2.) Select the **START IMAGE** of the sequence.The selected image is simultaneously displayed.
3.) Turn the **END IMAGE** 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 touch 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 touch the 3D ROT. CINE key on the Touch Panel.
2.) Select the Rotation angle with the touch keys or select it manually with the **START IMAGE** and **END IMAGE** rotary controls.
3.) Select the Step angle and the Rotation axis.
4.) Touch the CALCULATE CINE SEQUENCE key to start the calculation.
5.) To start/stop the 3D Rotation Cine sequence touch 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® E8 Basic User Manual, Chapter 11.6.

4-4-7-7 Activating Auto Cine

1.) After Real Time 4D acquisition touch the AUTO CINE key on the Touch Panel.
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 touch 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 touch the CINE CALC key on the Touch Panel.
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.) Touch the CALCULATE CINE SEQUENCE key to start the calculation.
6.) To start/stop the calculated Cine sequence touch START/STOP.

BT Version: The CINE CALC feature is only available at Voluson® E8 systems with BT08 software.

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® E8 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, touch CANCEL on the Touch Panel.
- To delete all measurement results of the selected "Study" from the monitor as well as from the corresponding Worksheet, touch the CLEAR STUDY key on the Touch Panel.
- 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 touch the EXIT key on the Touch Panel, 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 touch GENERIC DIST. on the Touch Panel.
2.) Touch the appropriate item on the Touch Panel. 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, touch the DELETE key on the Touch Panel, press the **CLEAR ALL** key on the control panel or the **DELETE MEAS.** key 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, touch 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 touch GENERIC AREA on the Touch Panel.
2.) Touch the corresponding item on the Touch Panel. 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, touch DELETE once. The original caliper is displayed to restart the measurement.
- To exit the measurement function without completing the measurement, touch EXIT on the Touch Panel, 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 touch GENERIC VOLUME on the Touch Panel.
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 4-25 and Section 4-4-8-2 on page 4-26.

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 touch MULTIPLANE on the Touch Panel.
3.) Select the first section through the body by rotating the **REF.SLICE** digipot below the Touch Panel 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: *The contour of the measured area is not erased if a new section is adjusted. To call back the measured areas touch the PREV. respectively the NEXT key on the Touch Panel.*

NOTE: *To erase the results, touch the INIT key on the Touch 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.) Touch AUTO TRACE on the Touch Panel. 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.) Touch MANUAL TRACE on the Touch Panel. 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.) Touch HR on the Touch Panel. 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 below the Touch 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® E8 Basic User Manual, Chapter 13

4-4-9 Calculations

The Voluson® E8 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
- Orthopedics 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® E8 Basic User Manual, Chapter 14

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, touch CANCEL on the Touch Panel.
- To delete the results of the last measured item, touch DELETE LAST on the Touch Panel.
- To delete all measurement results of the selected “Study” from the monitor as well as from the corresponding Worksheet, touch the CLEAR STUDY key on the Touch Panel.
- 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 touch the EXIT key on the Touch Panel, 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.) Turn the connector locking handle counterclockwise.
5.) Align the connector with the probe port and carefully push into place.
6.) Turn the connector locking handle clockwise to secure the probe connector.
7.) Open the side door, lay the cable into the intended cable holders and close the door.
So it is free to move, but not resting on the floor.

4-4-10-2 Activating the probe

1.) Press the **PROBE** key to activate the "Probe Select" menu.
2.) Select the appropriate probe by touching the corresponding key.
3.) Upon selection of an "Application", the programmed user presets appear.
4.) Touching a "Setting" key causes loading of the preset.

The probe is initialized, the Touch Panel 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® E8 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.) Open the side door, remove the cable from the cable holder and close the door.
2.) Turn the probe locking handle counterclockwise. 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® E8 provides an Patient/Image Management System that allows fast and extremely easy patient, exam and image management.

Figure 4-19 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 DATA TRANSFER 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 15 in the Basic User Manual of Voluson® E8.*

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 4-42.*

4-4-12 Erasing DVD/CD

1.) Press the UTILITIES key on the control panel.
2.) In the “Utilities” menu touch 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.

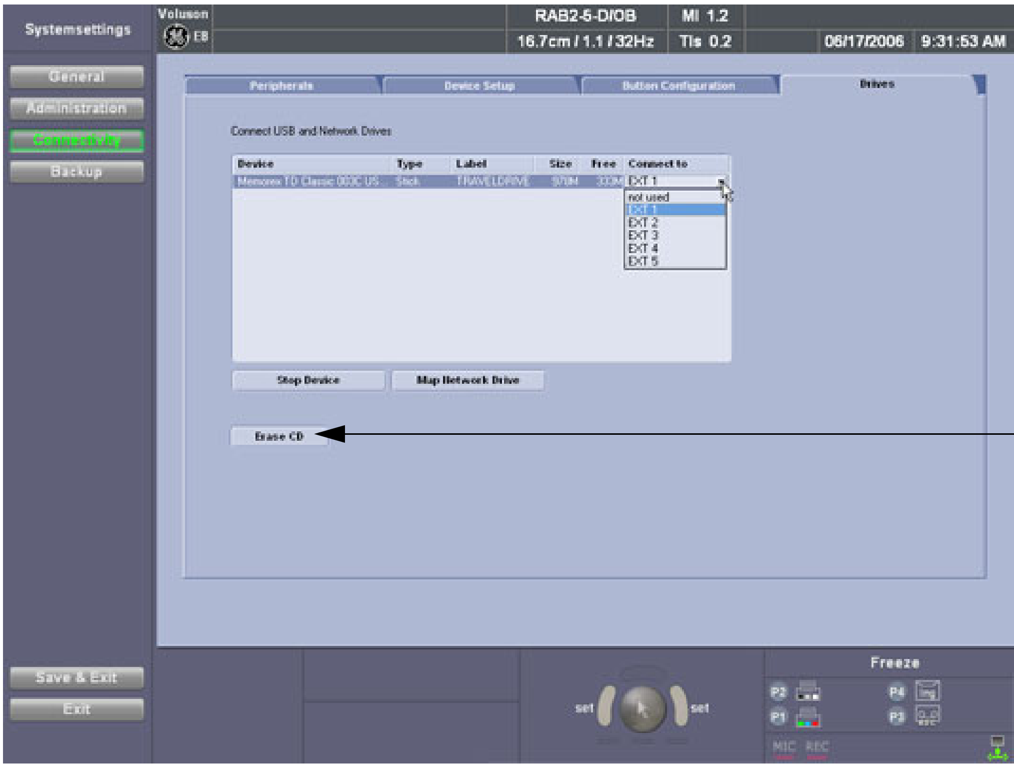


Figure 4-20 System Setup - Connectivity - DRIVES page

4.) Click the ERASE CD button to displays the “Erase DVD/CD” window as shown in Figure 4-21.
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, the complete erase mode is not possible.

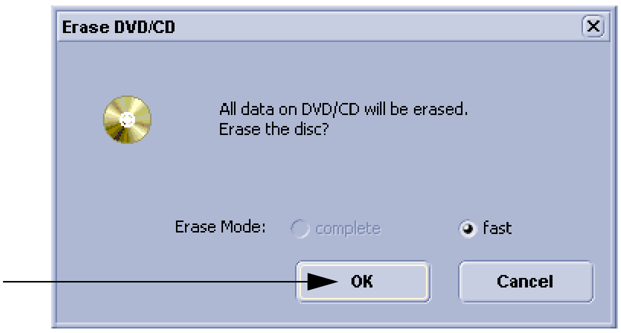


Figure 4-21 Erase DVD/CD Window

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 4-37) and the **Image Archive** (Section 4-5-6 on page 4-42) **once a week.**

1.) Press the **UTILITIES** key on the control panel.
2.) In the “Utilities” menu touch 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.

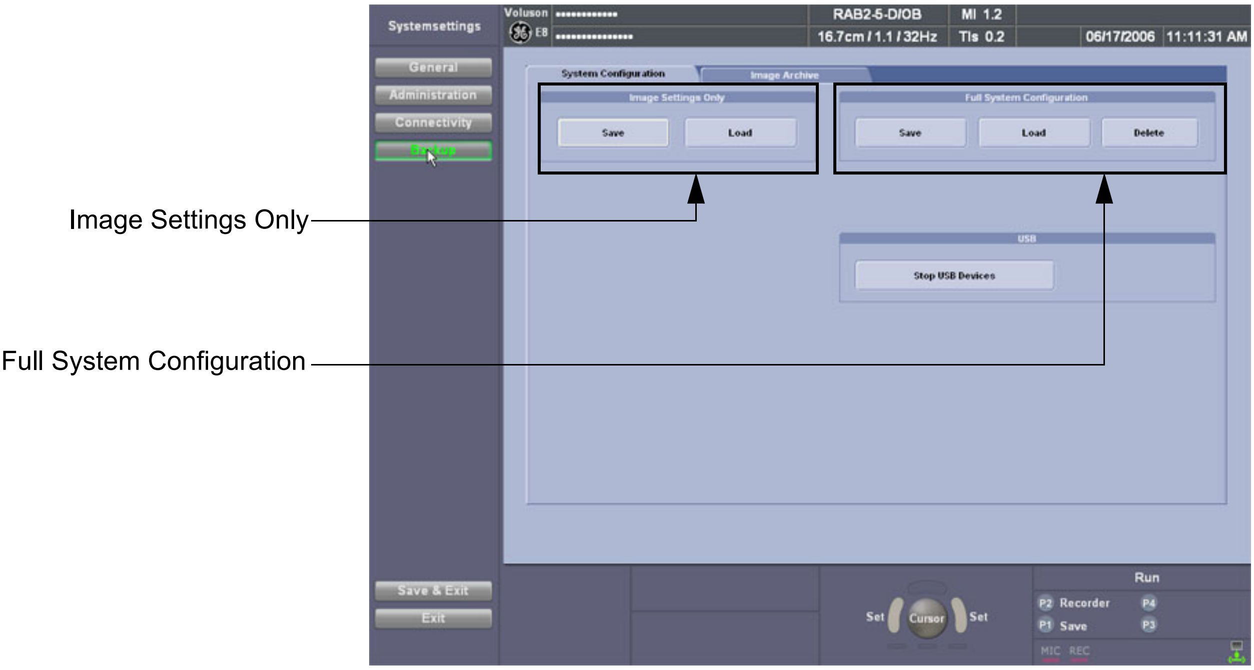


Figure 4-22 System Setup - Backup - SYSTEM CONFIGURATION page

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

A.) Image Settings Only

- Section 4-5-1 "Save Image Settings Only" on page 4-33
- Section 4-5-2 "Load Image Settings Only" on page 4-34

B.) Full System Configuration

- Section 4-5-3 "Save Full System Configuration (Full Backup)" on page 4-37
- Section 4-5-4 "Load Full System Configuration (Full Backup)" on page 4-39
- Section 4-5-5 "Delete Full System Configuration (Full Backup)" on page 4-41

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 3-88
- Any other drive connected to the system (e.g.; USB-Stick)
  Note: This function is only available in the Full Backup utility.
  For further details review: Section 3-5-14 on page 3-46

4-5-1 Save Image Settings Only

The Image Settings contains:

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

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 touch 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 “Image Settings Only” group.

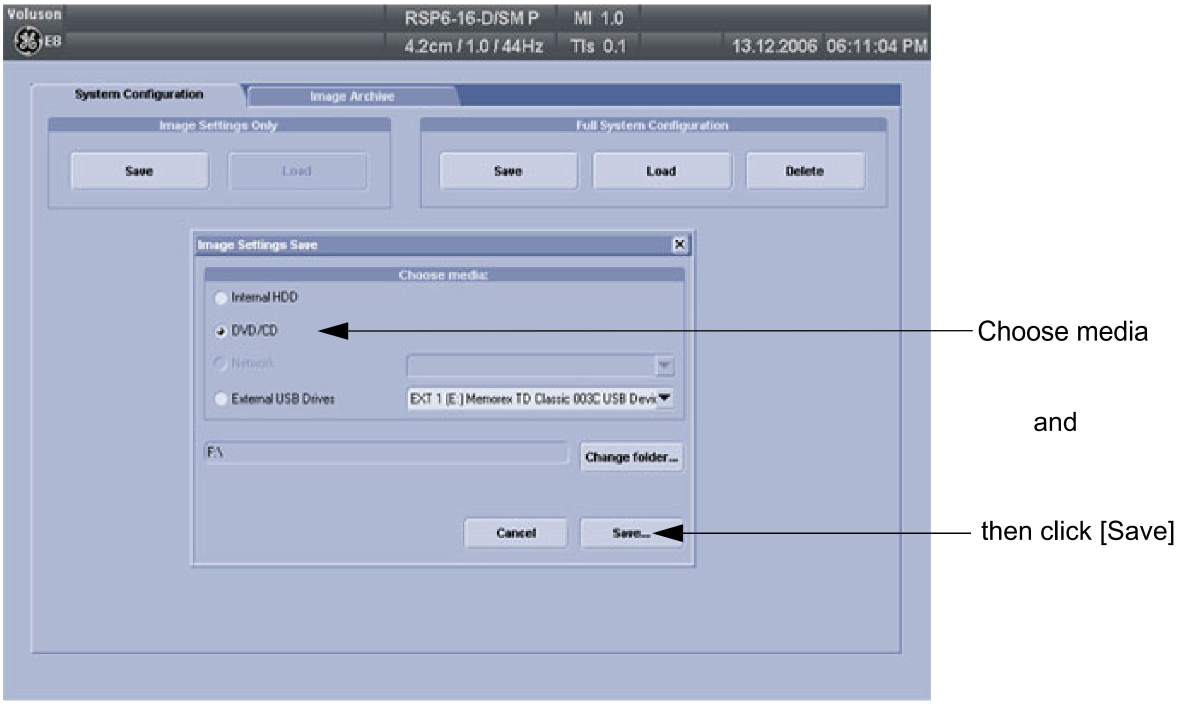


Figure 4-23 Image Settings Only - Save window

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 DVD/CD.
Additionally you can load the image settings from D:\usersettings\FactoryDefault\V830

4-5-2-1 Preparations

1.) Insert a DVD/CD+R/RW into the drive.
2.) Press the **UTILITIES** key on the control panel.
3.) Touch 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 "Image Settings Only" group.

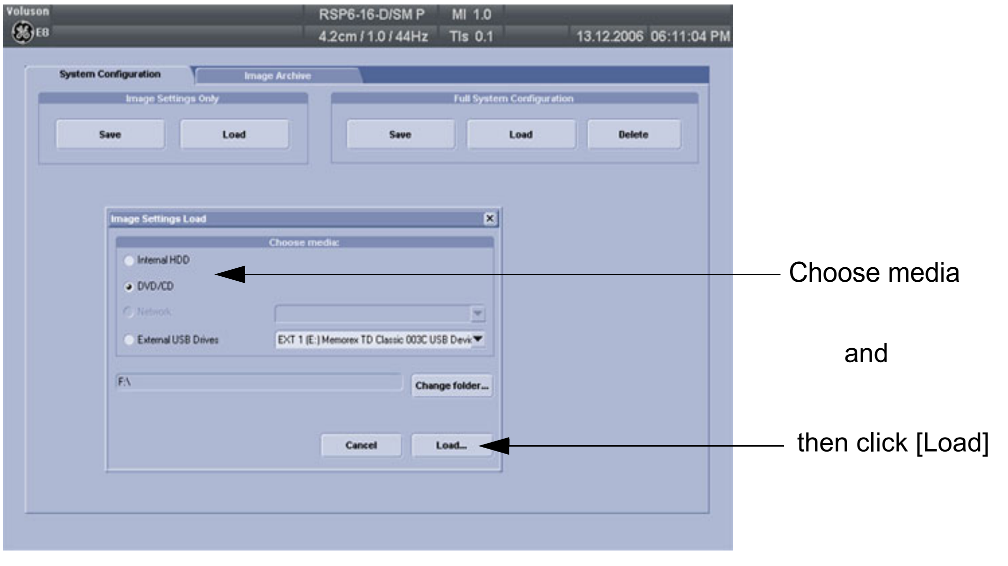


Figure 4-24 Image Settings Only - Load window

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\V830" and then click the LOAD button.*

Two Image Settings are available which slightly differ:

- **General** = for rest of the world
- **USA** = for United States (e.g., image orientation UP/DOWN inverted at transvaginal probes)

7.) Select the appropriate file and click OK.
8.) Select the desired loading procedure:
- Load "Complete Backup" on page 4-35
- Load only parts of the "Complete Backup" on page 4-36

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 Preparations on page 4-34.

2.) Select the **"Complete Backup"** (marked blue; see: Figure 4-25 below) and click the >> button to copy the Complete Backup into the Load Data field.

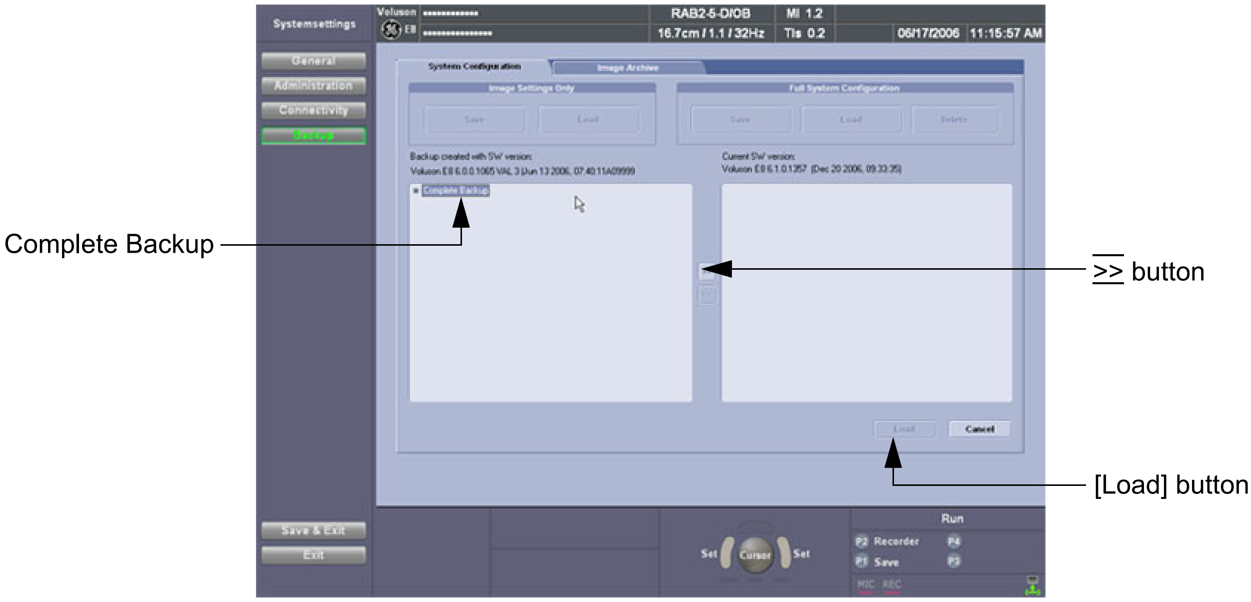


Figure 4-25 Load Backup Data

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 is required, if the user prefers to keep his "old" setting, 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.)

NOTICE Whenever a system is upgraded or new presets are loaded, **it is essential to load (at least!) the proper Application Settings (image presets)**, adapted for the used system software version. (Tune version has to match Application software version!)

Please note: When reloading these Application Settings, any existing User Programs, 3D/4D Programs and Auto Text **remain unaffected**!

For more details refer to the troubleshooting section: Adverse affects on image quality (after upgrade or preset load) on page 7-26.

1.) Perform Preparations on page 4-34.
2.) Click the + sign (next to "Complete Backup") to open the content tree.
3.) Select "ApplicationSettings" and copy the content by clicking the >> button.

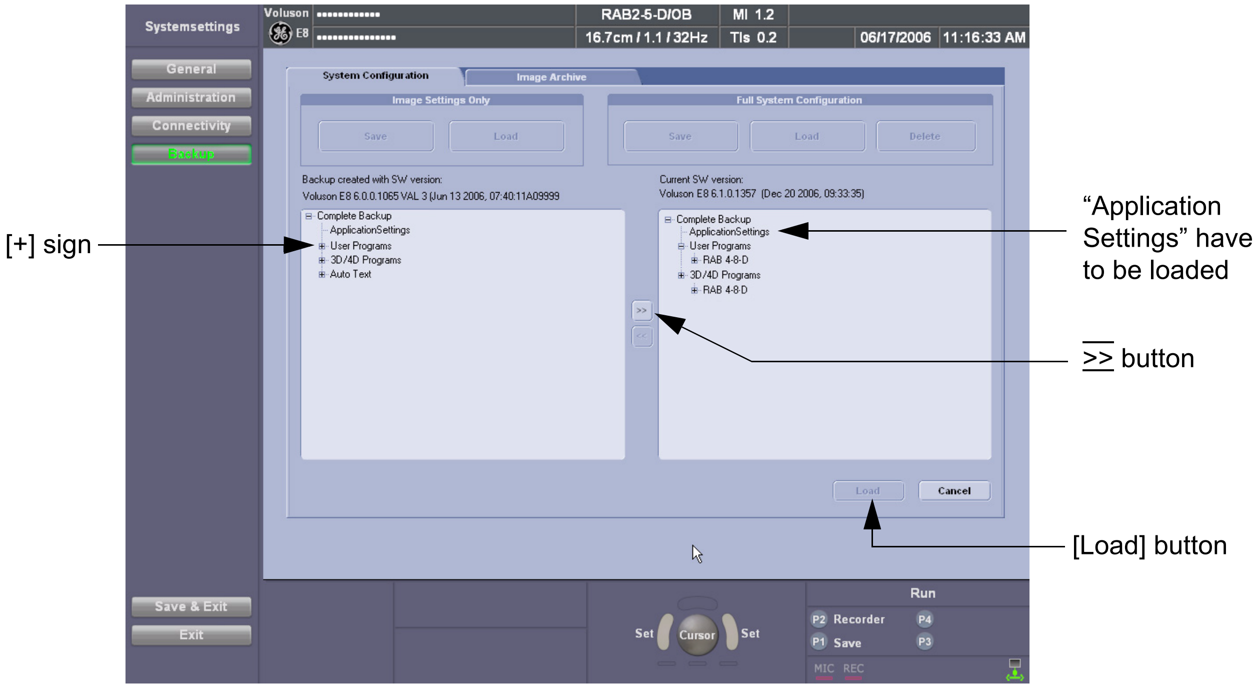


Figure 4-26 Load image settings for probe (e.g., RAB4-8-D)

4.) If desired, click the + sign next to "UserPrograms", select the probe(s) and copy the content by clicking the >> button.
5.) If desired, click the + sign next to "3D/4D Programs", select the 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.

6.) 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 gray curves and the user settings)
- Measure Configuration (user specific measure setup settings)
- Patient Archive (database containing patient demographic data and measurements) - **no images**
- V830 Settings (general settings such as language, time/date format and the enabled options)
- 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 touch 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.

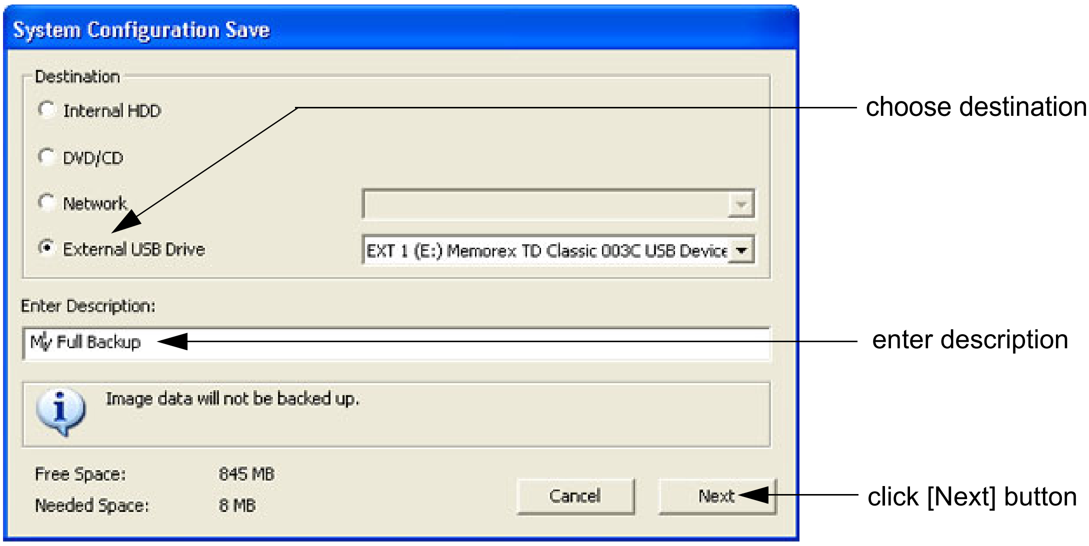


Figure 4-27 System Configuration Save

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 4-42.

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

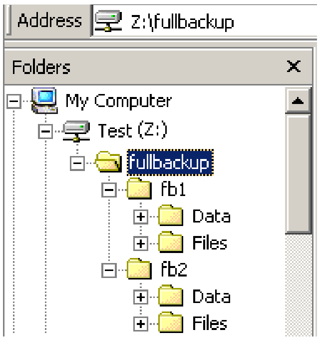
After copying the data, the Voluson® E8 reboots and the application starts again.

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 3-88), 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:

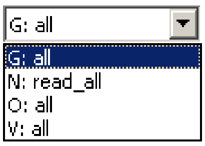


The sub folders have the names *fb**X*** where ***X*** is a number (e.g., Z:\fullbackup\fb1).

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

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

Figure 4-28 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 4-29 "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 4-30).

Figure 4-30 Please stop USB Devices before unplugging!

For further details review: Section 3-5-14 on page 3-46.

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 4-37.***
The "Full Backup" loading procedure replaces (overwrites) ALL the existing data on the local hard drive of the Voluson® E8 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!

NOTICE After "Full Backup" loading procedure, **it is essential to load (at least!) the proper Application Settings (image presets)**, adapted for the used system software version.
Refer to Section 4-5-2 "Load Image Settings Only" on page 4-34.

Please note: When reloading these Application Settings, any previous modifications done by the user to his user settings (sub menu parameters, naming, …) will **NOT be affected!**

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® E8 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 (6.x.x -> 7.x.x), the following items will not be restored:

   A.) V830 Settings
   B.) Options
   C.) 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 **only** allowed to restore data onto the same system if and only if the software version on this system is equal or higher than the version in the backup.

6.) 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 touch 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.

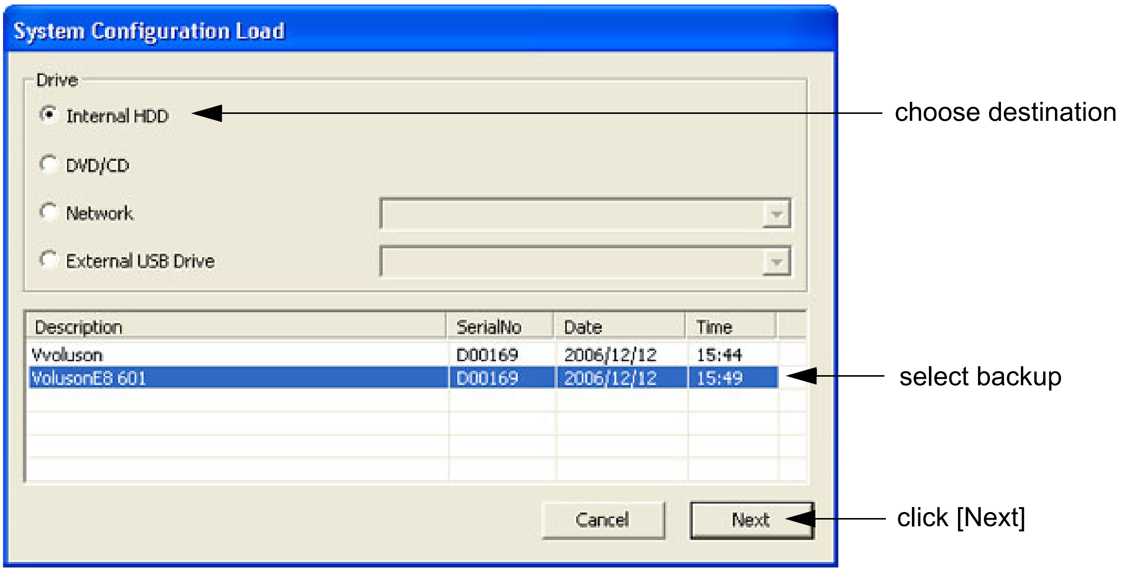


Figure 4-31 System Configuration Load

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.

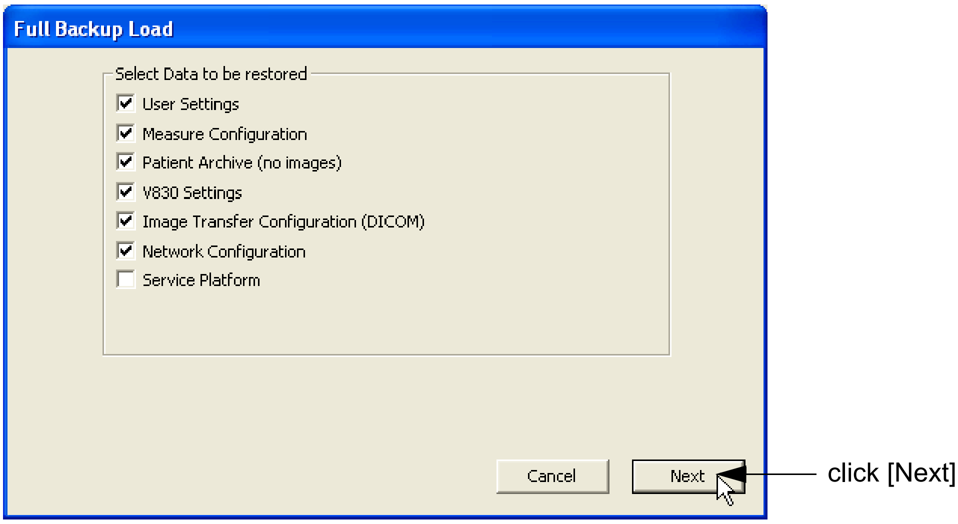


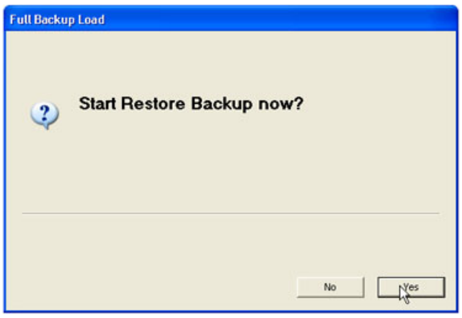
Figure 4-32 Select Data to be restored

8.) Select the data to be restored to the Voluson® E8 system.

NOTE: *For description of the check box names refer to:*
A backup of the Full System Configuration always contains the following data on page 4-37.

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 4-33 Start Restore Backup now?

After restoring the data, the Voluson® E8 reboots and the application starts again.

10.)Load proper Application Settings as described in Section 4-5-2 on page 4-34.

11.)Confirm that the date and time are set correctly and that the Windows automatic DST feature is offRefer to Section 7-8-8-3 "Daylight Saving Time (DST) - New Dates" on page 7-28.

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

1.) Press the **UTILITIES** key on the control panel.
2.) In the "Utilities" menu touch 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.

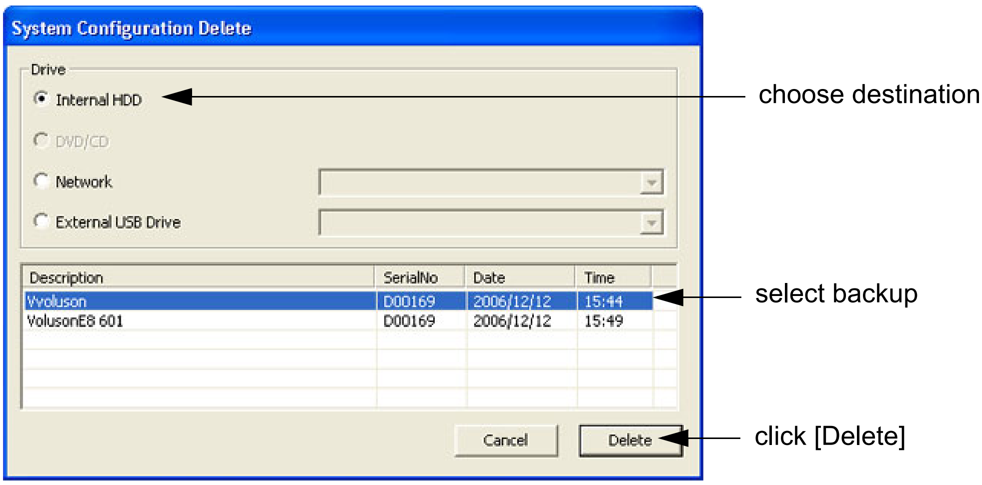


Figure 4-34 System Configuration Delete

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 4-42) and **Backup the Full System Configuration** (Section 4-5-3 on page 4-37) **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 touch 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.

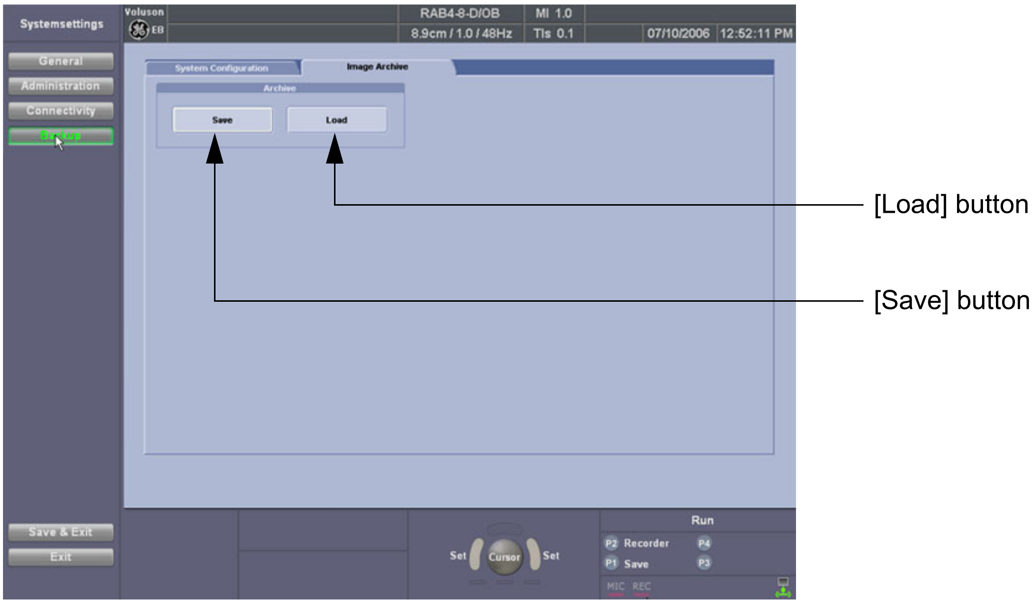


Figure 4-35 System Setup - Backup - IMAGE ARCHIVE page

4.) Click the SAVE button.

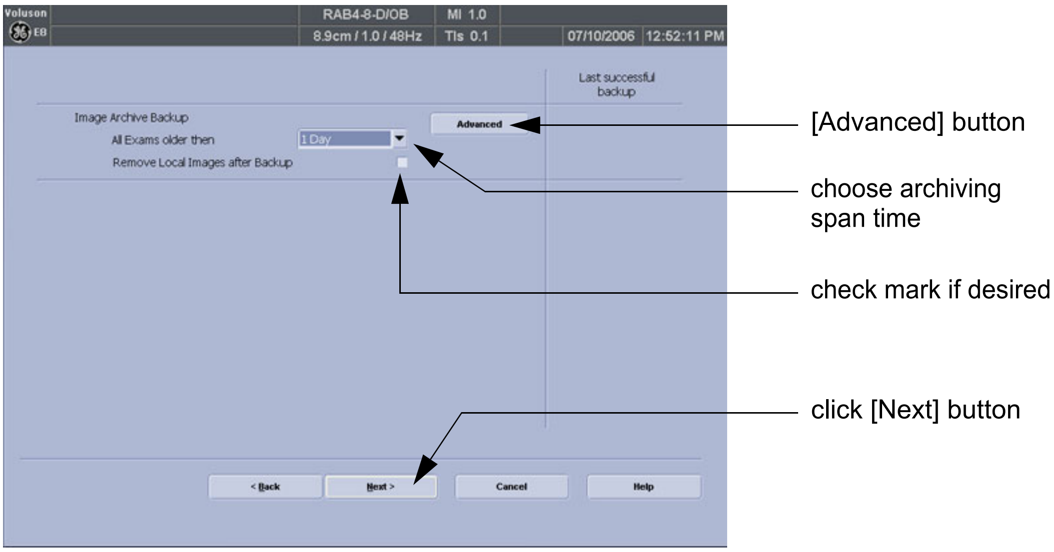


Figure 4-36 Image Archive Save - preparations

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 4-36 on page 4-42), 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.

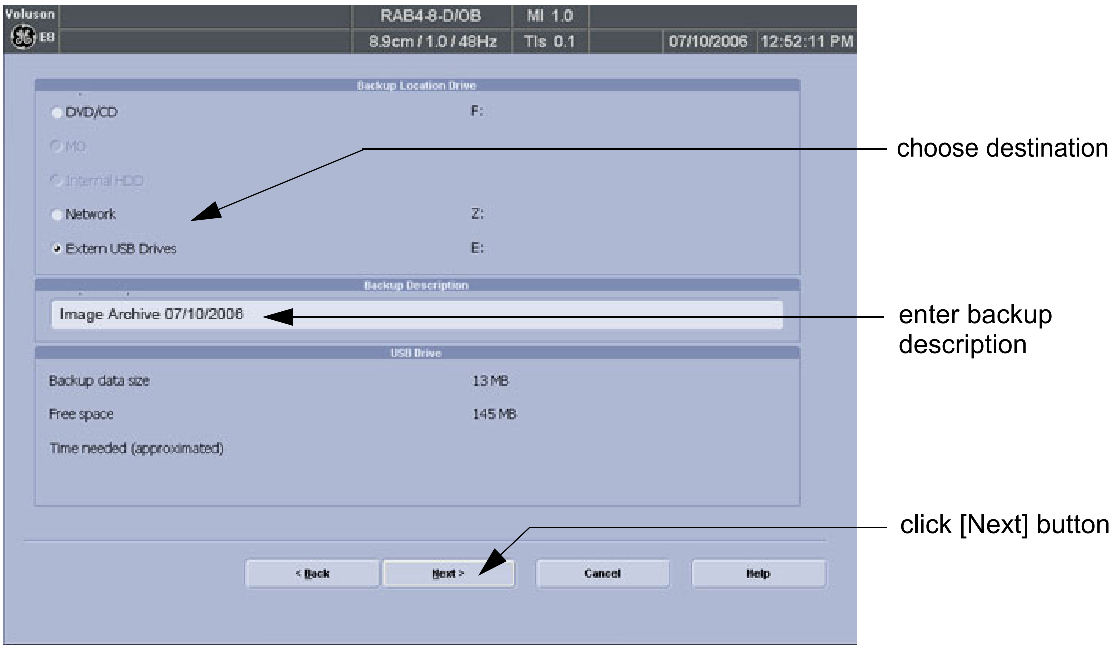


Figure 4-37 Image Archive Save - choose destination

9.) Choose the Destination.

10.) Enter the description of the image backup.

CAUTION **Voluson® E8 presets, configurations and image settings will not be backed up! To Backup the Full System Configuration refer to Section 4-5-3 on page 4-37.**

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 touch 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 4-35 on page 4-42).

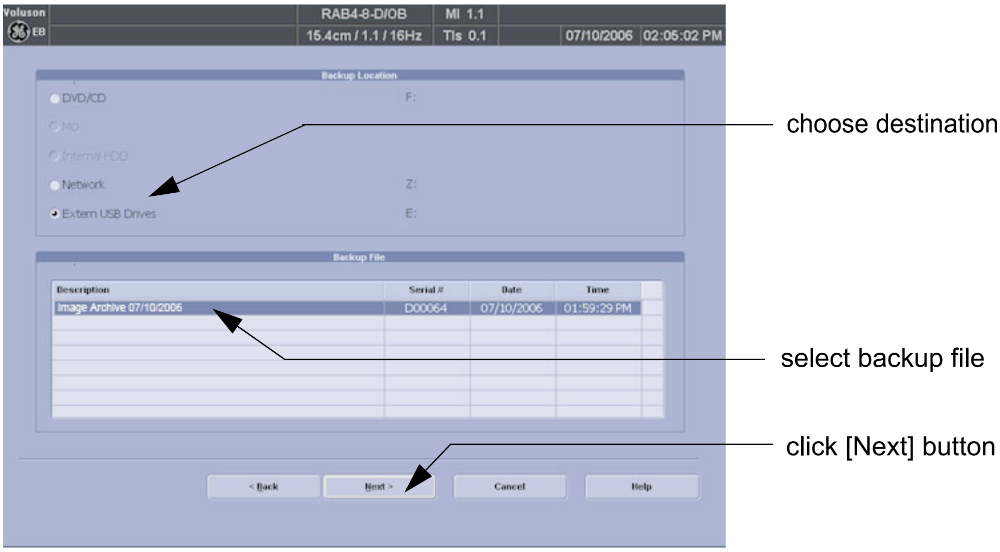


Figure 4-38 Image Archive Load - choose destination

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.

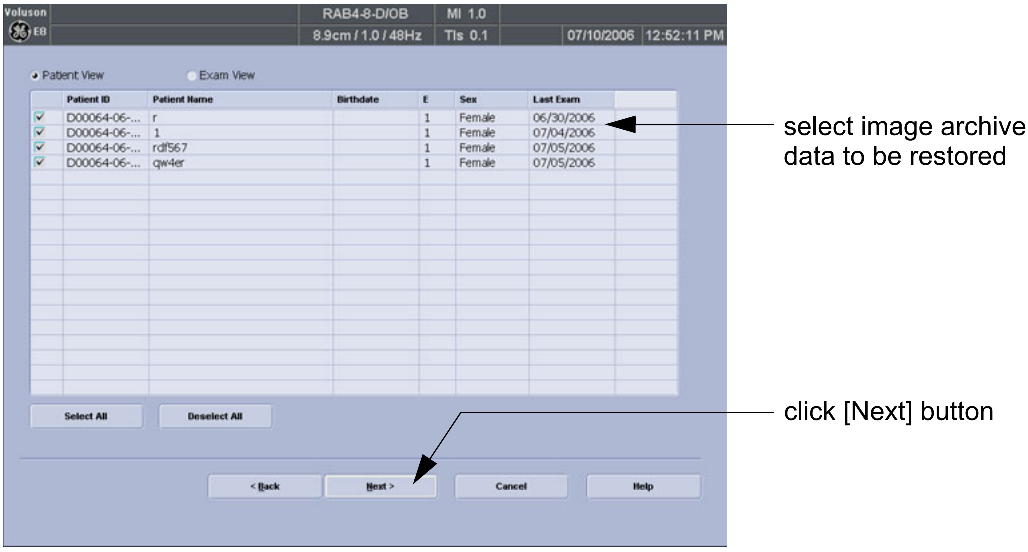


Figure 4-39 select image archive data to be restored

8.) Select (check mark) the image archive data to be restored to the Voluson® E8 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 touch 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

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 the Video Norm standard as described in Section 3-8-1-6 on page 3-69	settings assigned as required for the country
2	Peripherals: Check assignment of Report Printer	printer assigned as desired by the customer
3	Peripherals: Check assignment of Foot Switch	Footswitch left/right are assigned as desired by the customer
4	Device Setup: Check DICOM, Network and Archive configuration	setting assigned as desired and required by the customer
5	Button Configuration: Check assignment of remote keys **P1**, **P2**, **P3** and **P4**.	Remote keys are assigned as desired by the customer
6	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 touch 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® E8.

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 ECG Check Out

Connect the ECG preamplifier MAN and check:

Table 4-15 ECG preamplifier Check

Step	Task	Expected Result(s)
1	Press the **UTILITIES** key on the control panel and then touch the ECG button to display the “ECG” menu.	It will display a curve along the bottom edge of the image sector.

Section 4-8
Mechanical Function Checks

4-8-1 Control Console Positioning

The control console can be rotated, translated and adjusted in height (**electronically** only).

NOTE: For further details refer to Section 5-11-3 on page 5-57 and/or Section 6-5 on page 6-8.

4-8-2 Brakes and Direction (Swivel) Locks

Check the brakes and swivel locks function as described below.

Table 4-16 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 4-9
Site Log

Table 4-17 Voluson® E8 - 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® E8's system concepts, component arrangement, and subsystem function. It also describes the Power Distribution System (PDS) and probes.

Table 5-1 Contents in Chapter 5

Section 5-2
General Information

Voluson® E8 is a digital beamforming curved-, linear- and phased array ultrasound imaging system.
It has provisions for analog input sources like ECG and Phono.
A CW-Doppler probe may also be connected and used.

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® E8 Major Components

Section 5-2 General Information (cont'd)

Among other significant features of the Voluson® E8 ultrasound system are the following:

- Integrated FrontEnd (uses advanced ASIC and FGPA technologies)
- Open connectivity using USB ports
- Bluetooth - wireless connectivity
- high performance 15"/19" LCD monitor
- Low profile, backlit Keyboard

Voluson® E8 has a digital beam forming system (incorporated in the FrontEnd) which can handle up to 256 element probes by use of multiplexing.

Signal flow from the Probe Connector Panel, to the FrontEnd (FE) Electronics, to the BackEnd Processor (BEP), and finally is displayed on the LCD monitor and peripherals.

Voluson® E8 internal electronics are divided into three:

- Front End (FE) Processor
- Back End Processor (BEP)
- 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: Section 5-4 on page 5-28
- Top Console User interface (System I/O with hard keys, Touch Panel and EL-Display): Section 5-6 on page 5-41
- Monitor: Section 5-7 on page 5-50
- External I/O: Section 5-8 on page 5-51
- Peripherals: Section 5-9 on page 5-52
- RTN: Primary Power supply and Isolation transformer for the peripherals Section 5-10 on page 5-54
- System mechanical chassis: trolley to keep all major components Section 5-11 on page 5-56

Section 5-2 General Information (cont'd)

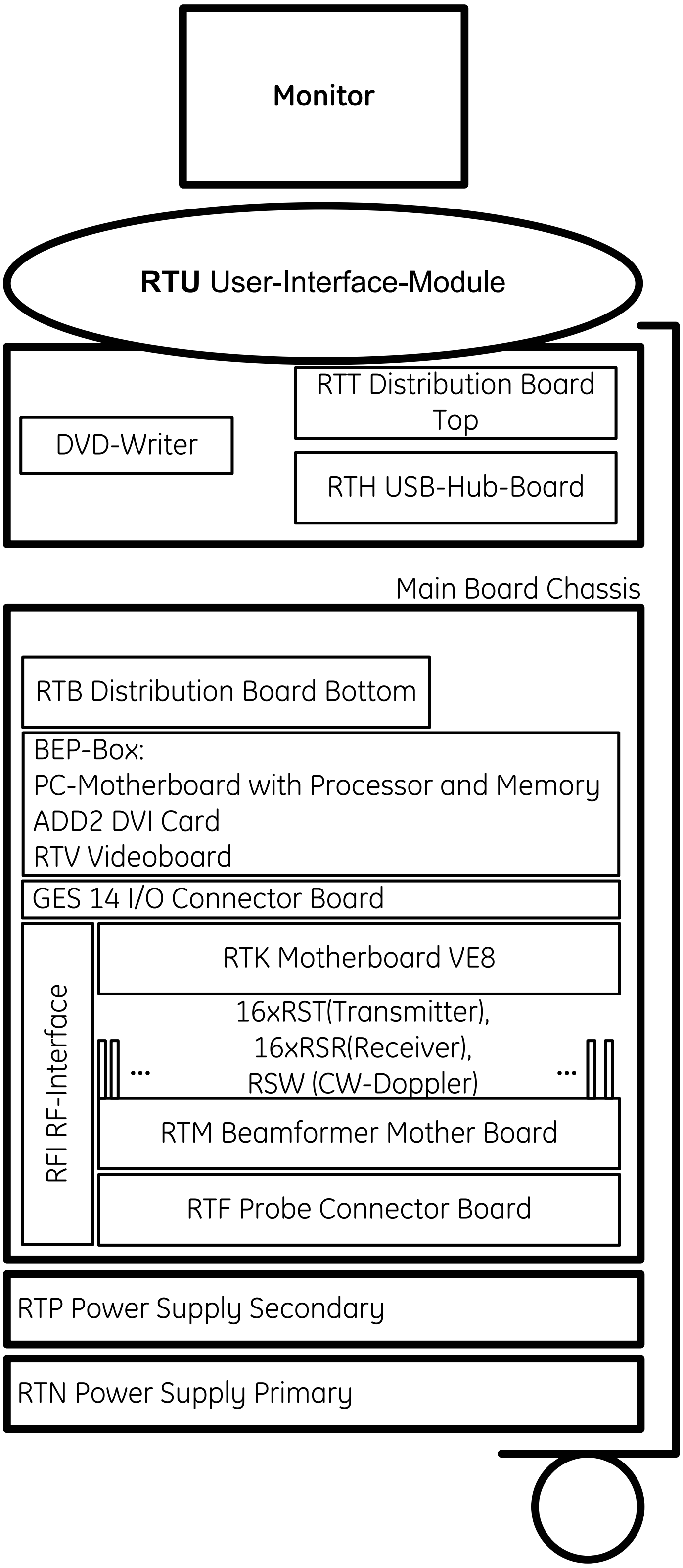


Figure 5-2 Basic Block diagram of Voluson® E8

Section 5-2 General Information (cont'd)

The Voluson® E8 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. Voluson® E8 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)
- Orthopedics (ORTHO)

The Voluson® E8 supports a variety of linear-, curved-, phased array and pencil probes for various clinical applications. Any 3 probes may be connected at the same time (+ 1 pencil CW-probe).

Medical application fields include:

- Obstetrics
- Gynecology and Fertility
- Radiology
- Internal Medicine
- Neurology
- Cardiology
- Oncology
- Urology
- Orthopedics
- Pediatrics

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® E8 Basic User Manual.

5-2-1 Description of Voluson® E8 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 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® E8´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.

5-2-1-1-2 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.

5-2-1-1-3 B-Flow (optional)

For details review: Section 5-2-4-5 "B-Flow" on page 5-16

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

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, the other being CW Doppler. 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® E8 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® E8 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.

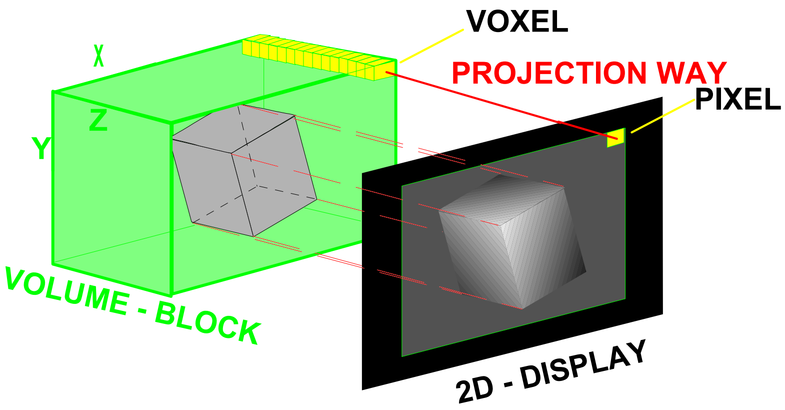


Figure 5-3 Principle: Volume Rendering

5-2-2 Block diagram Voluson® E8

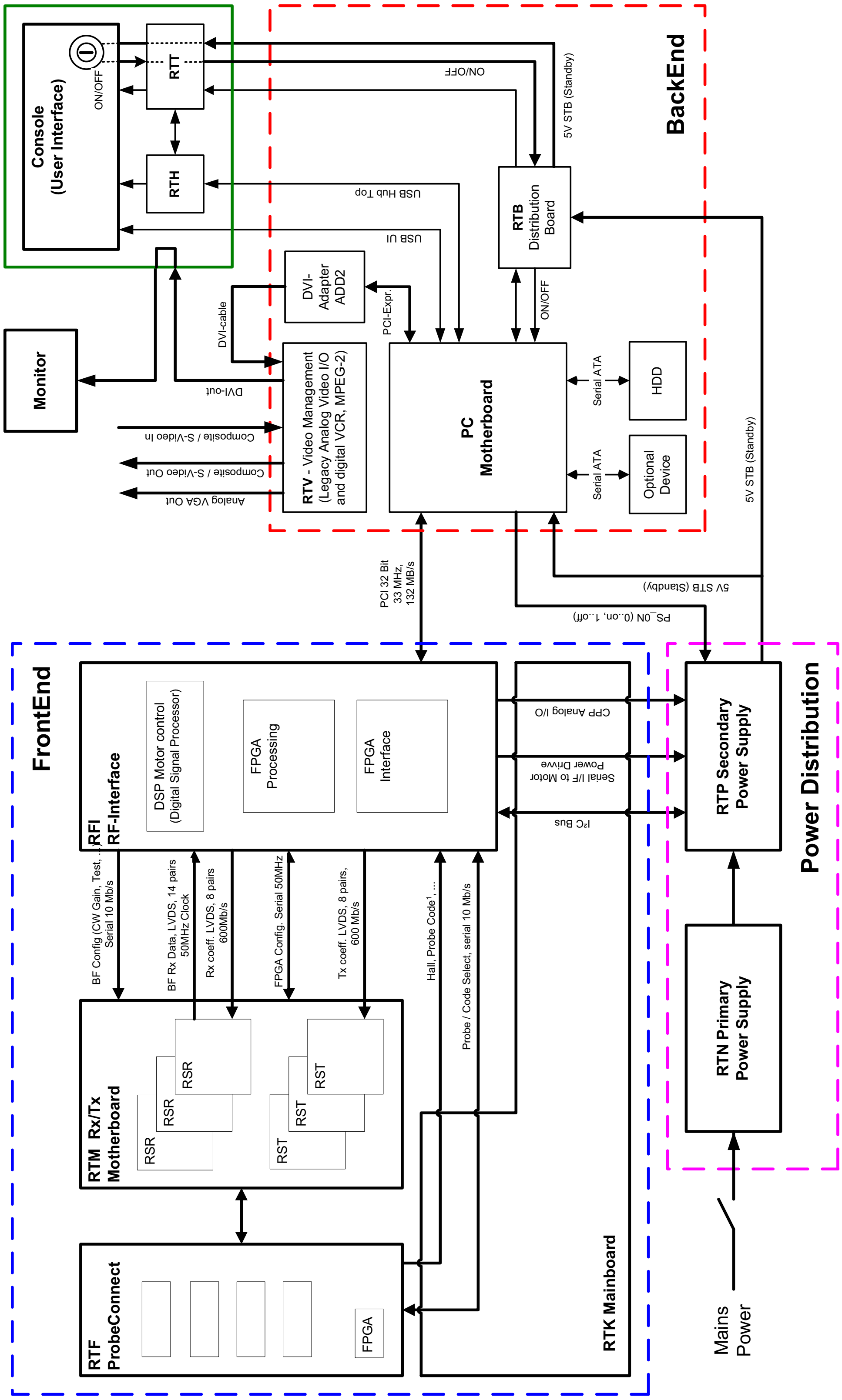


Figure 5-4 Voluson® E8 - Block diagram

5-2-3 Data Flow Control Description

This section describes the functions of the Voluson® E8 Boards vs different Operation Modes.

- RTM - Beamformer Motherboard
- RFI - Mid-Processor, System Control and DMA Controller
- RTV - Video Management Board

5-2-3-1 B-Mode

1.) RFI

The RFI contains the Clock-Management and PRF-Generator.
It generates(drives) BF(=Beamformer)-ASIC-Clock (200MHz) and Shot-Trigger for the RTM.
Configures RTF (Probe Connector board) and Beamformer (RSR and RST Subboards on RTM) with TX-Frequ, TX-Focus, RX-Focus, LineNo (lateral Position), TX- Apodisation, RX-Apodisation, Multibeam, etc. The RFI 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 RFI 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.) RTM

Contains 16 RSR (Receiver) and 16 RST (Transmitter) Beamformer Subboards.
This Beamformer Subboards consist of Beamformer-ASIC, TX-Amplifier, RX-TGC-Amplifier, Signal-ADC. Each RST can support 16TX-Channels, each RSR can support 16RX-Channels.

- TX-Channel: ASIC generates TX-Freq through dividing 200MHz by 2,3,4,5,... and TX-Focus.
- RX-Channel: ASIC generates Sample-Clocks for the ADC, manages RX-Focus (Delay and Chain-Adder) and Apodization.

3.) RTV - Video section

Video Information is provided by the PC on the DVI (Digital Visual Interface) output connector. The signal is connected to RTV, where the analog VGA signals for the monitor and standard video timing outputs are generated.

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 RFI.
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 RFI.
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.) RFI
see: 5-2-3-1 B-Mode

a.) DMA section
B-mode-Data from RFI is written via SP0 into SDRAM Fifo Buffer memory. DMA Controller 1 transfers the data into PC 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 PC main memory.
CineMode with ECG: CineMode-Memory for the ECG-Curve is inside PC-Memory.
Software has to take care that M-Mode-Image and ECG-Curve are placed exactly one upon the other, means: have the same Cine-Shift.

2.) RTM
see: 5-2-3-1 B-Mode

3.) RTV - Video section
see: 5-2-3-1 B-Mode

5-2-3-3 D-Mode (Pulsed Wave- and Continuous Wave Doppler)

1.) RFI

- PRF-generator; see: 5-2-3-1 B-Mode
- 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 from RFI 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 PC main memory.
CineMode with ECG: CineMode-Memory for the ECG-Curve is inside PC-Memory.
Software has to take care that D-Mode-Image and ECG-Curve are placed exactly one upon the other, means: have the same Cine-Shift.

2.) RTV - Video section

see: 5-2-3-1 B-Mode

5-2-3-4 D-Mode Autotrace (draws PC-calculated envelope to D-Spectrum) (ECG-Curve is similar to Autotrace-Curve)

1.) RFI

- PRF-generator; see: 5-2-3-1 B-Mode
- 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.
- D-Mode Data use the dedicated 16-bit Bus SP0 to the RTV.

a.) DMA section

D-mode-Data from RFI is written via SP0 into SDRAM Fifo Buffer memory.
PC calculates Autotrace-Curve from D-Mode data.
Cine Mode with Autotrace/ECG: Cine Mode-Memory for the Autotrace/ECG-Curve is inside PC-Memory.
Software has to take care that D-Spectrum and Autotrace/ECG-Curve are placed exactly one upon the other, means: have the same Cine-Shift.

2.) RTV - Video section

see: 5-2-3-1 B-Mode

5-2-3-5 CFM-Mode (Color Flow Mode)

1.) RFI

- PRF-generator; see: 5-2-3-1 B-Mode
- 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.

2.) RTV - Video section

see: 5-2-3-1 B-Mode

5-2-3-6 3D-Mode (Freezes after 1 volume sweep)

see: 5-2-3-1 B-Mode

5-2-3-7 Real Time 4D-Mode (nonstop volume rendering)

see: 5-2-3-1 B-Mode

5-2-3-8 XBeam CRI-Mode (CrossBeam Compound Resolution Imaging)

see: 5-2-3-1 B-Mode

5-2-3-9 VCI-Mode (Volume Contrast Imaging)

see: 5-2-3-1 B-Mode

5-2-3-10 Extern-Video-Mode (display Video from Video-Recorder)

1.) RFI

Not used for Signal-Processing

2.) RTV - Video section

Analog input from an external video source (YC or CVBS) is converted to a digital RGB data stream by a video decoder. It is mixed with the DVI video output from PC in an overlay unit (Chroma keying mechanism). Generation of analog VGA signals for the monitor and standard video timing outputs follows this block.

5-2-3-11 Archive write mode (store Image to Archive)

1.) RFI

Not used

2.) RTV - Video section

Not used

5-2-4 Description of Software Options

To activate the software options:

1.) Press the **UTILITIES** key on the control panel.
2.) In the “Utilities” menu touch 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 and Application Packages

individual SW-Options	Description	Fetal Expert Package	General Obstetrics Package	OB/Gyn Package	Gyn Package	Breast Package	ARM Package
Real Time 4D	5-2-4-1 Real Time 4D	X	X	X	X	X	X
DICOM	5-2-4-2 DICOM	X	X	X	X	X	X
VOCAL II	5-2-4-3 VOCAL II - Virtual Organ Computer-aided Analysis			X	X	X	X
STIC	5-2-4-4 STIC (Spatio-Temporal Image Correlation)	X					
B-Flow	5-2-4-5 B-Flow	X			X	X	
VCI	5-2-4-6 VCI - Volume Contrast Imaging	X	X	X	X	X	X
Contrast	5-2-4-7 Coded Contrast Imaging						
TUI	5-2-4-8 T.U.I. - Tomographic Ultrasound Imaging	X	X	X	X	X	X
SonoVCAD Heart	5-2-4-9 SonoVCAD Heart- Computer Assisted Heart Diagnosis Package	X					
STIC Oncology	5-2-4-10 STIC Oncology (Spatio-Temporal Image Correlation f. Oncology)				X	X	
SonoAVC	5-2-4-11 SonoAVC- Sono Automated Volume Count						X
Expert	5-2-4-12 Expert (= Upgrade “Option“ Voluson® E8 -> Voluson® E8 Expert)						

NOTE: Additional options are not yet implemented.

BT Version: The options “STIC Oncology” and “SonoAVC” are only applicable at systems with BT08 software.

BT Version: Application Packages are only available for systems with BT08 software.

5-2-4-1 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 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.

5-2-4-3 VOCAL II - Virtual Organ Computer-aided Analysis

Diagnosis and therapy of cancer is one of the most important issues in medical care.
The VOCAL II - Imaging program allows completely new possibilities in cancer diagnosis, therapy planning and follow-up therapy control.

VOCAL II offers additional functions:

- Manual or Semi automatic Contour detection of structures (such as tumor lesion, cyst, prostate, etc.) and subsequent volume calculation.
  The accuracy of the process can be visually controlled by the examiner in multi-planar display.
- Construction of a virtual shell around the contour of the lesion. The wall thickness of the shell can be defined. The shell can be imagined as a layer of tissue around the lesion, where the tumor vascularization takes place.
- Automatic calculation of the vascularization within the shell by 3D color histogram by comparing the number of color voxels to the number of grayscale voxels.

5-2-4-4 STIC (Spatio-Temporal Image Correlation)

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.

5-2-4-5 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 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.

5-2-4-7 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 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.

5-2-4-9 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.

5-2-4-10 STIC Oncology (Spatio-Temporal Image Correlation f. Oncology)

<u>Clinical application and advantage:</u>

The STIC function, that is generally used to display high flow velocities at the heart, is now used to represent slow flow (tumor blood circulation) of vessels over the time.
One of the objectives is, to display ovarian tumors (which are frequently found in GYN applications), to observe them over the time and consequently visualize them in 4D and/or evaluate them via histogram.

<u>Function:</u>

Similar to STIC Cardio-acquisitions, a volume sweep is made of the lesion. Afterwards the computer displays the heart rate and vessels in multiplanar view and/or visualizes it in 4D.

BT Version: The option “STIC Oncology” is only applicable at systems with BT08 software.

5-2-4-11 SonoAVC- Sono Automated Volume Count

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. From the calculated volume an average diameter can be calculated. It also lists the objects according to their size.

“Separation” is controlling a parameter of the segmentation algorithm that defines an initial threshold to separate objects. Increasing this parameter will prevent objects from being identified as multiple objects (e.g. when there is noise within the object), but might prevent small objects from being found correctly.

“Growth” is controlling a parameter in the segmentation algorithm that defines the final shape of the objects found. Increasing this parameter will allow the objects to fit tighter to the visible boundary. A value too large might cause the objects to grow over the boundary and cover areas no longer part of the objects of interest.

BT Version: The option “SonoAVC” is only applicable at systems with BT08 software.

5-2-4-12 Expert (= Upgrade “Option“ Voluson® E8 -> Voluson® E8 Expert)

- enables the full functionality and performance of “standard” Voluson® E8 platform by providing the new feature “‘Wide Sector” (extending the field of view of curved array probes by the means of beam steering) on all probes capable of this feature
- secondly this function is needed to enable the function of the Matrix Volume Probes (RAM3-8 and RSM5-14) and the high resolution transvaginal probe RIC6-12

BT Version: This “Expert” ***Upgrade option*** is only applicable at systems with BT08 software.

5-2-5 Description of Hardware Options

Table 5-3 Hardware Options

	HW-Options	Description
1	CW-Doppler	5-2-5-1 CW - Continuous Wave Doppler
2	ECG Digital Module	5-2-5-2 ECG Preamplifier
3	WLAN Network Adapter	5-2-5-3 Wireless Network Adapter (WLAN - Wireless Local Area Network)
4	Scan/Freeze Footswitch	5-2-5-4 Scan/Freeze Footswitch

5-2-5-1 CW - Continuous Wave Doppler

CW Doppler mode provides real time spectral analysis of CW Doppler signals. This information describes the Doppler shifted signal from the moving reflectors in the CW Doppler beam. CW Doppler can be referenced through a small pencil probe or phased array scan head, but it can also be used in conjunction with a 2D image which has an M-line superimposed on the 2D image indicating the position of the Doppler sample volume. For through-the-beamformer CW, this beam is steerable by the operator, and is done by adjusting the location of the M-line. The CW Doppler beam, or M-mode line, can be steered allowing interrogation along an operator-selected line within the image.
This option can be upgraded by implementing the CW-Doppler board (RSW).

BT Version: The option CW-Doppler is only available at Voluson® E8 systems with BT08 software.

5-2-5-2 ECG Preamplifier

MAN6 (internal, digital version)

For details see: Section 5-9-4 "ECG-preamplifier (MAN6 - optional)" on page 5-52.

5-2-5-3 Wireless Network Adapter (WLAN - Wireless Local Area Network)

For details see: Section 5-9-5 "Wireless Network Adapter" on page 5-52.

5-2-5-4 Scan/Freeze Footswitch

For details see: Section 5-9-6 "Footswitch" on page 5-53.

5-2-6 Data Location

The Voluson® E8 has a 160 GB 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

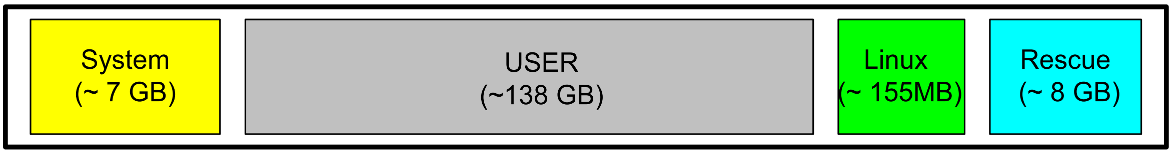


Figure 5-5 Data Location - distribution of partitions

Section 5-3
FrontEnd Processor

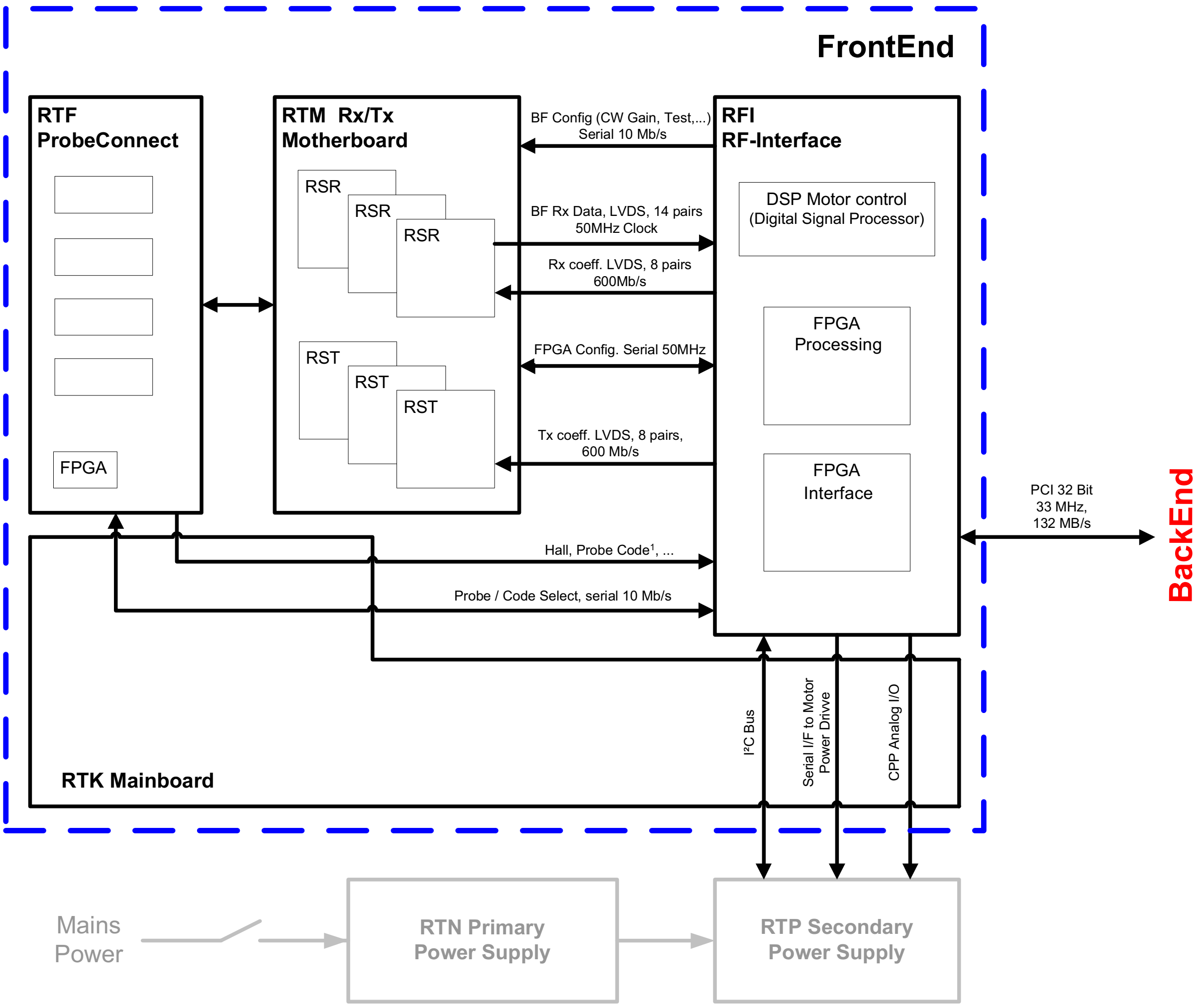


Figure 5-6 Front End Processor - Block diagram

Table 5-4 below outlines the Voluson® E8 Front End components described in the sub-sections.

Table 5-4 Voluson® E8 - Front End components

Sub-section	Description	Page Number
5-3-1	RTF- Probe Connector Board	5-22
5-3-2	RTM - Beamformer Motherboard	5-23
5-3-3	RSR- Beamformer Receiver Subboards	5-24
5-3-4	RST- Beamformer Transmitter Subboards	5-24
5-3-5	RSW - CW-Doppler Board (optional)	5-24
5-3-6	RTK - Motherboard	5-25
5-3-7	RFI - Radio Frequency Interface “Controller” Board	5-26

5-3-1 RTF- Probe Connector Board

Switches the Probe Connectors (3 DLP-Connectors, 1 CW-Connector) and recognizes Probes

- 1 CW-Probe Connector
- 3 Probe-Connectors 408pin
- 1 Dummy-Probe Connector 408pin
- Probe Select Relays
- Probe Recognition

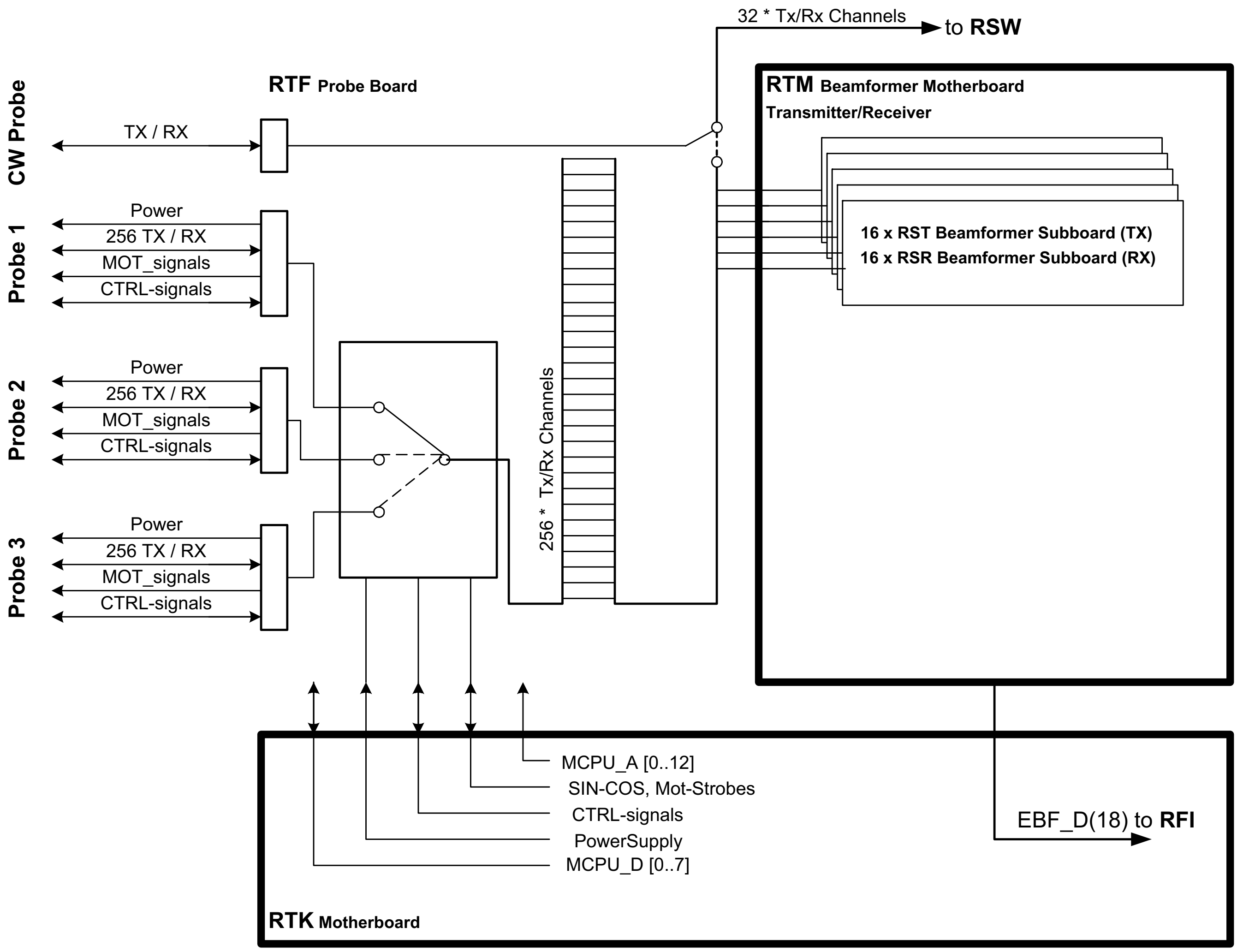


Figure 5-7 RTF + Beamformer (RTM)

5-3-2 RTM - Beamformer Motherboard

Connects Transmitter- and Receiver Subboards

The RTM Beamformer Motherboard contains:

- 16 pieces of RSR (see: Section 5-3-3 "RSR- Beamformer Receiver Subboards" on page 5-24)
- 16 pieces of RST (see: Section 5-3-4 "RST- Beamformer Transmitter Subboards" on page 5-24)
- 1 (optional) RSW (see: Section 5-3-5 "RSW - CW-Doppler Board (optional)" on page 5-24)

5-3-3 RSR- Beamformer Receiver Subboards

Time Gain Correction (TGC), Anti Aliasing-Filtering, Focus-Delay and Analog to Digital Conversion of the Analog receiving signals is performed.

1x : Beamformer-ASIC (NATHAN):

- Rx Focus Delay and Summation
- 16 RX-Channels: TGC + Anit Aliasing Filter + Analog Digital Conversion (ADC)

5-3-4 RST- Beamformer Transmitter Subboards

1x : Beamformer-ASIC (DAVID):

- generates TX-Pulses +TX-Apodization + TX-Focus
- 16 TX-Channels

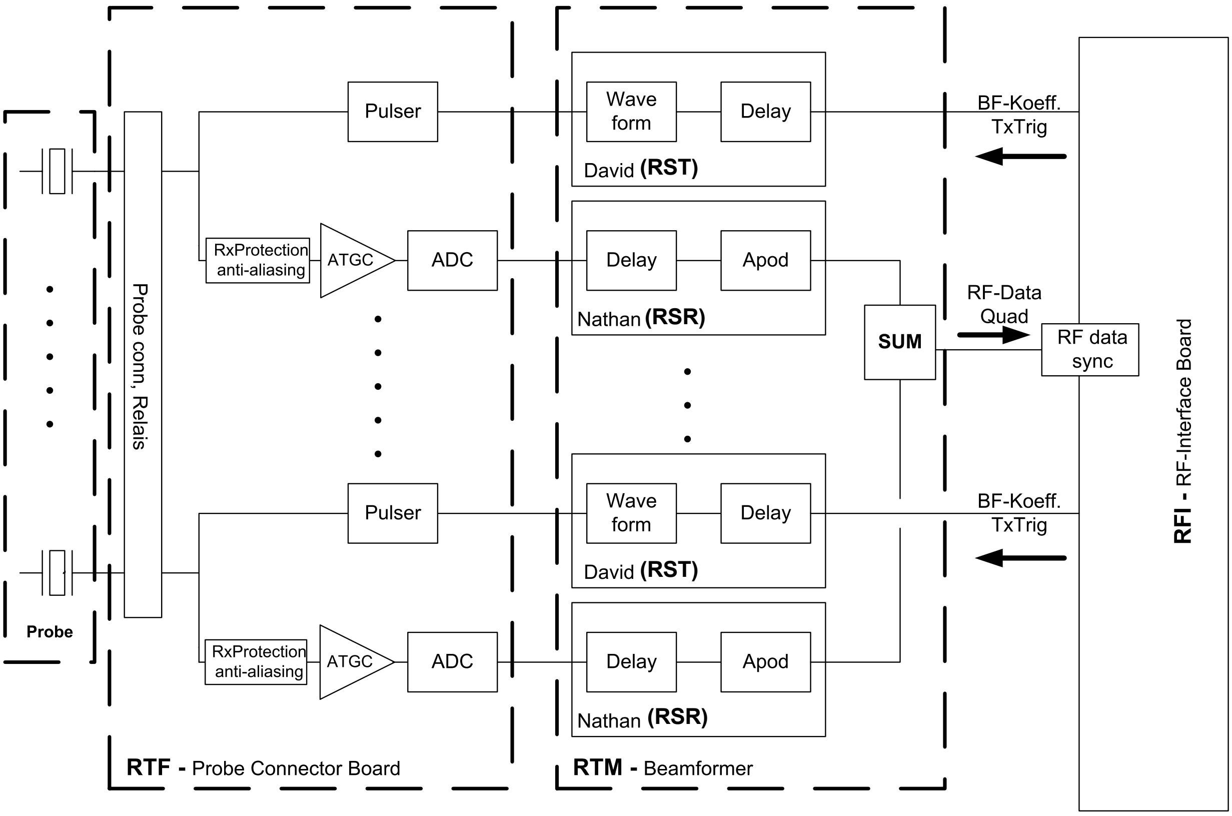


Figure 5-8 Beamformer + Frontend

5-3-5 RSW - CW-Doppler Board (optional)

- Receiver Amplifiers
- IQ Demodulators
- BF (Phase Shift)
- WMF
- Anti Aliasing filter for ADC
- ADC (18 Bit, 390 kHz)
- FPGA for Controlling
- Mid Board Interface

5-3-6 RTK - Motherboard

Connects the following boards/components (connection board only, no active electronics)

- RTF- Probe Connector Board on page 5-22
- RTM - Beamformer Motherboard on page 5-23
- RFI - Radio Frequency Interface “Controller” Board on page 5-26
- RTN - Primary Power Module (AC/AC) on page 5-54
- RTP - Secondary Power Supply (AC/DC) on page 5-55
- Fans - Fan Tray (3 Fans)

5-3-7 RFI - Radio Frequency Interface “Controller” Board

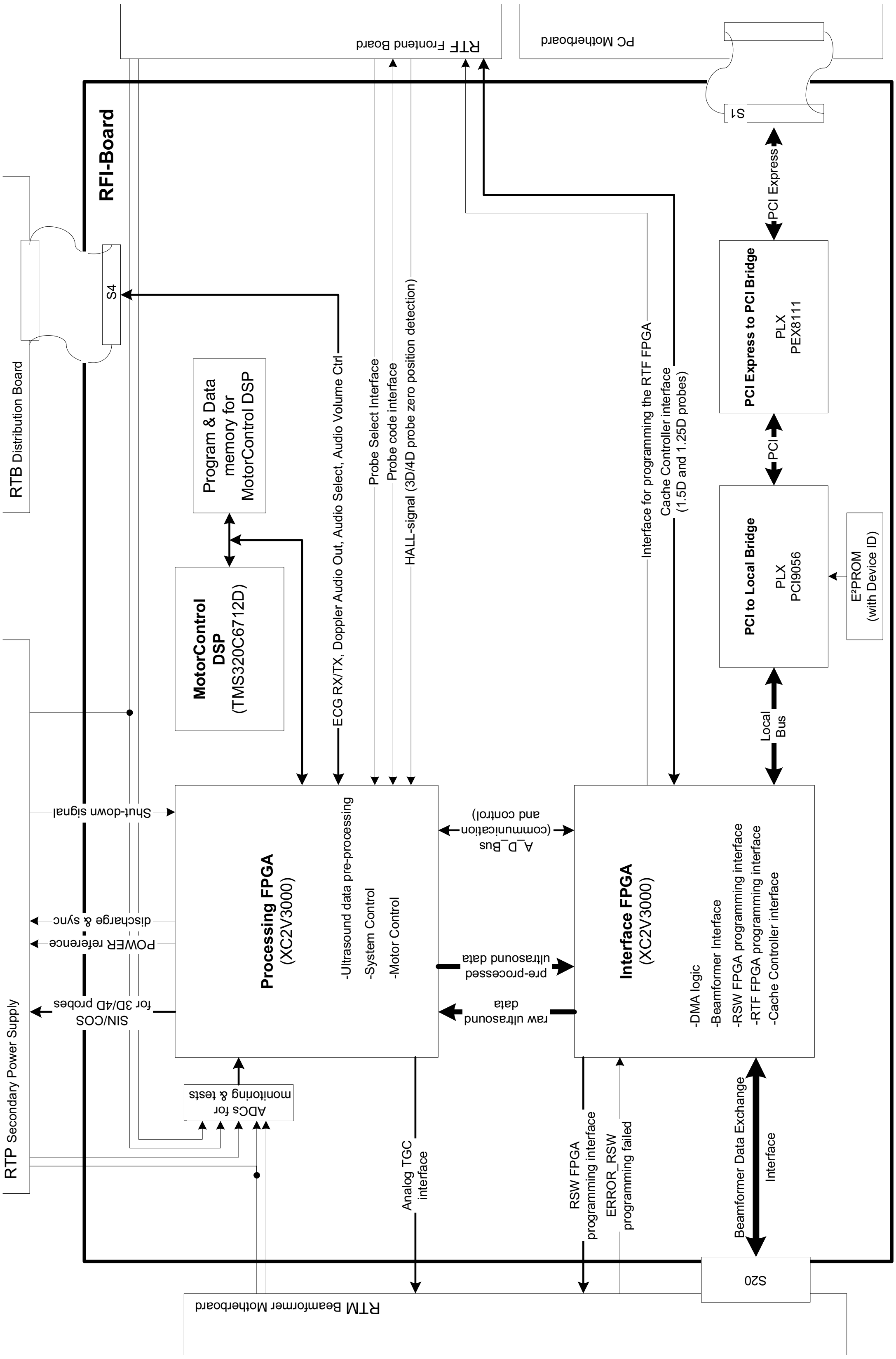


Figure 5-9 RFI-Board - Block diagram

5-3-7-1 RFI Board - Interface FPGA

A.) DMA logic

B.) Beamformer Interface

C.) RSW FPGA programming interface

D.) RTF FPGA programming interface

E.) RTF FPGA programming interface

5-3-7-2 RFI Board - Processing FPGA

A.) Ultrasound Data Pre-Processing

B.) System Control

C.) Motor Control

Section 5-4
BackEnd Processor

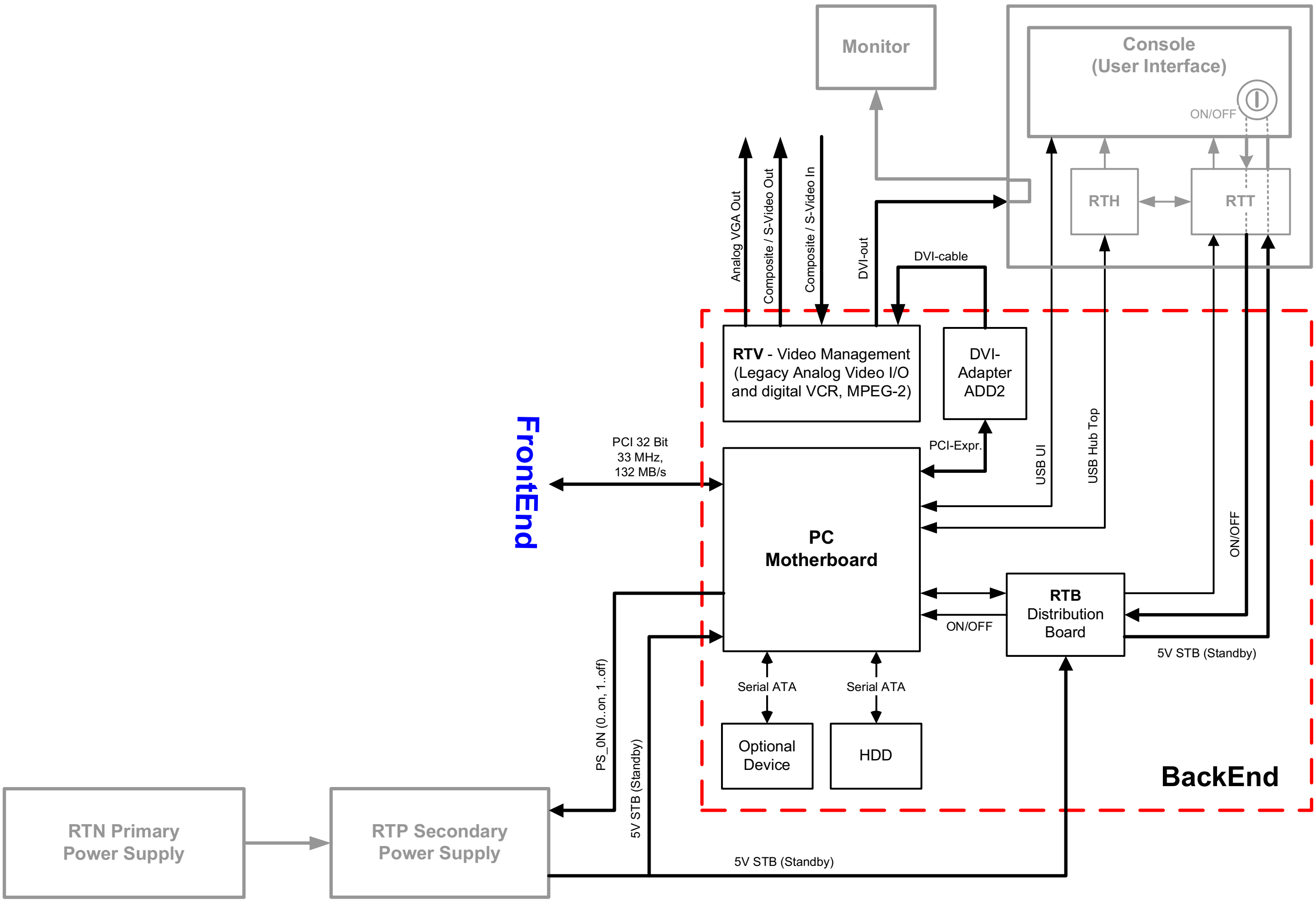


Figure 5-10 BackEnd Processor - Block diagram

Table 5-5 below outlines the Voluson® E8 BackEnd components described in the sub-sections.

Table 5-5 Voluson® E8 - BackEnd components

Sub-section	Description	Page Number
5-4-1	Hard Disk Drive	5-29
5-4-2	PC-Motherboard	5-29
5-4-3	ADD2-DVI (Add-On) Graphic Adapter Card	5-30
5-4-4	RTV - Video Management Board	5-30
5-4-5	RTB - Distribution Board Bottom	5-32

5-4-1 Hard Disk Drive

The Hard Disk is the main storage device of the Voluson® E8 ultrasound system.
The Voluson® E8 160GB Hard disk is divided into 4 partitions.

For further details see: Section 5-2-6 "Data Location" on page 5-20.

5-4-2 PC-Motherboard

5-4-2-1 BT06 (KONTRON or TYAN)

Built in or external Components:

- On Board VGA
- LAN
- USB 2.0
- Sound
- CPU: 3401 MHz

Major Tasks:

- System Control
- 2D- / 3D- / 4D- Image processing and Rendering
- Control DVD drive (USB)
- Control User Interface (USB)

5-4-2-2 BT08 (KONTRON Dual-core or DFI Dual-core)

Built in or external Components:

- On Board VGA
- LAN
- USB 2.0
- Sound
- CPU: 2133 MHz Dual

Major Tasks:

- System Control
- 2D- / 3D- / 4D- Image processing and Rendering
- Control DVD drive (USB)
- Control User Interface (USB)

5-4-3 ADD2-DVI (Add-On) Graphic Adapter Card

DVI graphic extension card which supplies RTV (Video manager) board with DVI Video

5-4-4 RTV - Video Management Board

Distributes DVI-D-information coming from the ADD2-DVI Graphic Adapter Card to the DVI-D (digital) and DVI-I (integrated) connectors. Converts DVI-D-inputs to S-Video output(s).
Displays external playback video and adds overlay graphics to it.

- DVI-D input, connection with the ADD-2-DVI Graphic Adapter Card (see: Section 5-4-3)
- DVI-D output for the System Main Monitor
- DVI-I output for external device (only RGB signals used)
- S-Video output (2 channels)
- S-Video input for external devices
- USB connector for board configuration

5-4-4 RTV - Video Management Board (cont'd)

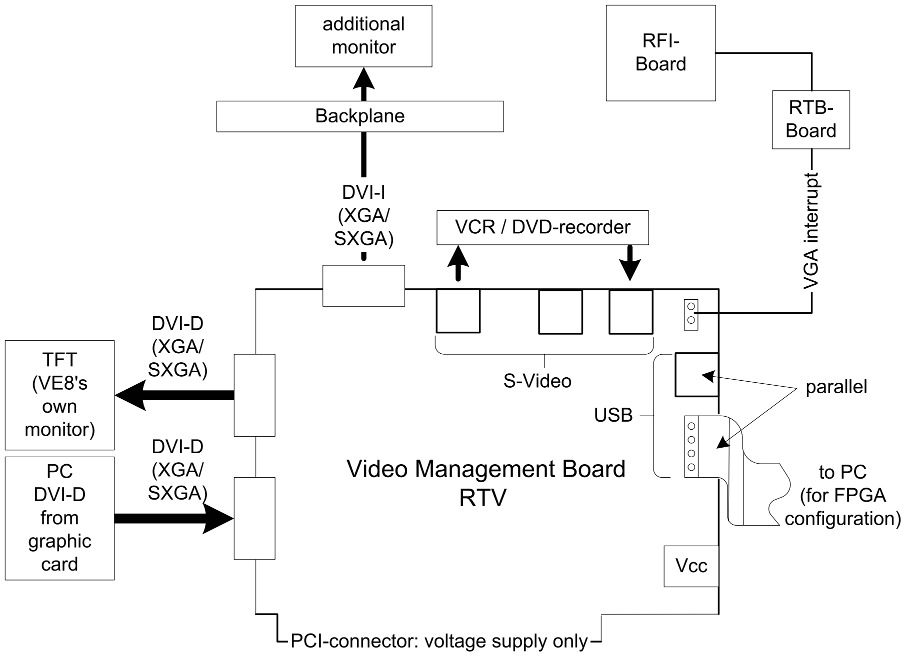


Figure 5-11 RTV - Block diagram

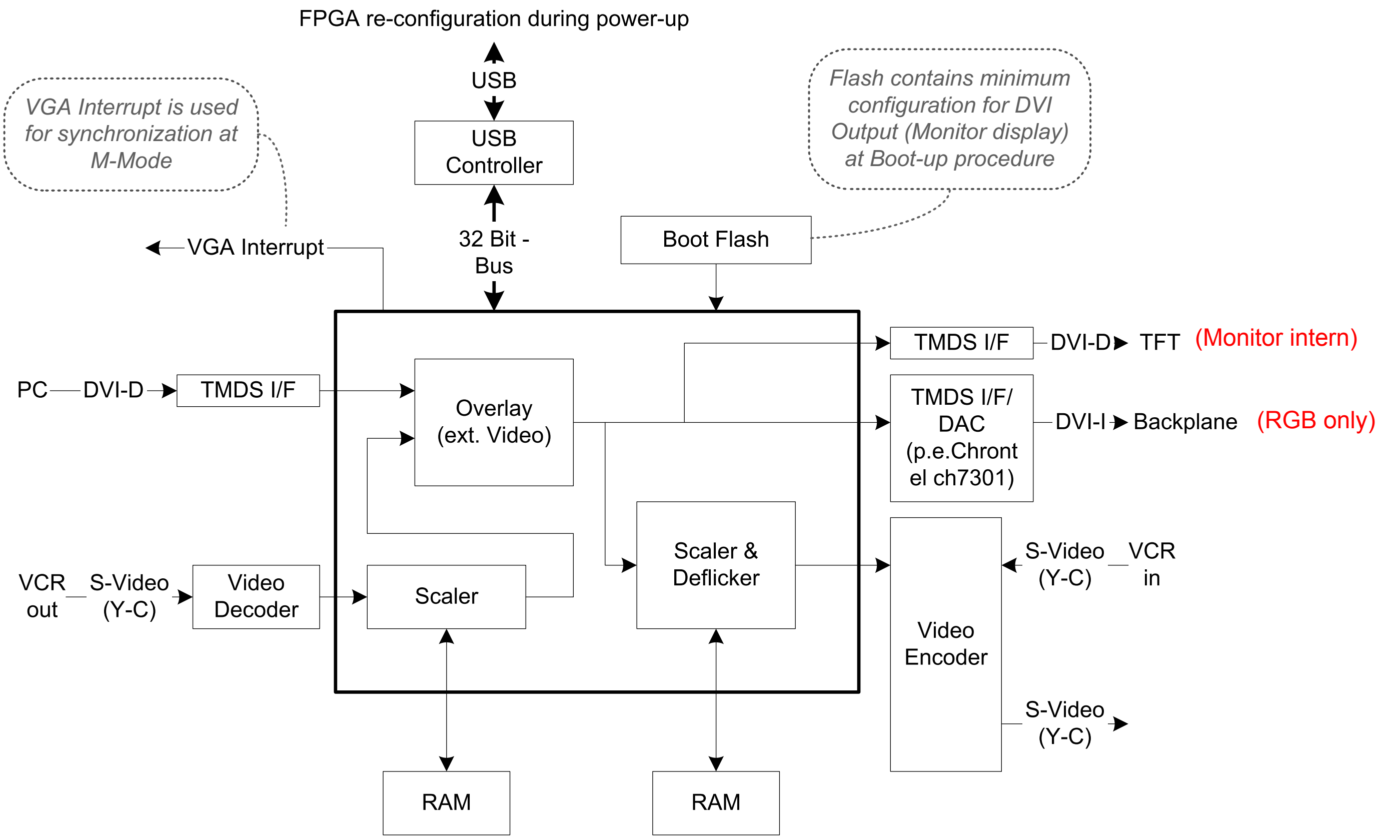


Figure 5-12 RTV Video I/O

5-4-5 RTB - Distribution Board Bottom

Function of the Distribution Board Bottom (RTB):

- USB2.0 Interface, Board is connected to PC via USB cable
- 5 port USB2.0 Hub for connecting Peripherals
- Feed through DC-Power and Signals for the Console (12V_ATX, 5V_ATX, 5VSB, PWR_On, Start_Key, Loud speaker)
- Connector for ECG –Preamplifier (optional)
- Multiplexer and Amplifier for PC-Sound, Doppler Audio and VCR/DVD-Recorder

5-4-5-1 RTB1-3 (BT06 only) Block Diagram

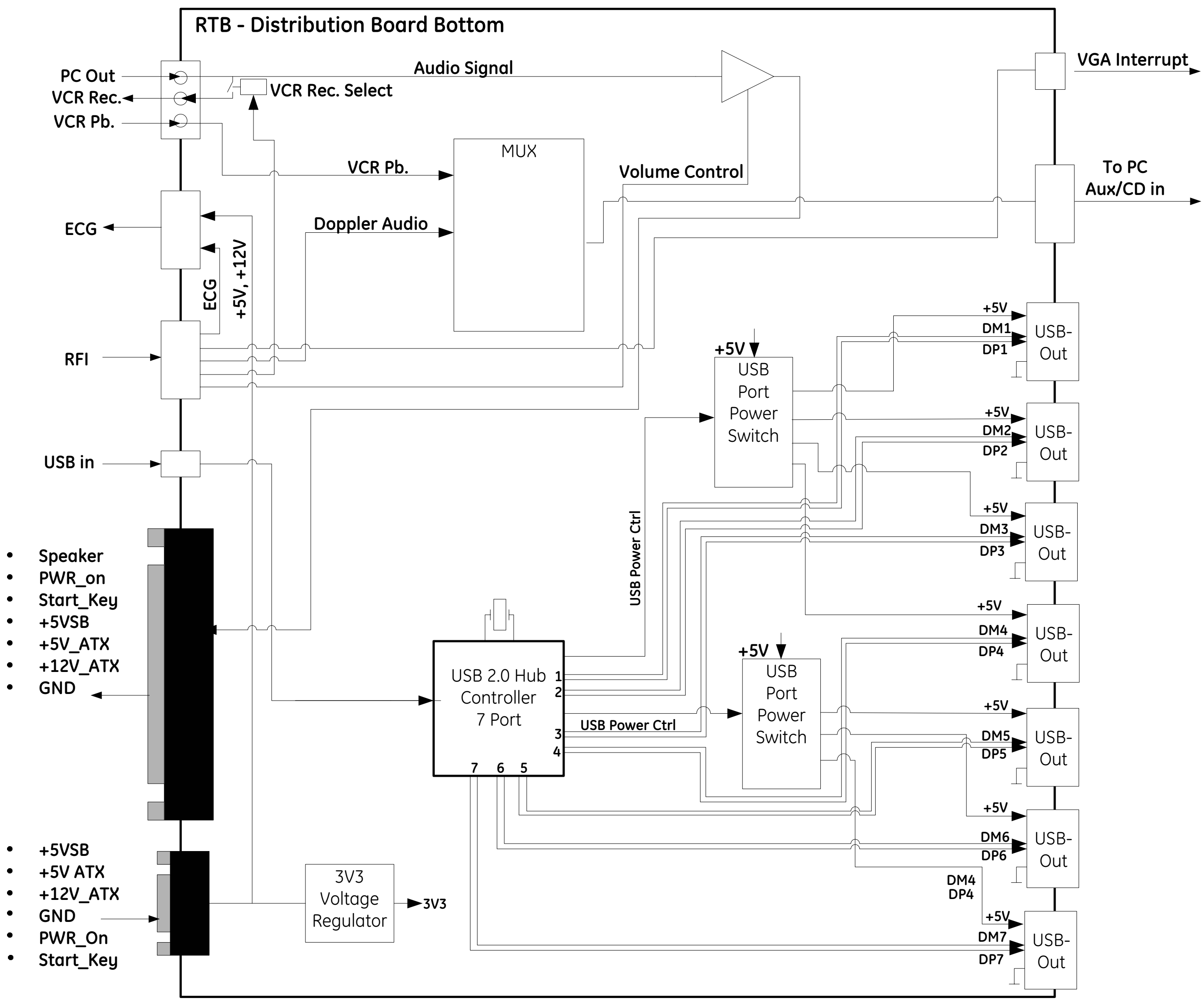


Figure 5-13 RTB1-3 (BT06 only)- Block diagram

5-4-5-2 RTB4 - Block Diagram

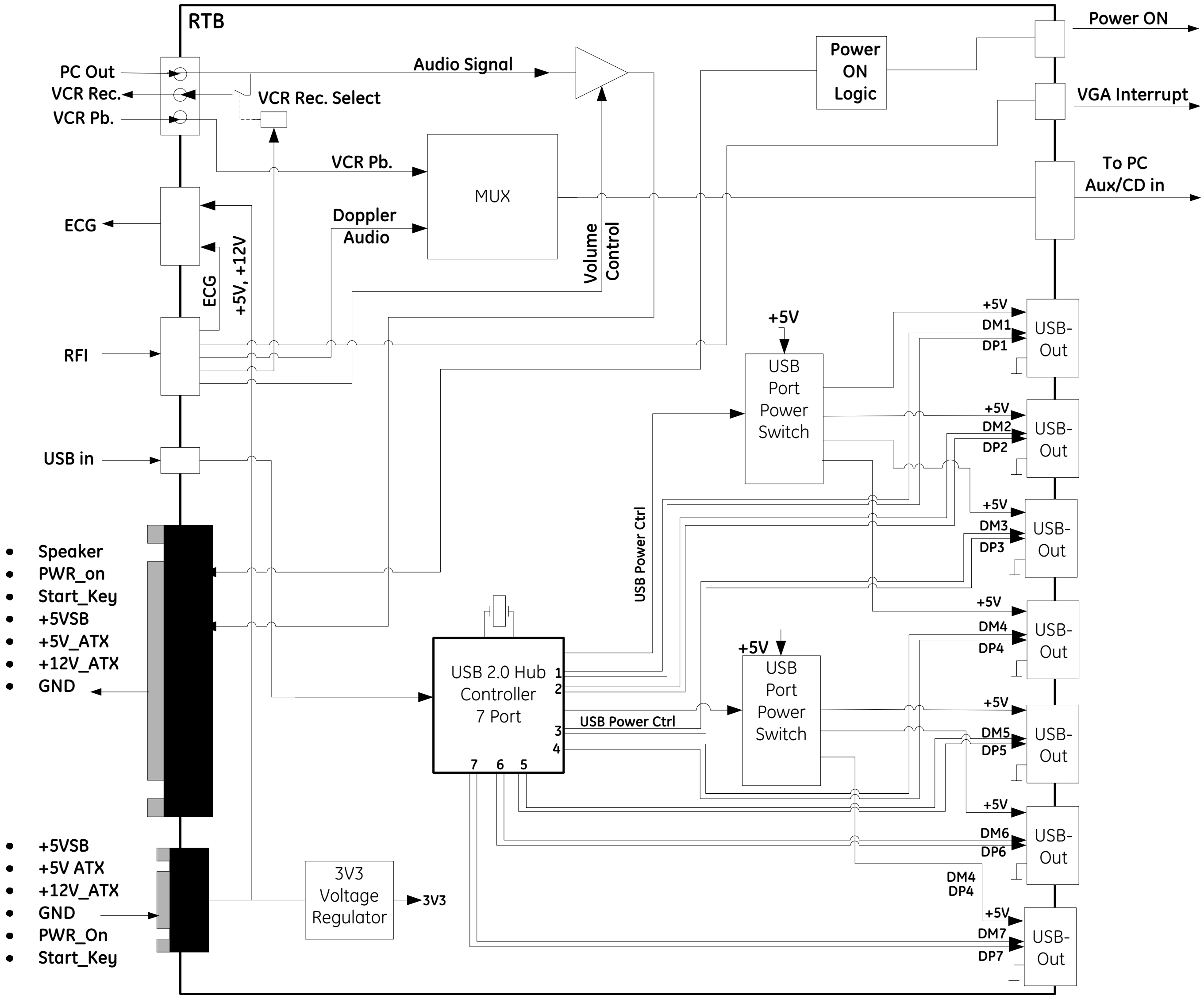


Figure 5-14 RTB4- Block diagram

Section 5-5
Internal I/O

Internal In/Out connections depend on the currently installed PC Motherboard. The version can be read out in the **System Setup - Administration - SYSTEM INFO page** (see: Figure 7-1 on page 7-2).

BT Version: Please observe that internal In/Out connections depend on the installed Hardware components and BT-version of the Voluson® E8 system.

- **BT06** (SW 6.x.x installed):
  - “**Kontron**” PC-Motherboard with **old HW** components (GES14, RTT1-2, RTH1-3, RTB1-3) is installed, see: Figure 5-15 on page 5-35.
  - “**Kontron**” PC-Motherboard with **new HW** components (GES15, RTT3, RTH4, RTB4) is installed, see: Figure 5-16 on page 5-36.
  - “**Tyan**” PC-Motherboard with **old HW** components (GES14, RTT1-2, RTH1-3, RTB1-3) is installed, see: Figure 5-17 on page 5-37.
  - “**Tyan**” PC-Motherboard with **new HW** components (GES15, RTT3, RTH4, RTB4) is installed, see: Figure 5-18 on page 5-38.
- **BT08** (SW 7.x.x installed):
  - If “**Kontron Dual-core**” PC Motherboard is installed, see: Figure 5-19 on page 5-39.
  - If “**DFI Dual-core**” PC Motherboard is installed, see: Figure 5-20 on page 5-40.

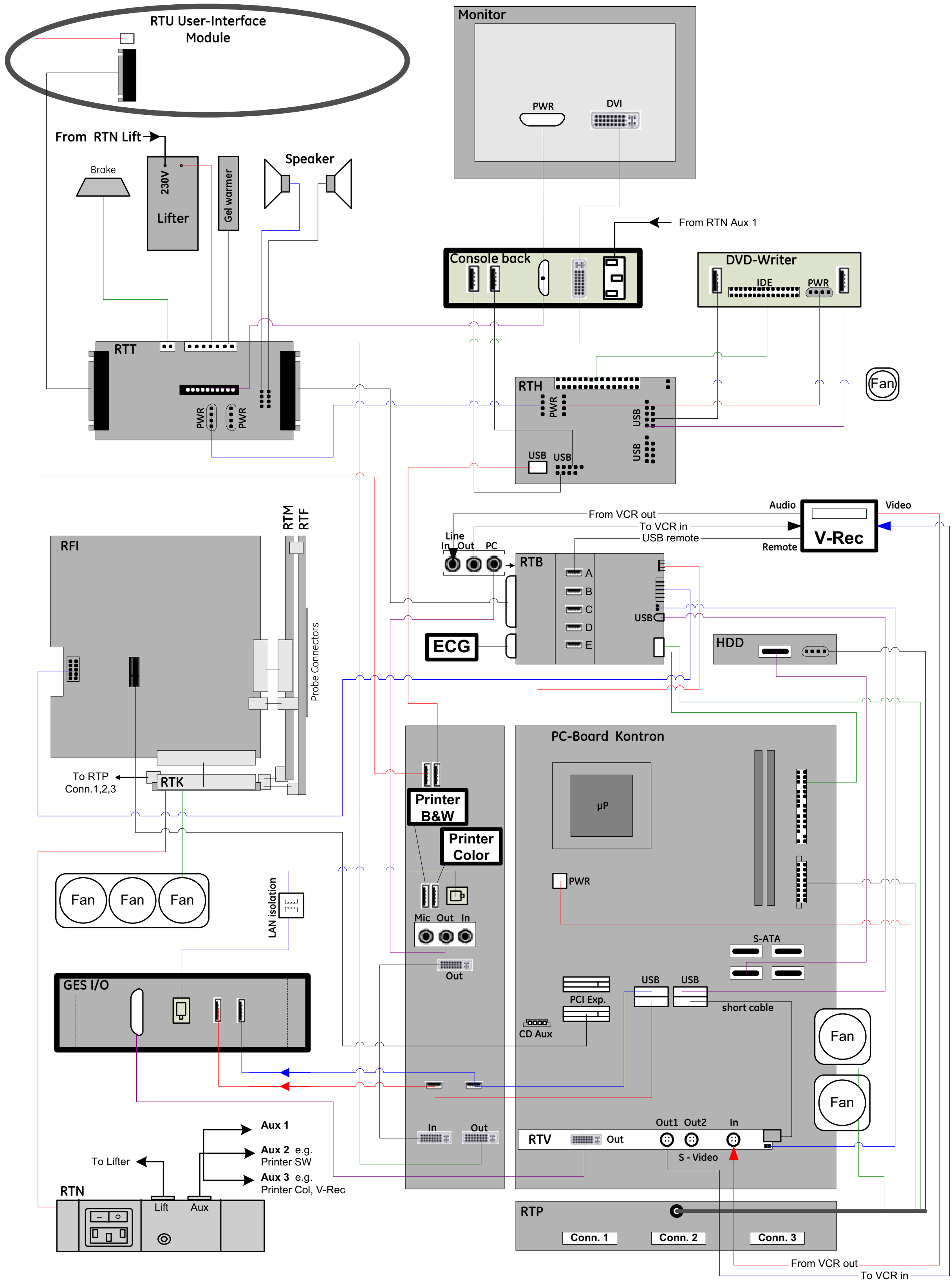


Figure 5-15 Internal I/O - BT06: KONTRON PC-Motherboard with old HW components (GES14, RTT1-2, RTH1-3 and RTB1-3) installed

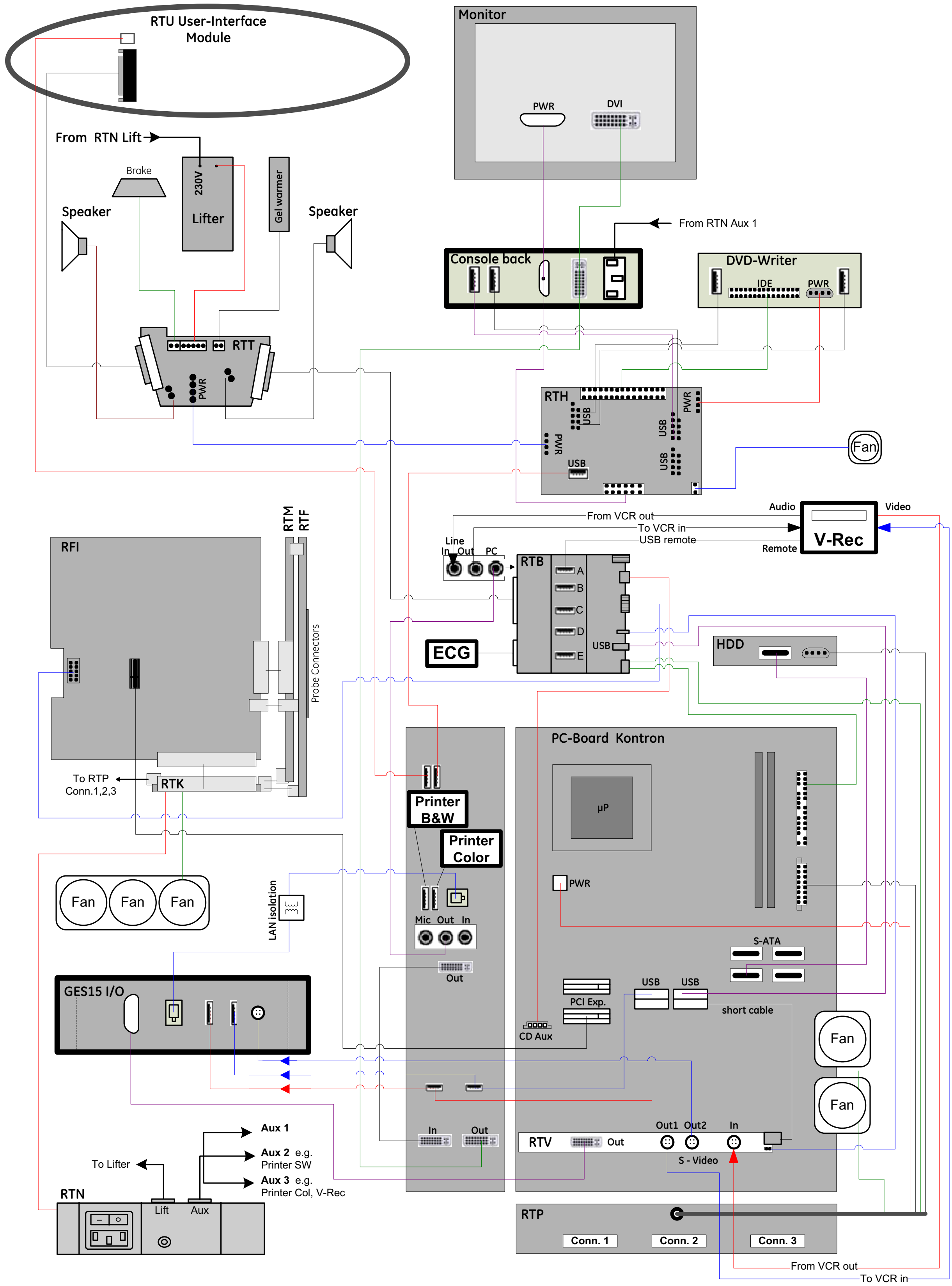


Figure 5-16 Internal I/O - BT06: KONTRON PC-Motherboard with new HW components (GES15, RTT3, RTH4 and RTB4) installed

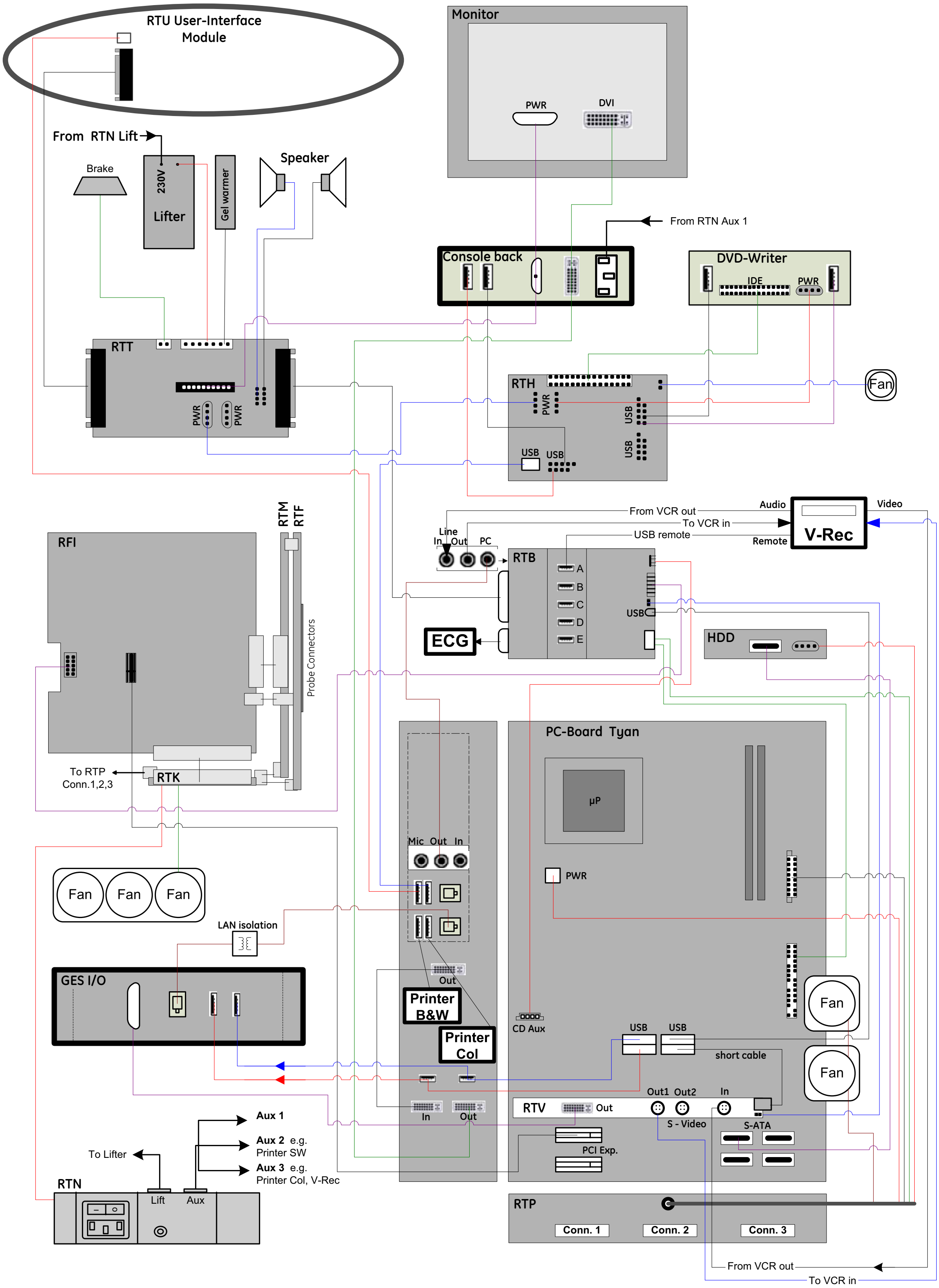


Figure 5-17 Internal I/O - BT06: TYAN PC-Motherboard with old HW components (GES14, RTT1-2, RTH1-3 and RTB1-3) installed

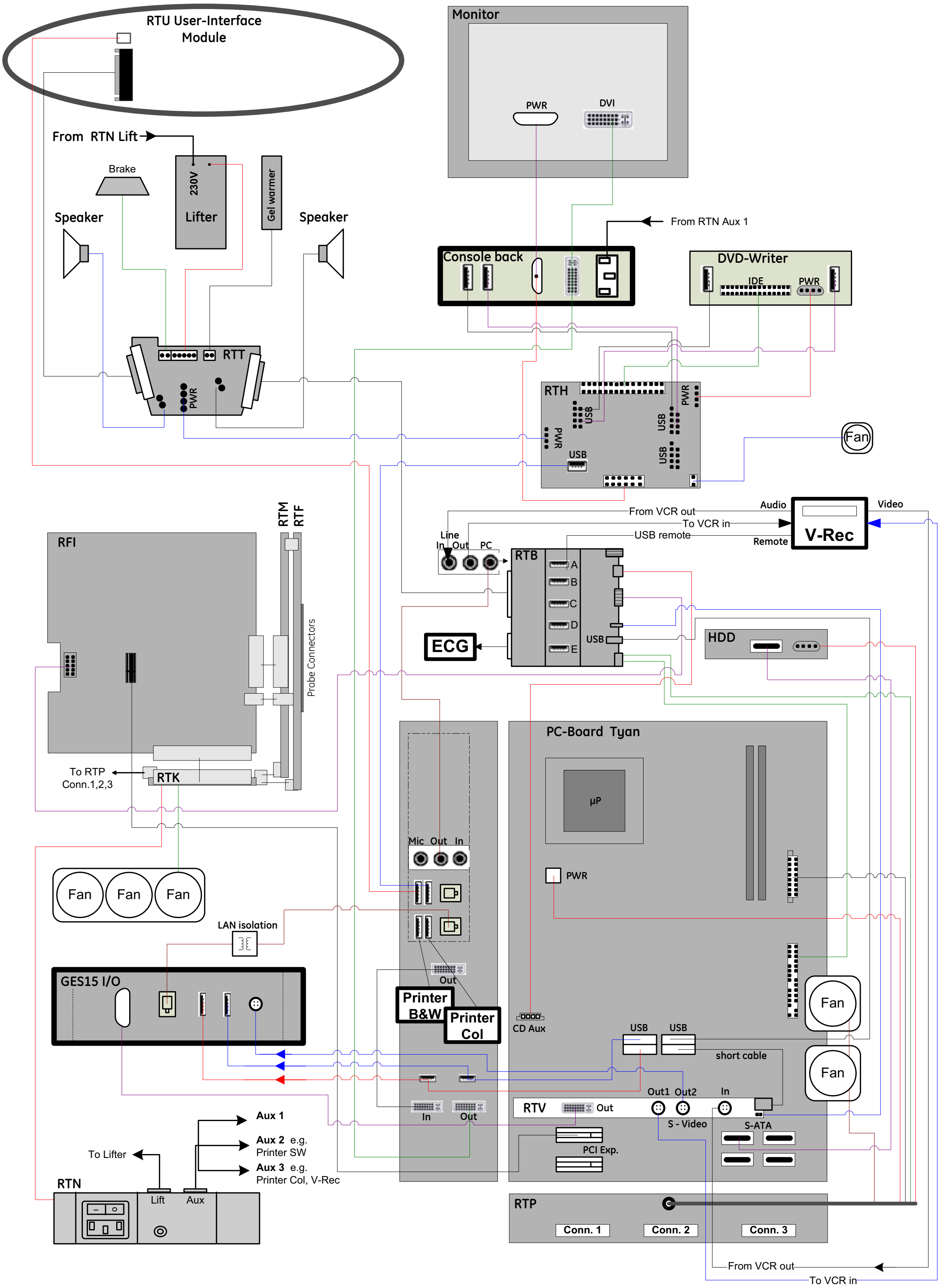


Figure 5-18 Internal I/O - BT06: TYAN PC-Motherboard with new HW components (GES15, RTT3, RTH4 and RTB4) installed

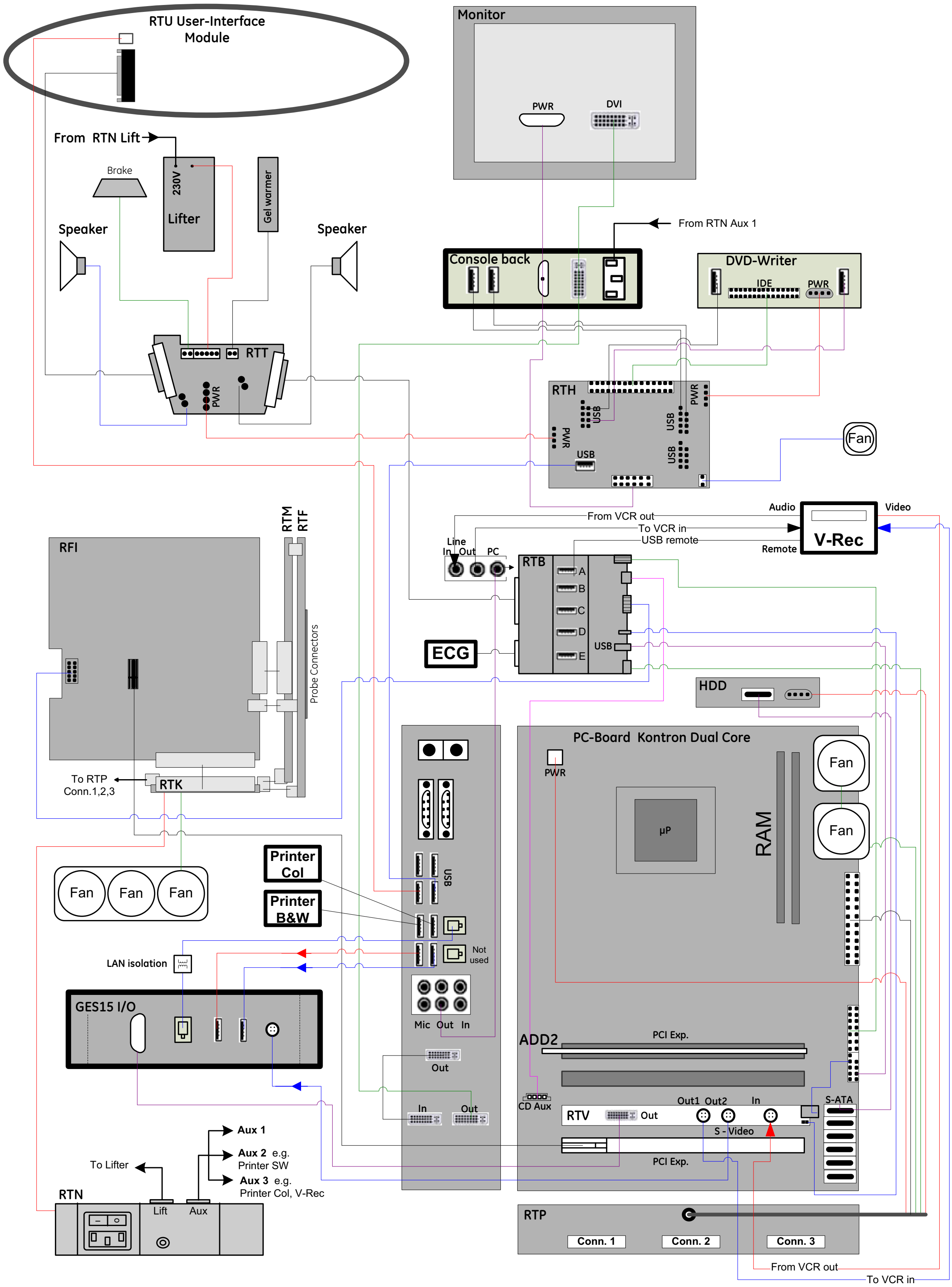


Figure 5-19 Internal I/O - BT08: KONTRON Dual-core PC-Motherboard installed

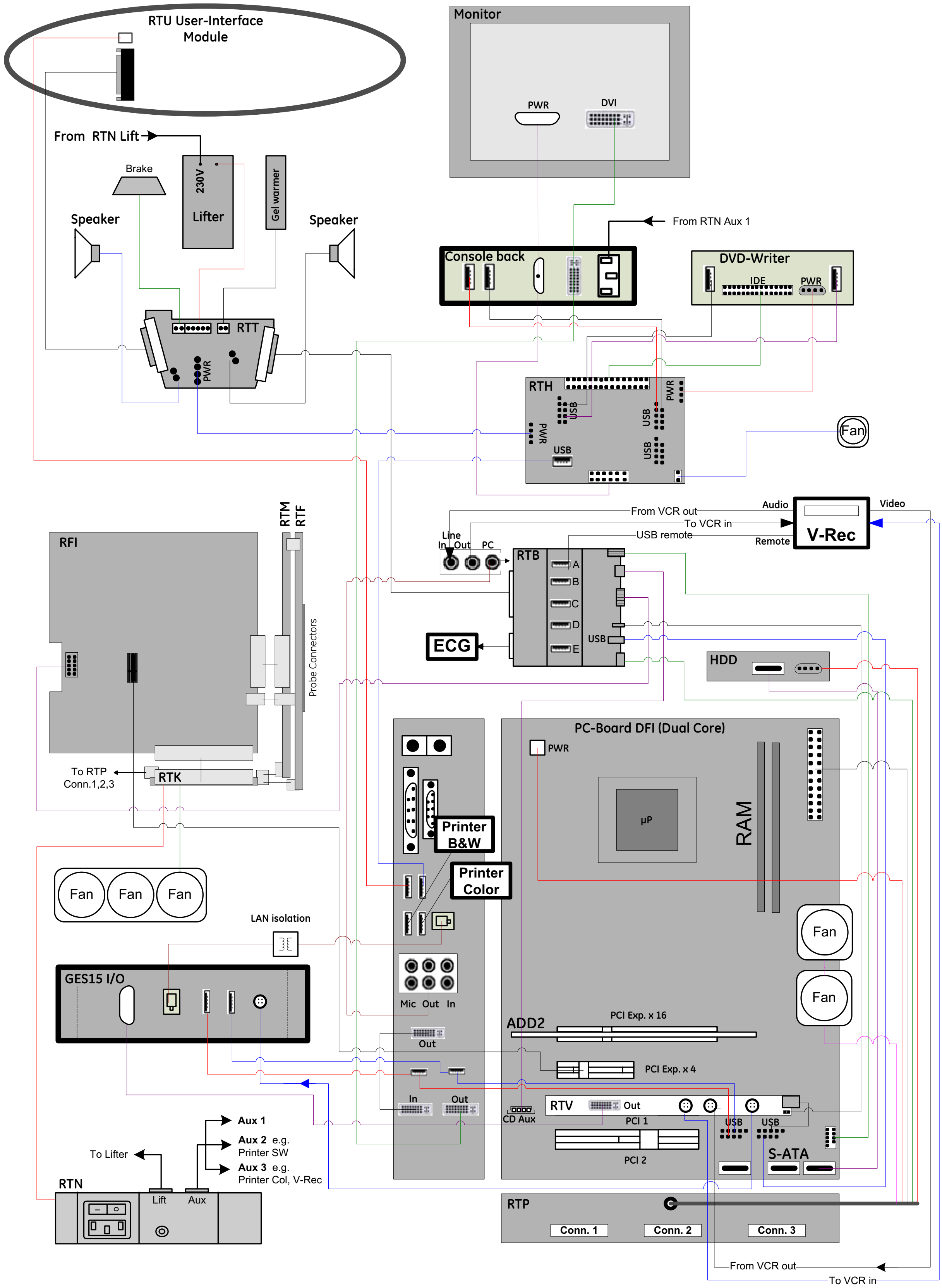


Figure 5-20 Internal I/O - BT08: DFI Dual-core PC-Motherboard installed

Section 5-6
Top Console (User Interface)

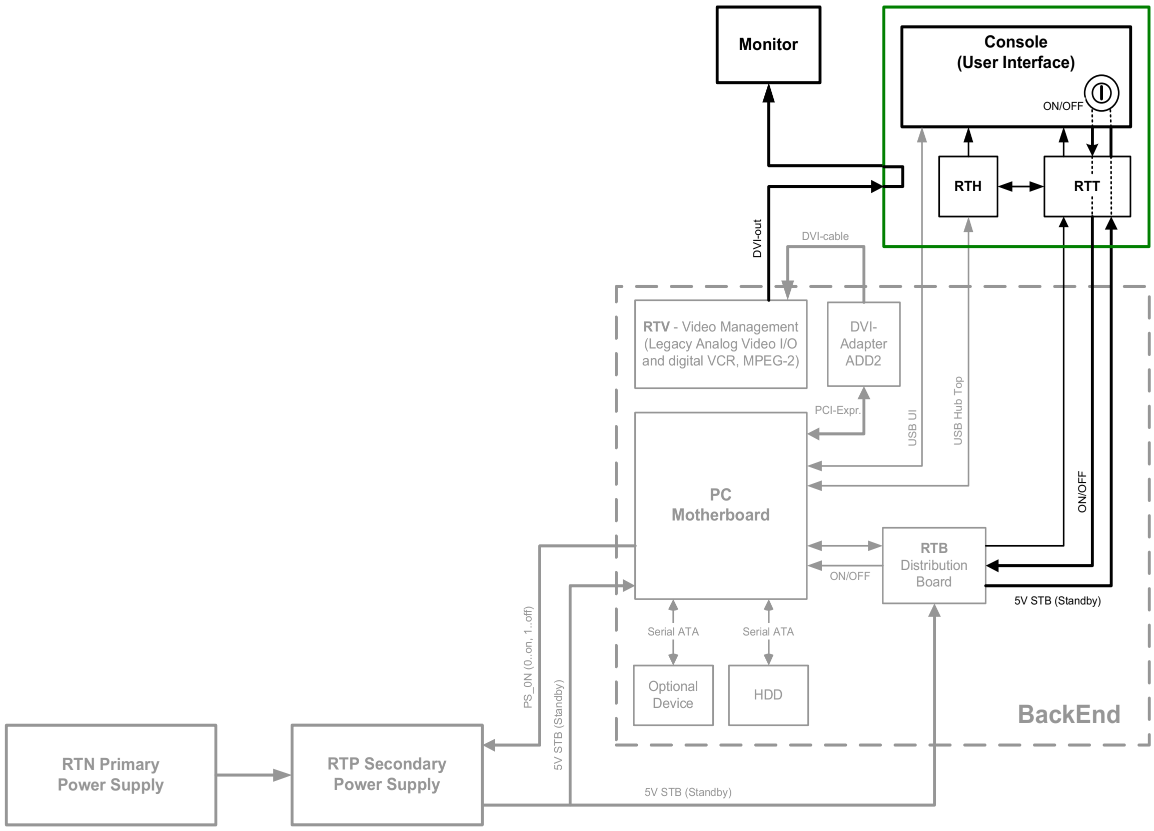


Figure 5-21 Front End Processor - Block diagram

The Voluson® E8 Control Panel (User Interface) consists of the following electronic subassemblies and/or functional components:

- Display/Touch screen module:
  - VGA display – 640x480 pixels
  - Integrated USB to VGA converter with USB2.0 High Speed Interface
  - Resistive 5 wire analog touch screen
- Console module:
  - Micro controller C8032
  - 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
  - USB extended keyboard with controller
  - LED Indicators with wide range dimming
- DC/DC Converter:
  - Converts 12VDC input voltage to 5VDC and 3.3VDC output voltage for supplying User Interface components

Section 5-6 Top Console (User Interface) (cont'd)

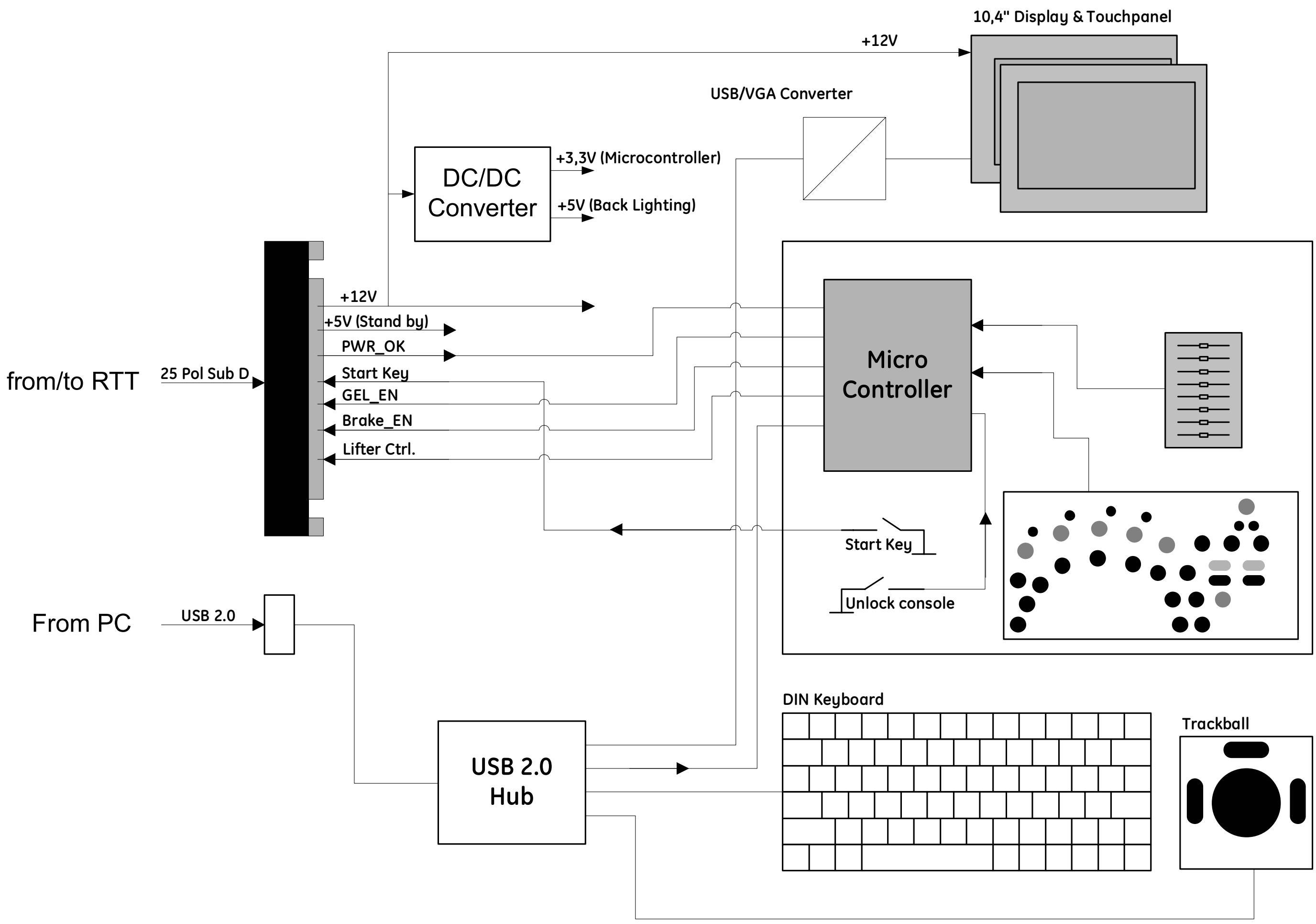


Figure 5-22 User Interface

5-6-1 RTH - Distribution Board USB-Hub

Function of the Distribution Board Hub (RTH):

- USB2.0 Interface, Board is connected to PC via USB cable
- 7 port USB2.0 Hub
- 4 USB Ports for external use
- 1 USB to IDE Converter for DVD Drive
- 2 USB Ports not used
- Power distribution for Monitor (RTT4 board **only**!)
- Feed through for DC-Power for the DVD Drive and Fan

5-6-1-1 RTH1-3 (BT06 only) - Block Diagram

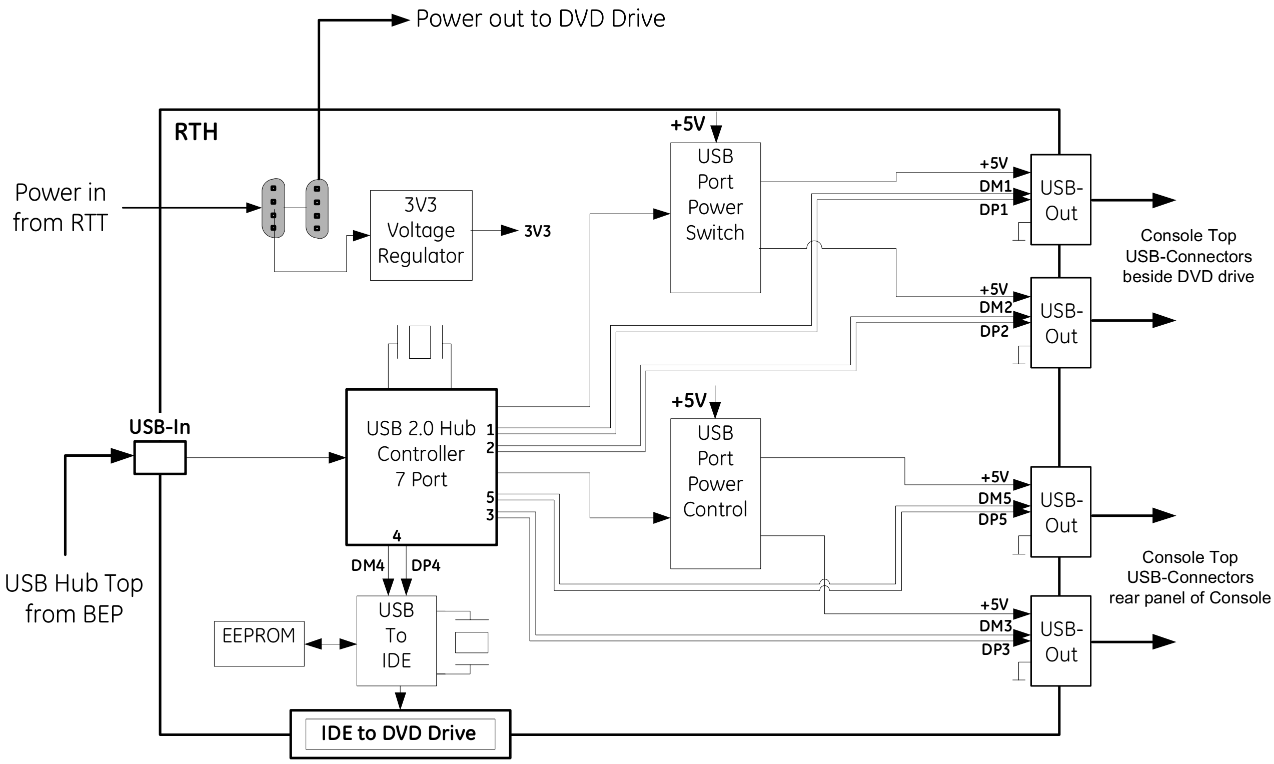


Figure 5-23 RTH1-3 (BT06 only) - Block diagram

5-6-1-2 RTH4 - Block Diagram

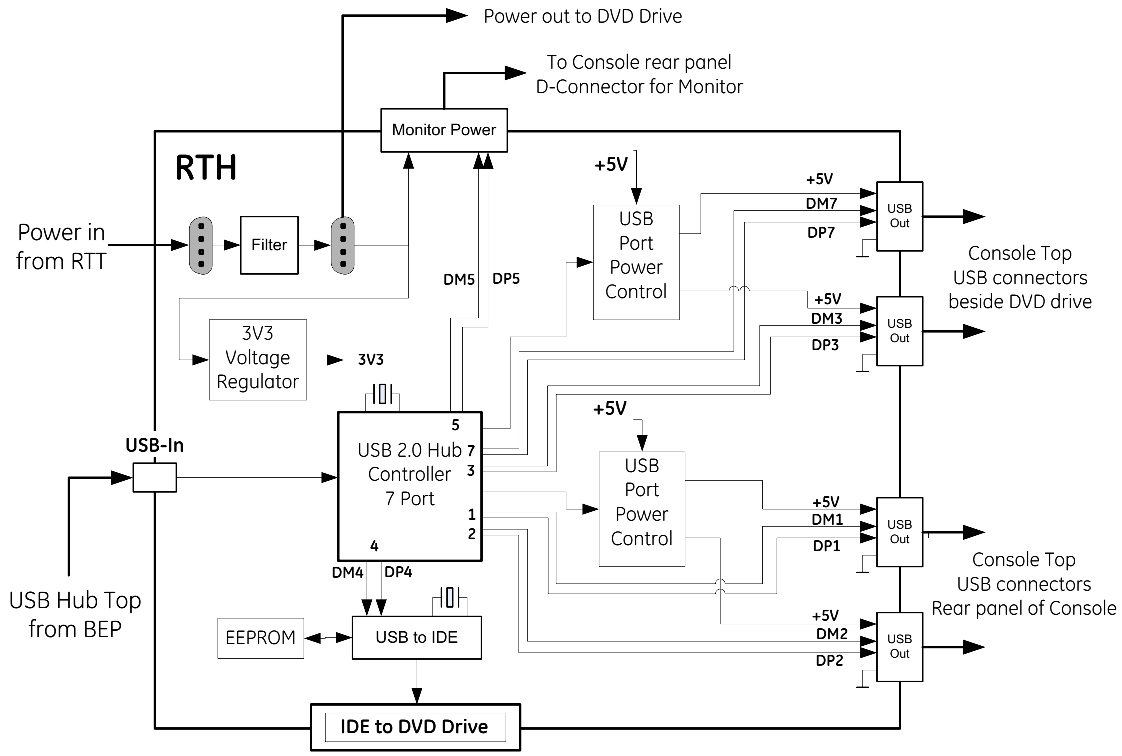


Figure 5-24 RTH4 - Block diagram

5-6-2 RTT - Distribution Board Top

Function of the Distribution Board Top RTT:

- Feed through for DC-Power (12V_ATX, 5V_ATX, 5VSB) and Signals (PWR_On, Start_Key, Speaker, Lifter control, UI_Brake)
- Power distribution for Monitor (RTT1-2 board **only**!)
- Power for RTH (Distribution Board Hub)
- Power for DVD-Drive
- Signal switching for UI Brake, Lift and Gel warmer[1]

1.

5-6-2-1 RTT1-2 (BT06 only) - Block Diagram

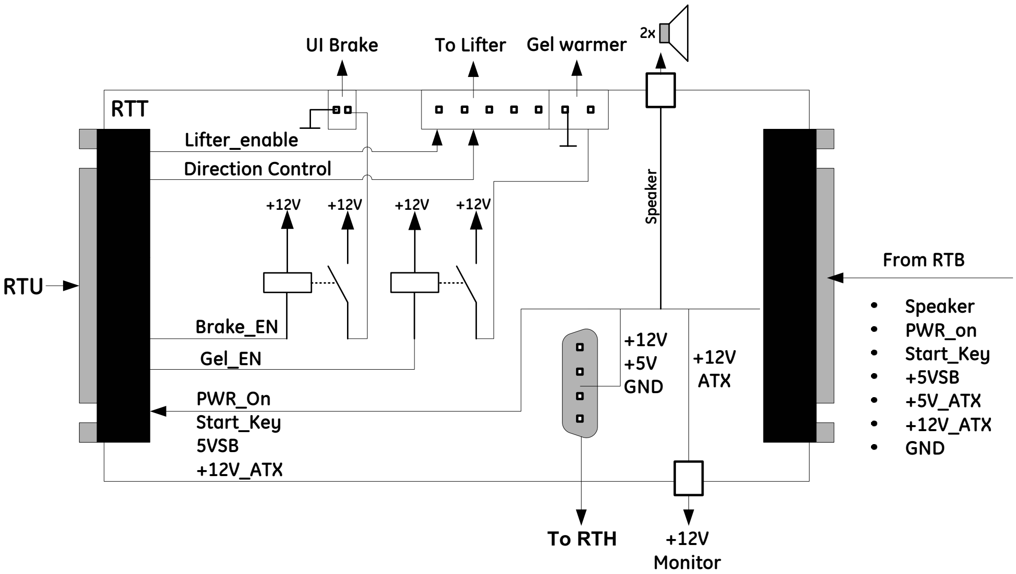


Figure 5-25 RTT1-2 (BT06 only) - Block diagram

5-6-2-2 RTT3 - Block Diagram

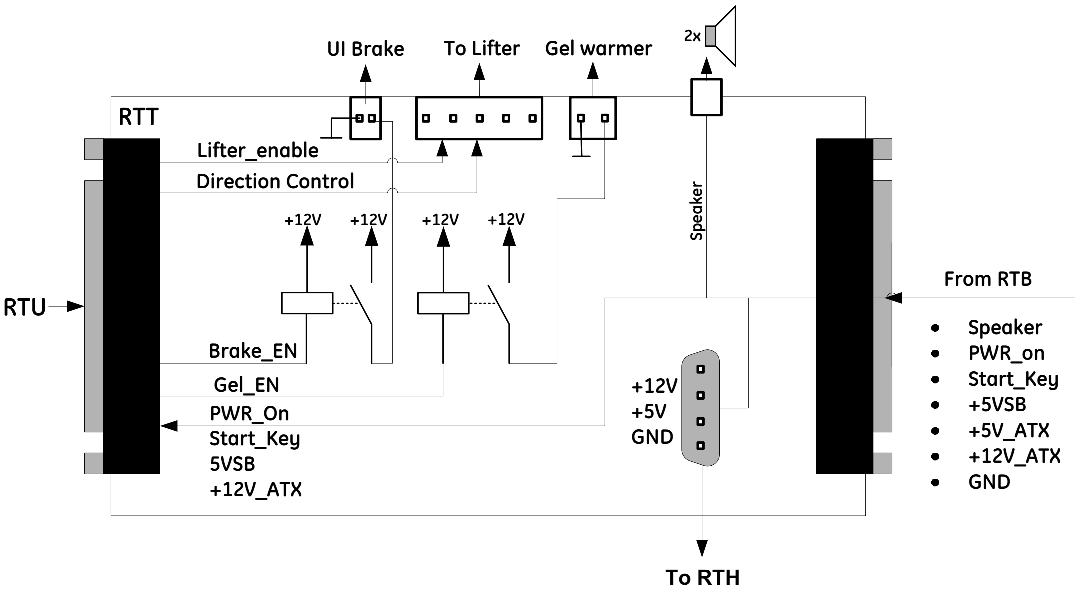


Figure 5-26 RTT3 - Block diagram

5-6-3 Control Console

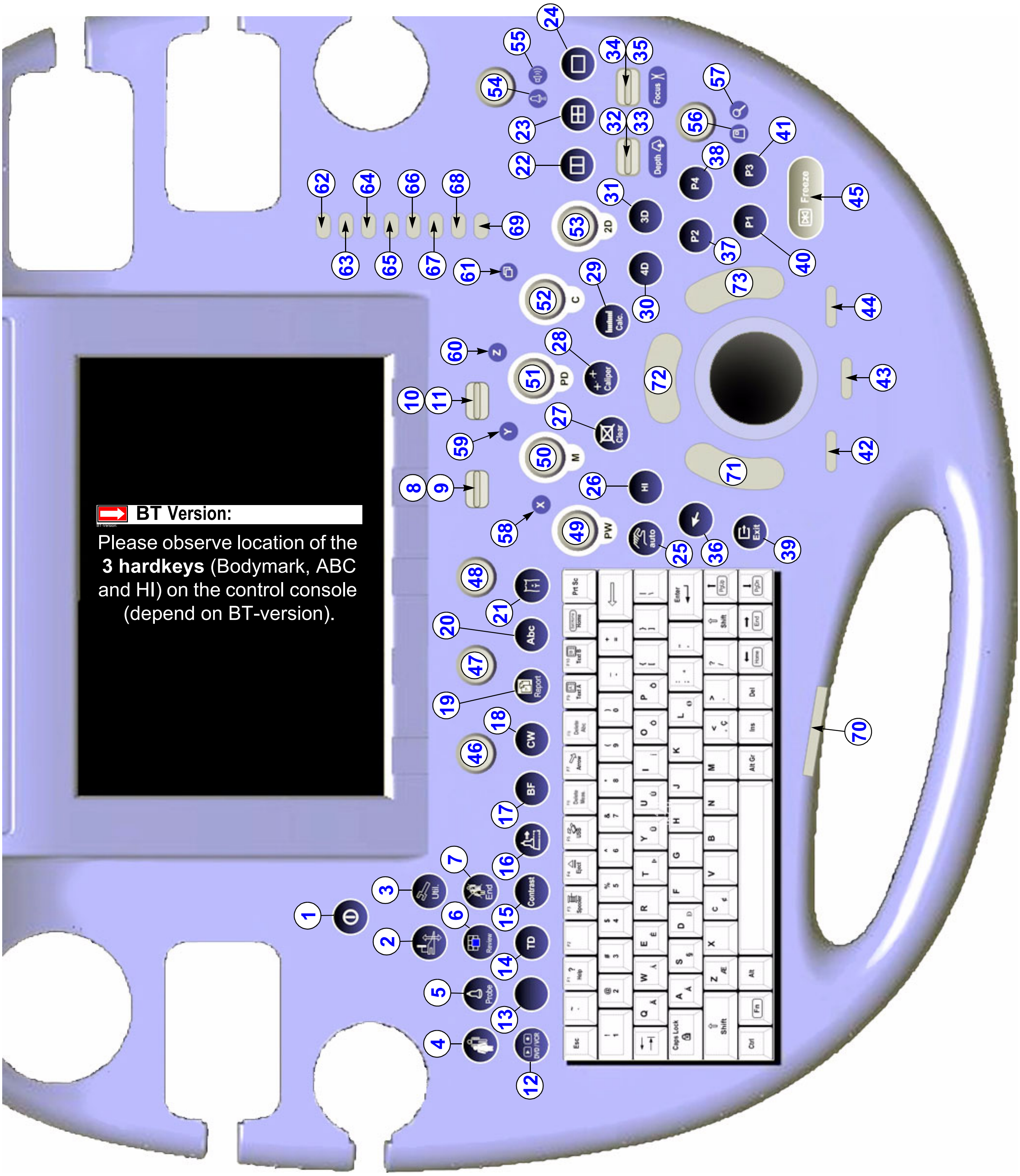


Figure 5-27 Voluson® E8 - Control Console (e.g., BT06)

Table 5-6 Voluson® E8 - key codes

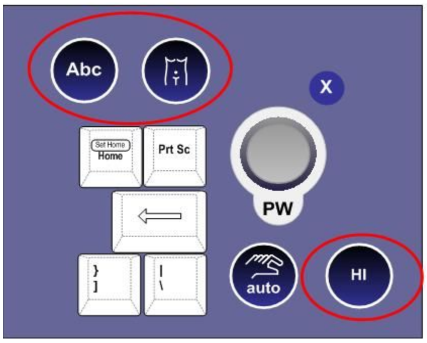
key code	Description	Voluson® E8 - Functionality	X	X	X
1	Power/Standby ON/OFF	On/Off switch of the system			
2	UI Level Adjustment	Height Adjustment (Elevation) of the Control Console (User Interface)			
3	Utilities	call-up of the utilities menu			
4	Patient Data (PID)	call-up of the patient data entry menu and/or patient archive			
5	Probe	call-up of the probe program menu			
6	Review	call-up of exam review mode and/or patient archive			
7	End Exam	Patient and measurement data are stored in the “Data manager”			
8	Paddle (Toggle) switch	UP - Toggle switch (function depends on currently selected mode)			
9	Paddle (Toggle) switch	DOWN - Toggle switch (function depends on currently selected mode)			
10	Paddle (Toggle) switch	UP - Toggle switch (function depends on currently selected mode)			
11	Paddle (Toggle) switch	DOWN - Toggle switch (function depends on currently selected mode)			
12	DVD / VCR	also used to lower control console (in combination with 2 other keys)			
13	none	no functionality			
14	Acquisition Mode TD	invokes TD-Mode (Tissue Doppler Mode)			
15	Acquisition Mode Contrast	invokes Contrast Imaging function			
16	Acquisition Mode XTD	invokes XTD-View (Extended View) function			
17	Acquisition Mode BF	invokes B-Flow function			
18	Acquisition Mode CW	invokes CW-Mode (Continuous Wave Doppler)			
19	Report	call-up of the Patient report page			
20	at BT06: ABC (Text) at BT08: Bodymark	Image Annotation - to write onto the screen Bodymark display - to enter Bodymark symbols			
21	at BT06: Bodymark at BT08: HI	Bodymark display - to enter Bodymark symbols (Coded) Harmonic Imaging			
22	Dual Format (V)	Dual-Screen format (vertical distribution)			
23	Quad Format	Quad-Screen format			
24	Single Format	Single-Screen format			
25	Auto (OTO)	Automatic Optimization			
26	at BT06: HI at BT08: ABC (Text)	(Coded) Harmonic Imaging Image Annotation - to write onto the screen			
27	Clear	to clear graphics, measurements and annotations on the screen			
28	Caliper	Generic Measurements			
29	Calc	Calculation (tables)			
30	Acquisition Mode 4D	invokes Real Time 4D Mode (continuos volume sweep)			
31	Acquisition Mode 3D	invokes 3D Volume Mode			
32	Depth (Toggle) switch	Penetration Depth UP - Toggle switch function			
33	Depth (Toggle) switch	Penetration Depth DOWN - Toggle switch function			
34	Focus Depth (Toggle) switch	Focus Depth UP - Toggle switch function			
35	Focus Depth (Toggle) switch	Focus Depth DOWN - Toggle switch function			
36	Trackball pointer	displays a pointer (arrow or hand shaped cursor)			
37	P2	programmable key			
38	P4	programmable key			
39	Exit	Exit current menu			
40	P1	programmable key			
41	P3	programmable key			
42	Trackball Mode switch	function depends on currently selected mode			

Table 5-6 Voluson® E8 - key codes

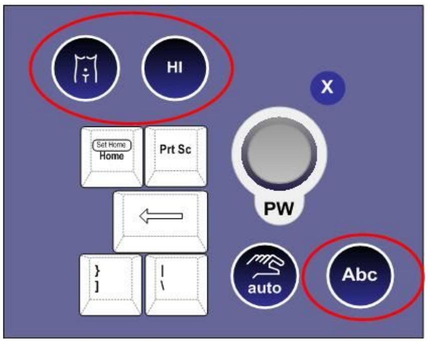
key code	Description	Voluson® E8 - Functionality	X	X	X
43	Trackball Mode switch	function depends on currently selected mode			
44	Trackball Mode switch	function depends on currently selected mode			
45	Freeze	Read/Write (Freeze/Run)			
46	Encoder 1	function depends on currently selected mode			
47	Encoder 2	function depends on currently selected mode			
48	Encoder 3	function depends on currently selected mode			
49	Encoder PW-Mode	PW-Mode (Pulsed Wave Doppler)			
50	Encoder M-Mode	M-Mode (Motion Mode)			
51	Encoder PD-Mode	PD-Mode (Power Doppler) and HD-Mode (Bi-Directional Angio)			
52	Encoder C-Mode	C-Mode (Color Flow Mode)			
53	Encoder 2D-Mode	2D-Mode (B-Mode)			
54	label illuminated: Power (Probe)	Acoustic Output (Ultrasound emission of a probe)			
55	label illuminated: Power (Speaker)	Acoustic Output (Speakers)			
56	label illuminated: HR-Zoom	image magnification of selected image area			
57	label illuminated: Pan Zoom	image magnification of complete image			
58	label illuminated: X	Volume Mode icon (rotation about X-axis)			
59	label illuminated: Y	Volume Mode icon (rotation about Y-axis)			
60	label illuminated: Z	Volume Mode icon (rotation about Z-axis)			
61	label illuminated:	Volume Mode icon (movement along Z-axis)			
62	Slider 1	TGC Slider Control			
63	Slider 2	TGC Slider Control			
64	Slider 3	TGC Slider Control			
65	Slider 4	TGC Slider Control			
66	Slider 5	TGC Slider Control			
67	Slider 6	TGC Slider Control			
68	Slider 7	TGC Slider Control			
69	Slider 8	TGC Slider Control			
70	UI Brake	Rotation/Translation of the Control Console (User Interface)			
71	Trackball button	left trackball key			
72	Trackball button	upper trackball key			
73	Trackball button	right trackball key			

BT Version: Please observe location of these 3 hardkeys on the control console (depend on BT-version).

BT06



BT08



Section 5-7
Monitor

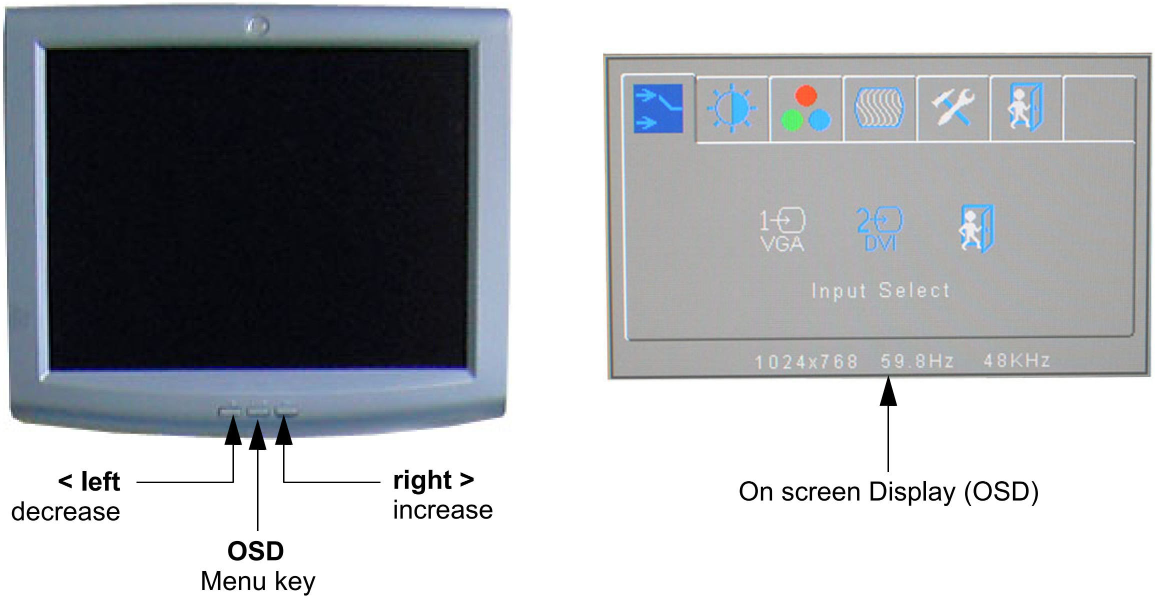


Figure 5-28 Monitor Adjustment buttons

- **Menu key [OSD]:**
  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

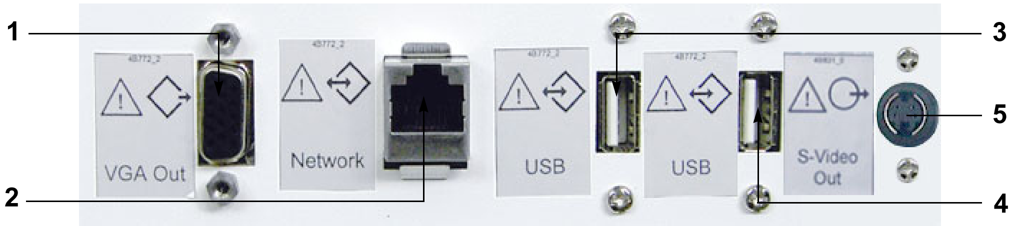


Figure 5-29 External I/O Connectors - on Rear of System (GES)

Item	Connector Name	Description
1	VGA OUT	Connector for external Monitor
2	NETWORK	DICOM input/output, twisted pair RJ-45 10/100 megabit/s
3	USB	USB-2.0 port
4	USB	USB-2.0 port
5	S-Video OUT	S-Video OUT connector (**not** available at GES14)

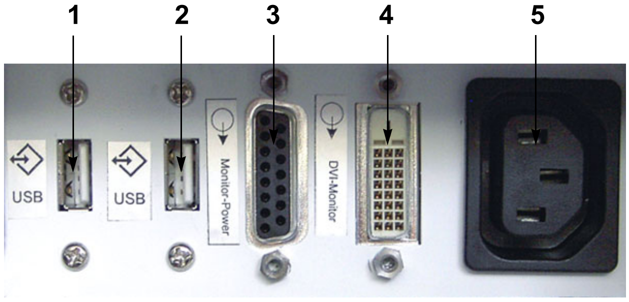


Figure 5-30 External I/O Connectors - on Back of Console

Item	Connector Name	Description
1	USB	USB-2.0 port
2	USB	USB-2.0 port
3	Monitor Pwr	Monitor Power
4	DVI	Monitor DVI (Digital Visual Interface)
5	AUX	main outlet for auxiliary devices

Figure 5-31 External I/O Connectors - next to DVD Drive

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 3-72.*

Section 5-9
Peripherals

5-9-1 Recording Tools

5-9-1-1 Videocassette Recorder (VCR)

The VCR is controlled from the units front panel. Operation is completely independent of the Voluson® E8 system. One must obtain the appropriate Recorder Type and Video Norm (PAL or NTSC) in accordance with the regional standards.

To obtain the maximum image quality it is recommended to use S-VHS video tapes.

5-9-1-2 DVD Recorder

The DVD recorder is controlled from the units front panel. Operation is completely independent of the Voluson® E8 system. One must obtain the appropriate Recorder Type, Video Norm (PAL or NTSC) and Region Code in accordance with the regional standards.

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® E8 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® E8 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. It is controlled by the BEP via the USB port.

5-9-4 ECG-preamplifier (MAN6 - optional)

The ECG-preamplifier is used for acquiring an ECG-signal to be displayed with the ultrasound image. This optional peripheral serves for gaining an ECG-signal to mark the systolic and end diastolic moments in M-Mode and Doppler evaluations.

The ECG-preamplifier must not be used for ECG-diagnostics. It is not intended for use as a cardiac monitor and must not be used for an intra-operative application on the heart.

5-9-5 Wireless Network Adapter

The Voluson® E8 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 3-5-7 "Connecting the Wireless Network Adapter" on page 3-38.

The Wireless Network USB Adapter provides a mobile network connection to the local area network.

5-9-6 Footswitch

The Footswitch is used for comfortable system control when no hand is free.
To adjust function of the Footswitch (Left/Right) see: Section 3-8-1-8 on page 3-69.

Section 5-10
Power Distribution

5-10-1 RTN - Primary Power Module (AC/AC)

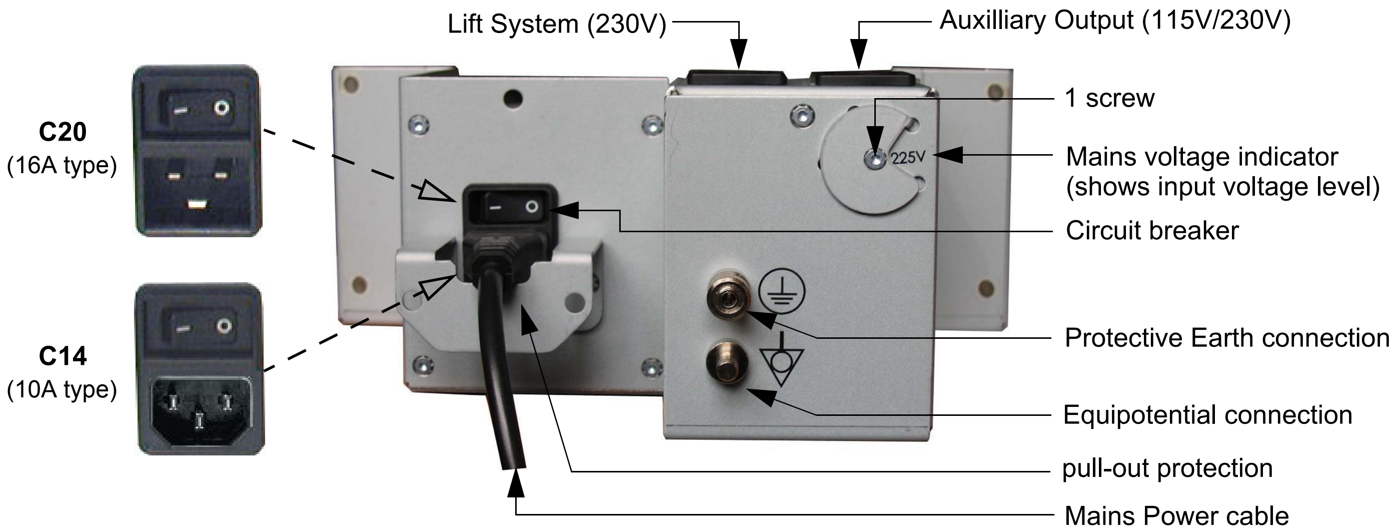


Figure 5-32 Primary Power Module - RTN

5-10-1-1 Mechanical Concept and Overview

The AC Power's main tasks are to supply the various internal subsystems with AC power and to galvanically isolate the scanner from the on site Mains Power System. To reduce inrush current, an inrush current limiter is implemented.
Voltage to peripherals can be configured to either 115 VAC or 230 VAC.

From the Mains Power Input module, the AC power is routed via an Inrush Current Limiter to an internal outlet connector for the Mains Transformer.

NOTICE The Mains Power Input Connector may vary (depending on the Primary Power Module version).
- **RTN2**: Connector **C20** (16A type) is installed by default; no possibility to change to C14 (10A type)
- **RTN3, 4, 5:** Connector **C14** (10A type) is installed by default; C20 (16A type) is part of the part kit
  Note: If the Mains Voltage is lower than 200V, Connector C20 has to be installed!

5-10-1-2 Major Functions of RTN

- Inrush Current limiter
- The RTN Primary Power Supply module generates 34.5VAC (+/-2V) as an input voltage for the Secondary Power Supply module (RTP).
- The RTN module contains also the isolation transformer for the peripherals (AUX). (Maximum load: 345VA) see: Basic User Manual, Technical Data/Information

NOTE: All DC-supply voltages for built in peripherals are generated in RTP-module not inside RTN.

NOTICE The systems mains supply input voltage can be set to: 100V, 115V, 125V, 225V and 250V. Modifications of voltage settings has to be done by an authorized service person only!
The output voltages may be set to 115VAC or 230VAC (independent from the input voltages).

*NOTE: The "Mains voltage indicator" on the RTN primary power supply should be set in accordance to the input voltage level. This indicator is **NOT** a voltage selection switch!*

5-10-1-3 Fuses of RTN

NOTE: All fuses are inside the Primary Power Supply module (RTN) and can not be exchanged by the user.

5-10-2 RTP - Secondary Power Supply (AC/DC)

5-10-2-1 Overview

From the 34.5 VAC input voltage from the primary power supply (RTN) the AC/DC device (RTP) generates all system supply voltages. This are:

- Front end voltages
- Standby voltage
- ATX motherboard supply
- Tx voltages
- Fan supply

In addition, the AC/DC device contains the digital motor amplifier.

Section 5-11
Mechanical Descriptions

5-11-1 Physical Dimensions

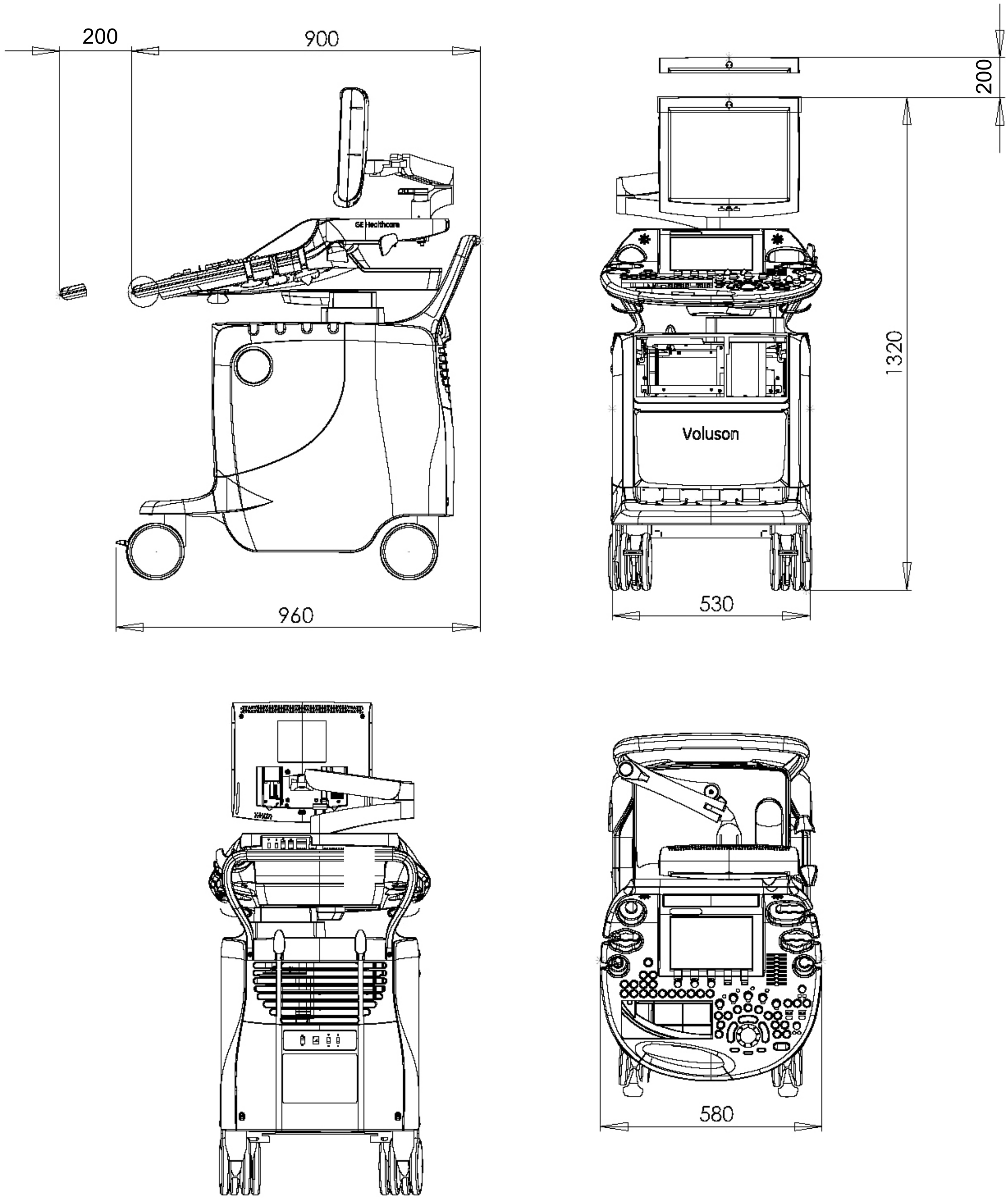


Figure 5-33 Physical Dimensions

5-11-2 LCD Monitor

The Voluson® E8 has a free adjustable LCD monitor in relation to the user interface.

- position up/down: +/- 5 cm
- position left/right: +/- 20 cm
- rotation up/down: 30°/10°
- rotation left/right: +/- 45°

5-11-3 Control Console Positioning

The control console can be rotated, translated and adjusted in height.

- height adjustment: 20 cm (7.8 inch)
- translation adjustment: 20 cm (7.8 inch)
- rotation adjustment: +/- 40°

Figure 5-34 adjustable Control Console

5-11-3-1 Rotation/Translation of the Control Console

Press the **BRAKE** button in the inside of the handlebar opening to rotate/translate the console to the desired position.
Press the **BRAKE** button again in order to secure the console against uncontrolled movement.

5-11-3-2 Height Adjustment (Elevation) of the Control Console

Control console elevation adjustment is done with the **ELEVATION** key on the control panel.
As long as this key is pressed, the control console can be elevated by means of the UP and DOWN button displayed on the Touch Panel.

Section 5-12
Air Flow Control

5-12-1 Air Flow Distribution

Through the filter grid on the back of the system (Main Air Inlet), air flow into the Voluson® E8 scanner.

- Air holes in the RTP secondary power supply allow the air to pass through; the 3 fans (between RTP and Beamformer) suck in the air and spread it through the beamformer and around the RFI board.
- By means of the 2 Backend fans, air is blown through the GEB-box (along its internal components and the PC- Motherboard).

The warm air exits the scanner through holes in the left side panel (Main Air Outlet).

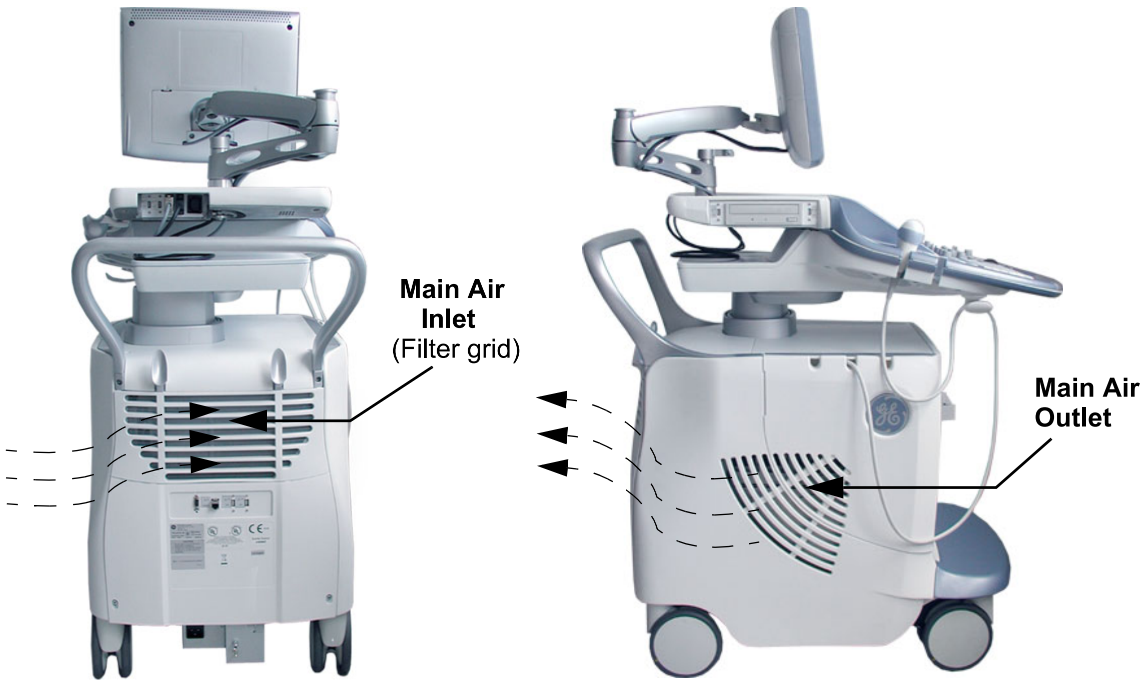


Figure 5-35 Main Air Inlet/Outlet at Voluson® E8

Section 5-13
Service Platform

5-13-1 Introduction

The Service Platform will increase service productivity and reduce training and service costs.

5-13-2 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
- *Remote Access*: This offers GE technicians the possibility to view the entire customer´s desktop and operation system. Remote access to the Voluson® E8 scanner requires permission and customer input to run diagnostics.

5-13-2-1 Local Access

1.) If not already in read mode, **FREEZE** the image.
2.) Press the **UTILITIES** key on the control panel and touch 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 GEMS Service Home Page appears, select “Operator” from the pull-down menu, enter the password uls and then click [Okay]

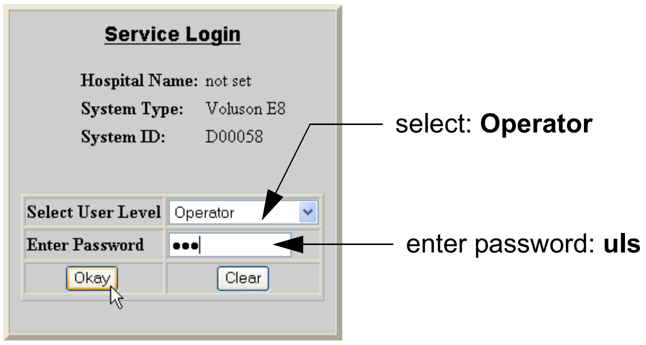


Figure 5-36 Service Login

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 5-14 on page 5-61.

5-13-2-2 Remote Access

This offers GE technicians the possibility to view the entire customer´s desktop and operation system. Remote access to the Voluson® E8 scanner requires permission and customer input to run diagnostics.

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 7-9.

ONLY registered GE Service personal have access to this feature.

NOTE: Be sure the Voluson® E8 is connected to the Internet and service platform is configured properly.

If a GE Service technician requests remote access to your Voluson® E8 scanner, activate the service platform as described below.

1.) If not already in read mode, **FREEZE** the image, then press the **UTILITIES** key on the control panel.
2.) In the “Utilities” menu touch SYSTEM SETUP to invoke the setup desktop on the screen.
3.) On the left side of the screen select ADMINISTRATION and then click on the **SERVICE** tab.
4.) Enter the password SHE and click the ACCEPT button.

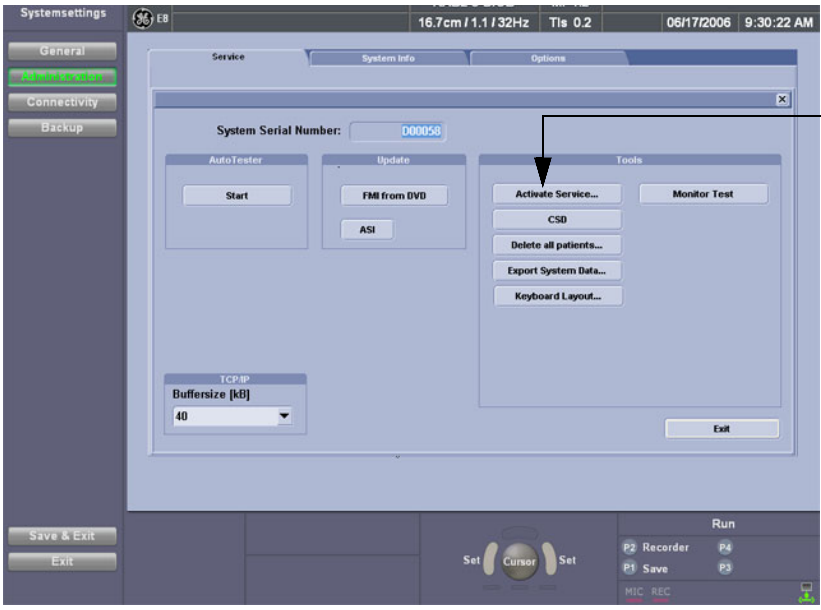


Figure 5-37 Service Tools window

5.) Click on the ACTIVATE SERVICE button. (The button changes to DEACTIVATE SERVICE.)

NOTE: Visual information about the network status is shown in the status area on the right side of the screen.

GREEN = DEACTIVATED
Remote Service Access

BLUE = ACTIVATED
Remote Service Access

Figure 5-38 Remote Service Access - Network Status Icon

Section 5-14
Common Service Desktop (CSD)

5-14-1 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.) *Remote Access* requires customers permission

As soon as the Common Service Desktop (CSD) is started, the Service **[Home]** Page appears.

Figure 5-39 Common Service Desktop - Home

The navigation bar at the top of the screen allows to select from following tools:

- Error Logs on page 5-62
- Diagnostics on page 5-62
- Image Quality on page 5-63
- Calibration on page 5-63
- Configuration on page 5-63
- Utilities on page 5-64
- Replacement on page 5-64
- PM on page 5-64

5-14-2 Error Logs

When the **Error Logs** page is selected, different log viewing options are available.
Log Viewer is displayed in a separate window.

5-14-3 Diagnostics

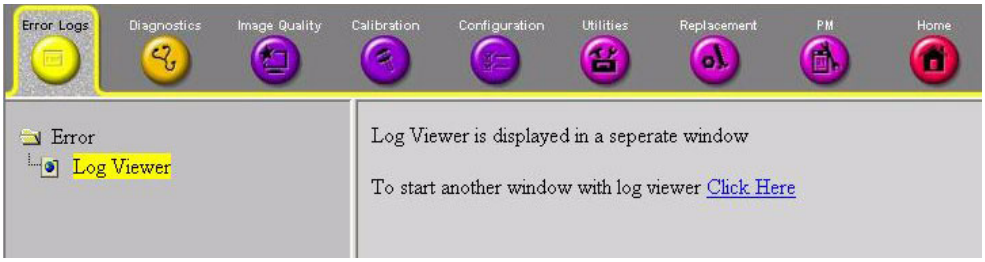


Figure 5-40 Common Service Desktop - Error Logs

The **Diagnostic** page uses a web-controlled user interface to provide access to common service components and perform diagnostics. There are two types of “Common 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.

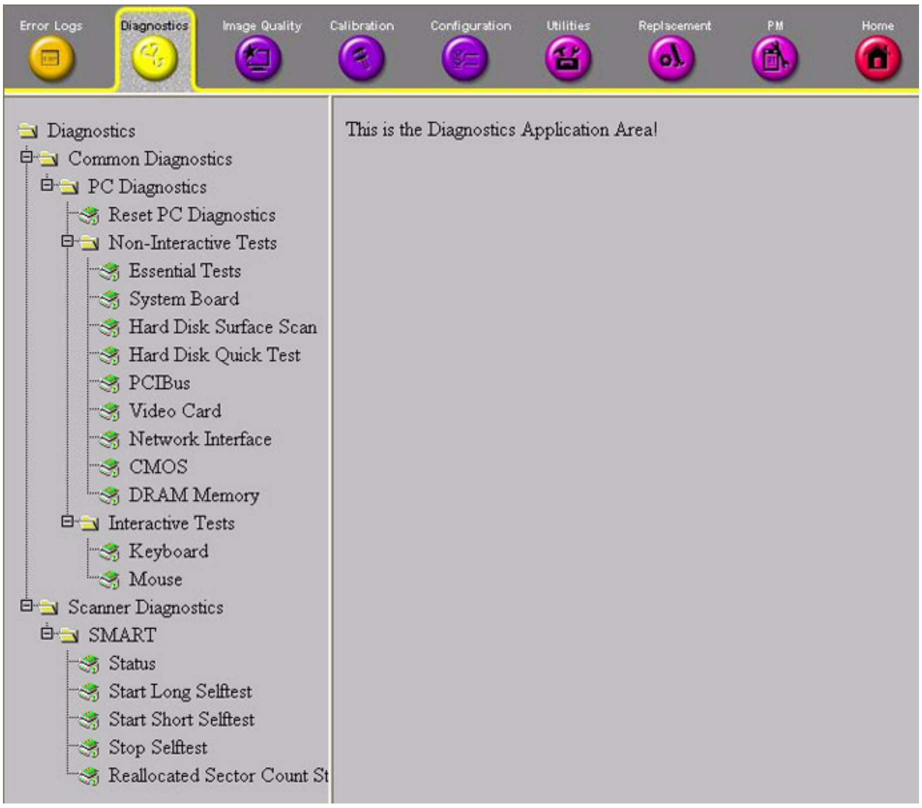


Figure 5-41 Common Service Desktop - Diagnostics

5-14-4 Image Quality

In the **Image Quality** page, you can verify image quality.

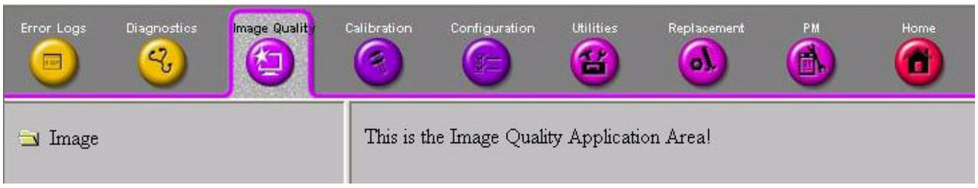


Figure 5-42 Common Service Desktop - Image Quality

NOTE: This **page is not populated** in this version.

5-14-5 Calibration

In the **Calibration** page, you can perform Touch Panel Calibration.

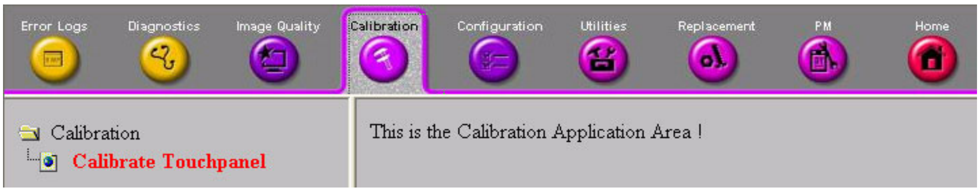


Figure 5-43 Common Service Desktop - Calibration

5-14-6 Configuration

In the **Configuration** page, you can view and modify different device informations and configurations. in the “Questra Agent Configuration” option field.

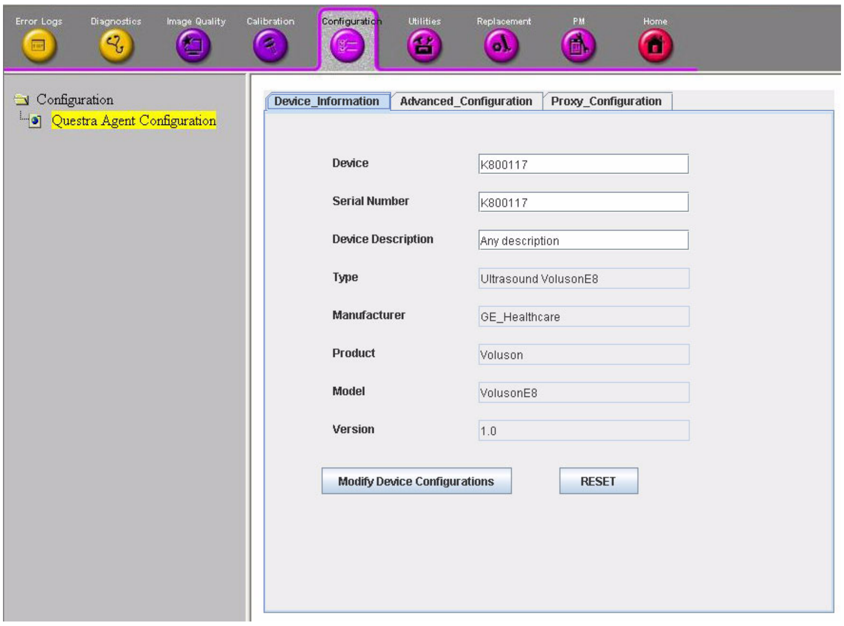


Figure 5-44 Common Service Desktop - Configuration

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 7-9.

5-14-7 Utilities

The **Utilities** page contains a variety of Windows utility tools to indicate the status of the system, in addition to various other tools.

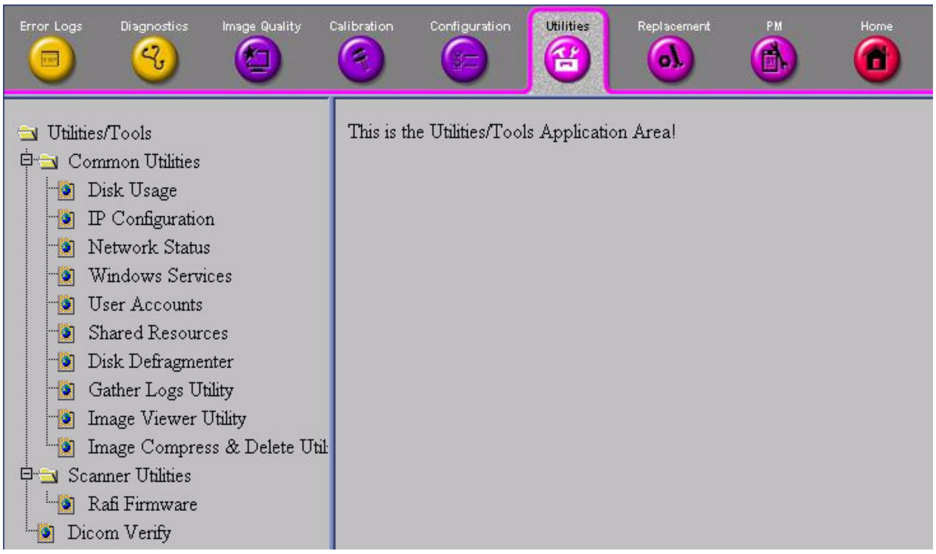
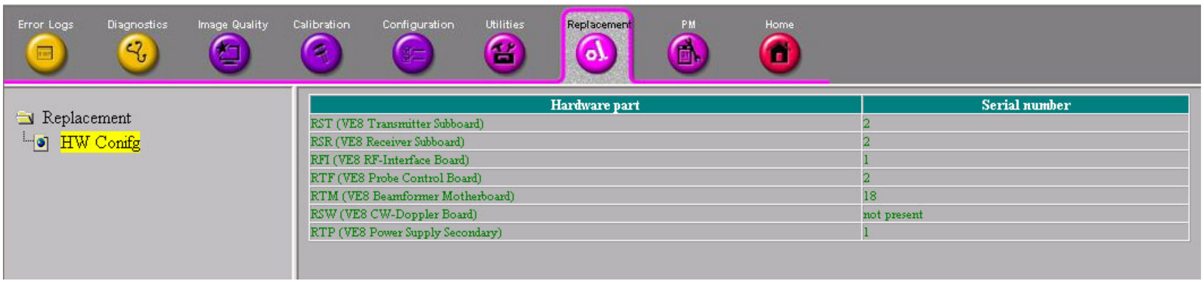


Figure 5-45 Common Service Desktop - Utilities

5-14-8 Replacement

In the **Replacement** page, Hardware parts and Serial numbers are displayed.



Hardware part	Serial number
RST (VE8 Transmitter Subboard)	2
RSR (VE8 Receiver Subboard)	2
RFI (VE8 RF-Interface Board)	1
RTF (VE8 Probe Control Board)	2
RTM (VE8 Beamformer Motherboard)	18
RSW (VE8 CW-Doppler Board)	not present
RTP (VE8 Power Supply Secondary)	1

Figure 5-46 Common Service Desktop - Replacement

5-14-9 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 5-47 Common Service Desktop - PM

NOTE: This **page is not populated** in this version.

Section 5-15
Service Page

5-15-1 Introduction

The Service Page contains specific software/hardware test modules, system setup, update, etc. for Voluson systems only.

5-15-2 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.

5-15-3 Service Login

1.) Press the **UTILITIES** key on the control panel.
2.) In the “Utilities” menu touch 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.

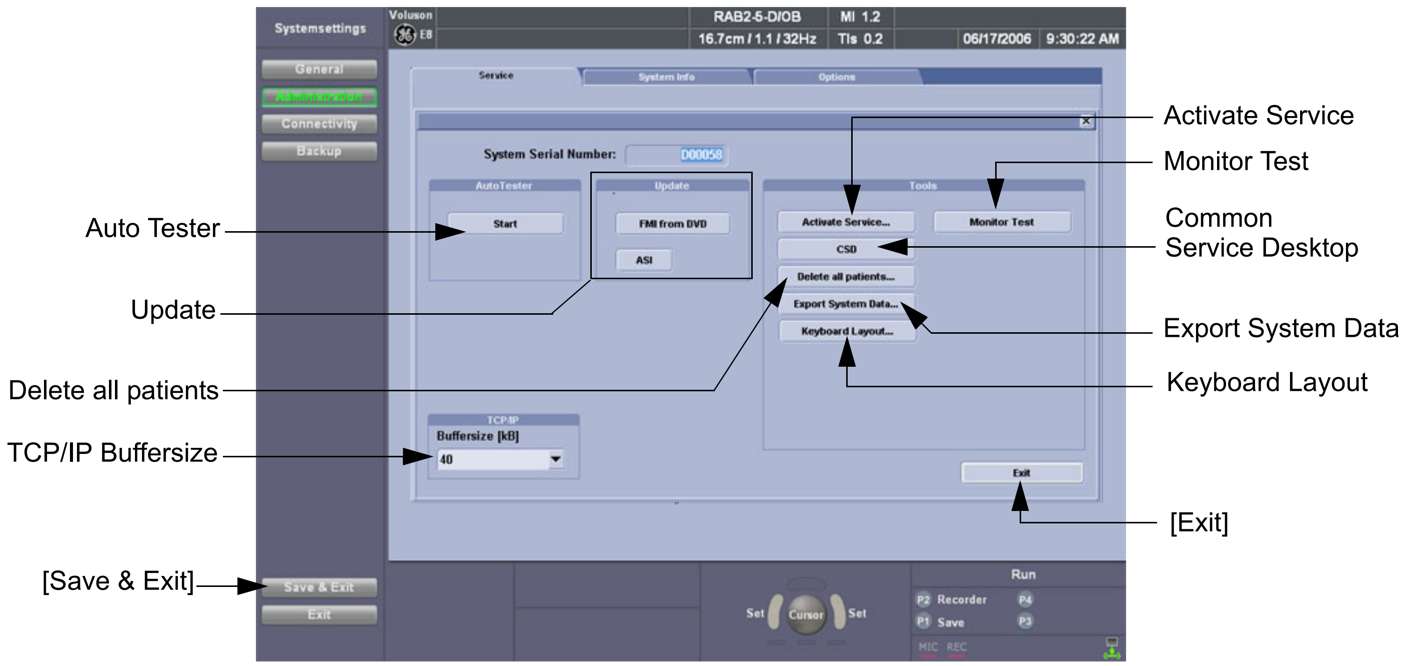


Figure 5-48 Service Tools window

5-15-3-1 Auto Tester

Autotester is a log function of customer activities. It records all user actions (scanning, Touch Panel 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 7-10.

5-15-3-2 Update

5-15-3-2-1 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 5-16-1-3 on page 5-69.*

5-15-3-2-2 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.

5-15-3-3 TCP/IP Buffersize

The TCP/IP Buffersize selects the amount of buffer memory used for DICOM transfers (both directions).

5-15-3-4 Activate / Deactivate Service...

This offers GE technicians the possibility to view the entire customer´s desktop and operation system. Remote access to the Voluson® E8 scanner requires permission and customer input to run diagnostics.

If a GE Service technician requests remote access to your Voluson® E8 scanner, activate the service platform as described in Section 5-13-2-2 on page 5-60.

5-15-3-5 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 5-13-2 on page 5-59.

5-15-3-6 Delete all Patients

1.) Click the DELETE ALL PATIENTS... button. Following WARNING message appears on the screen.

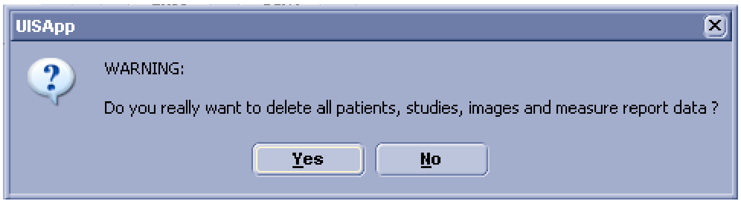


Figure 5-49 Warning message

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!***

5-15-3-7 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 7-5.

5-15-3-8 Keyboard Layout

To change the keyboard layout to different languages.
Operation see: Section 6-6 "Modification of Keyboard Layout" on page 6-10.

NOTE: Reconfigure the layout of the keyboard is only useful by changing the concerned keys also. see: Section 8-13 "Replacement of Key Caps (by special native language keys)" on page 8-20

5-15-3-9 Monitor Test

Select the MONITOR TEST button to perform color calibration.
Operation see: Section 6-3 "LCD Monitor Adjustment" on page 6-2.

Section 5-16
Boot Screen Functions

5-16-1 Overview

Following LINUX supported functions are available as soon as the "Boot Screen" appears:

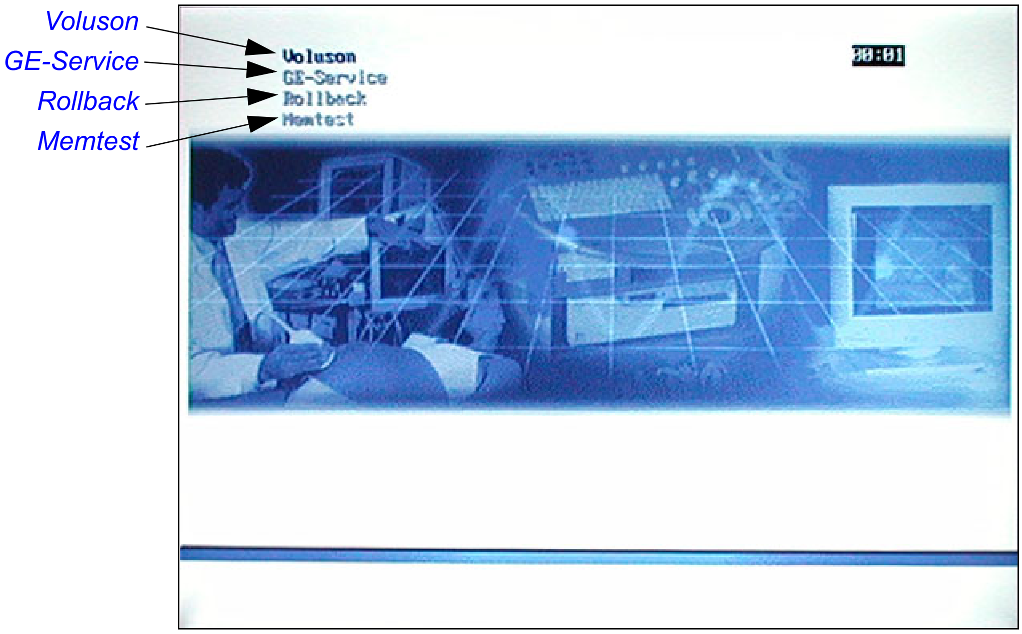


Figure 5-50 Boot screen

NOTICE After 3 sec. without pressing any key, the system will boot-up in windows (= **Voluson** item).

5-16-1-1 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 3-49.

5-16-1-2 GE-Service

This function MUST NOT be used by the customer!

5-16-1-3 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 5-50 on page 5-68), 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**.

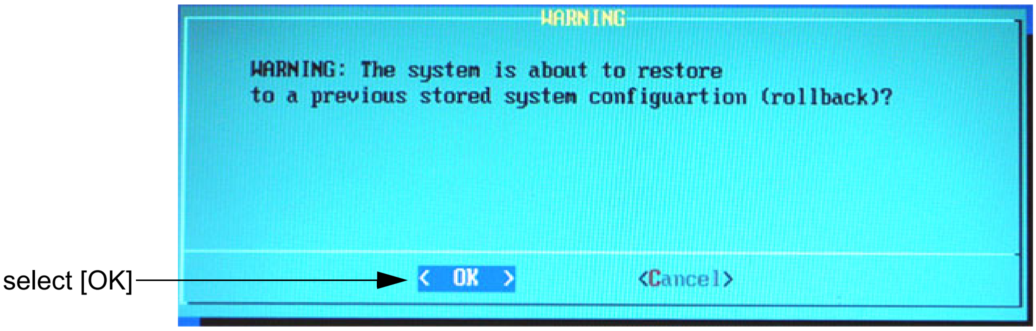


Figure 5-51 Warning message

After performing the rollback, the system reboots.
The Ultrasound Application is started and finally the 2D screen is displayed on the monitor.

5-16-1-4 Memtest

Starts the PC Memory Test.
Operation see: Section 5-16-2 "Memory Check in LINUX" on page 5-70.

5-16-2 Memory Check in LINUX

1.) Turn system OFF and then back ON.

2.) As soon as the “Boot Screen” appears (see: Figure 5-50 on page 5-68), 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 2.5 hours.
If there are errors they will be listed.

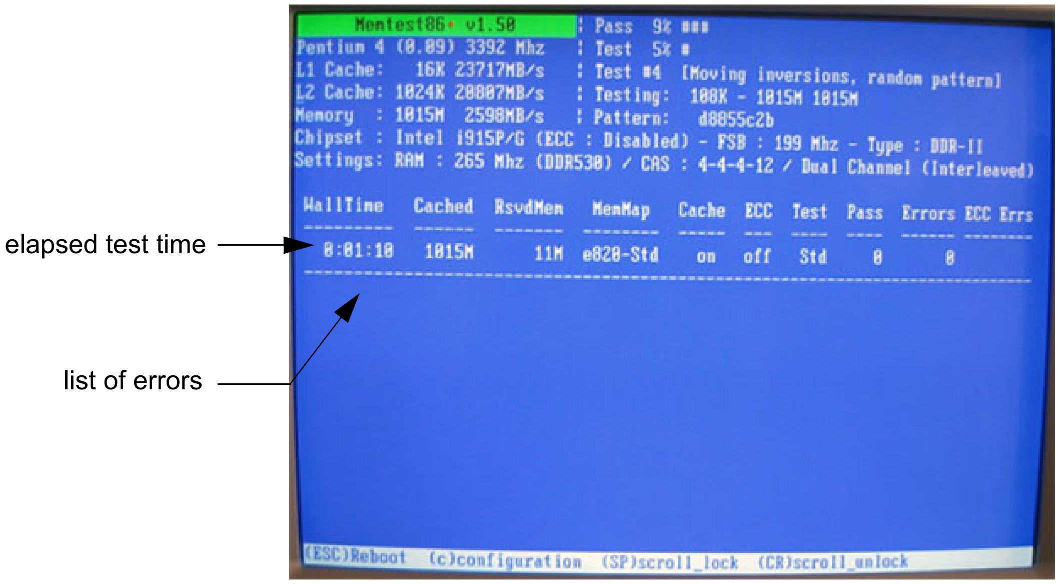


Figure 5-52 Memory check in LINUX

NOTICE After one cycle (~ 2.5 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 2.5 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® E8 has a free adjustable LCD monitor in relation to the user interface.

- position up/down: +/- 5 cm
- position left/right: +/- 20 cm
- rotation up/down: 30°/10°
- rotation left/right: +/- 45°

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.

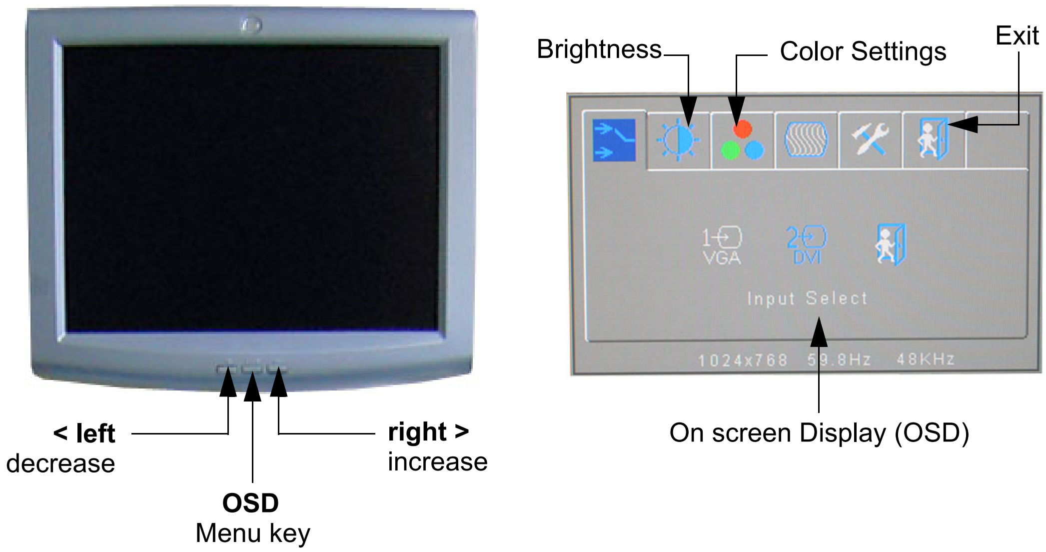


Figure 6-1 Monitor Adjustment buttons

6-3-1 Brightness/Contrast

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 highest white should be bright, but not saturated.

NOTE: *Brightness and Contrast should be adjusted at examination room light conditions.*
Typically values for Contrast = 127 , Brightness = 125 (depending on the operator).

1.) Press the **MENU** (middle) key (see: Figure 6-1 above) of the monitor controls (= toggle button for contrast and brightness).
2.) Adjust the BRIGHTNESS by pressing the **< LEFT** or **RIGHT >** button to decrease/increase value.
3.) Press the **MENU** key again to toggle to brightness.
4.) Adjust the CONTRAST by pressing the **< LEFT** or **RIGHT >** button to decrease/increase the value.

6-3-2 Backlight Brightness

1.) Press the **MENU** (middle) key (see: Figure 6-1 on page 6-2) of the monitor controls for at least 5 seconds. The expanded OSD menu opens.

2.) Press **RIGHT >** button repeatedly until the menu item „Brightness“ is marked, then press the **MENU** (middle) key to change into the menu.

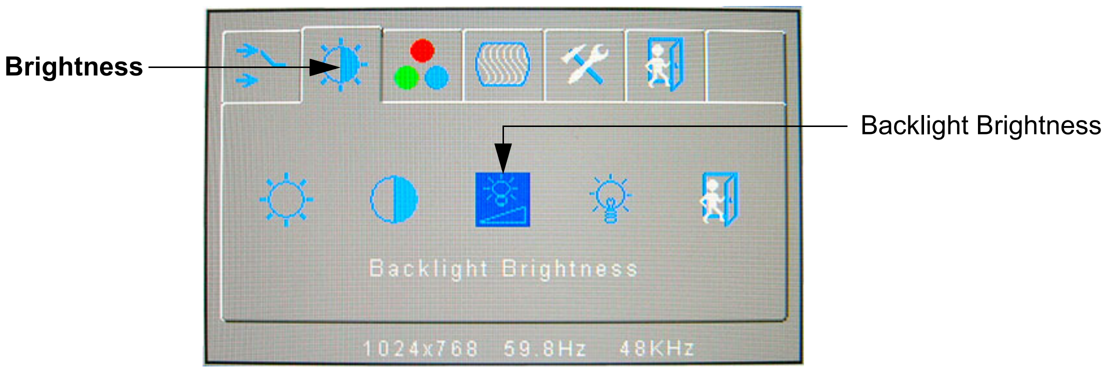


Figure 6-2 Backlight Brightness

3.) Now press the **RIGHT >** button to mark „Backlight Brightness“, then press the **MENU** (middle) key to change into the menu.

4.) Adjust Backlight Brightness to [0].

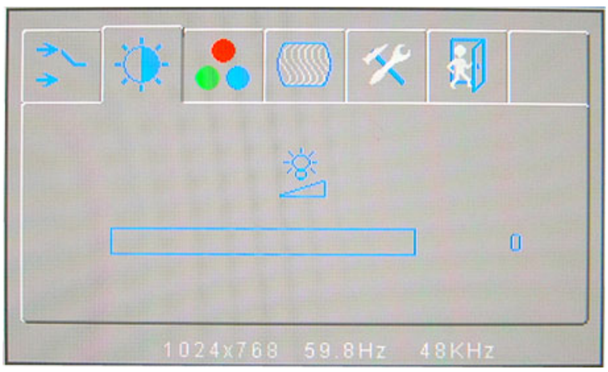


Figure 6-3 Set Backlight Brightness to 0

5.) Afterwards close the OSD menu with the [Exit] icon. Therefore use the **< LEFT** or **RIGHT >** button to mark the [Exit] icon and then press the **MENU** (middle) key to leave the menu.
Repeat that action till the OSD menu is closed.

6-3-3 Color Temperature

1.) Press the **MENU** (middle) key (see: Figure 6-1 on page 6-2) of the monitor controls for at least 5 seconds. The expanded OSD menu opens.

2.) Press **RIGHT >** button repeatedly until the menu item „Color Settings“ is marked, then press the **MENU** (middle) key to change into the menu.

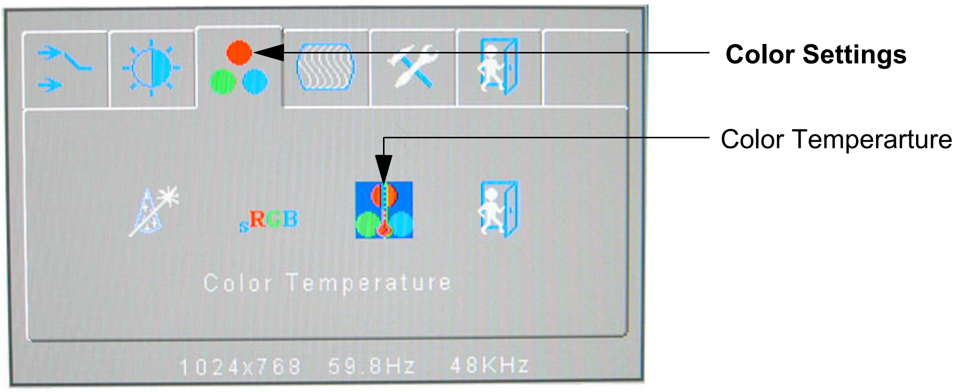


Figure 6-4 Color Settings

3.) Now press the **RIGHT >** button to mark „Color Temperature“, then press the **MENU** (middle) key to change into the menu.

The OSD menu should look like the following image (Icon with the 3 color bars on the left is marked):

Figure 6-5 Color Temperature

RED = approx. 25% (160) GREEN = approx. 50% (195) BLUE = approx. 100% (255)

6-3-3 Color Temperature (cont'd)

4.) Using the **< LEFT** or **RIGHT >** button mark the icon with the 3 color bars. Following menu appears:

Figure 6-6 Color temperature value (R: 160, G: 195, B: 255)

5.) Step through the color bars by pressing the **MENU** (middle) key:
- select RED and adjust value using the **< LEFT** or **RIGHT >** button
- select GREEN and adjust value using the **< LEFT** or **RIGHT >** button
- select BLUE and adjust value using the **< LEFT** or **RIGHT >** button

6.) Pressing the **MENU** (middle) again till the OSD menu switches back to the "Color Temperature" menu (see: Figure 6-5 above).

7.) Afterwards close the OSD menu with the [Exit] icon. Therefore use the **< LEFT** or **RIGHT >** button to mark the [Exit] icon and then press the **MENU** (middle) key to leave the "Color Settings" menu. Repeat that action till the OSD menu is closed.

6-3-4 Color Calibration

1.) Press the **UTILITIES** key on the control panel.
2.) In the "Utilities" menu touch 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.) Select the SERVICE page, enter the password SHE and click the ACCEPT button.
5.) Select the MONITOR TEST button in the "Service Tools" menu.
6.) Confirm the "Monitor Test" message with YES.

The Monitor Test main menu appears on the screen.

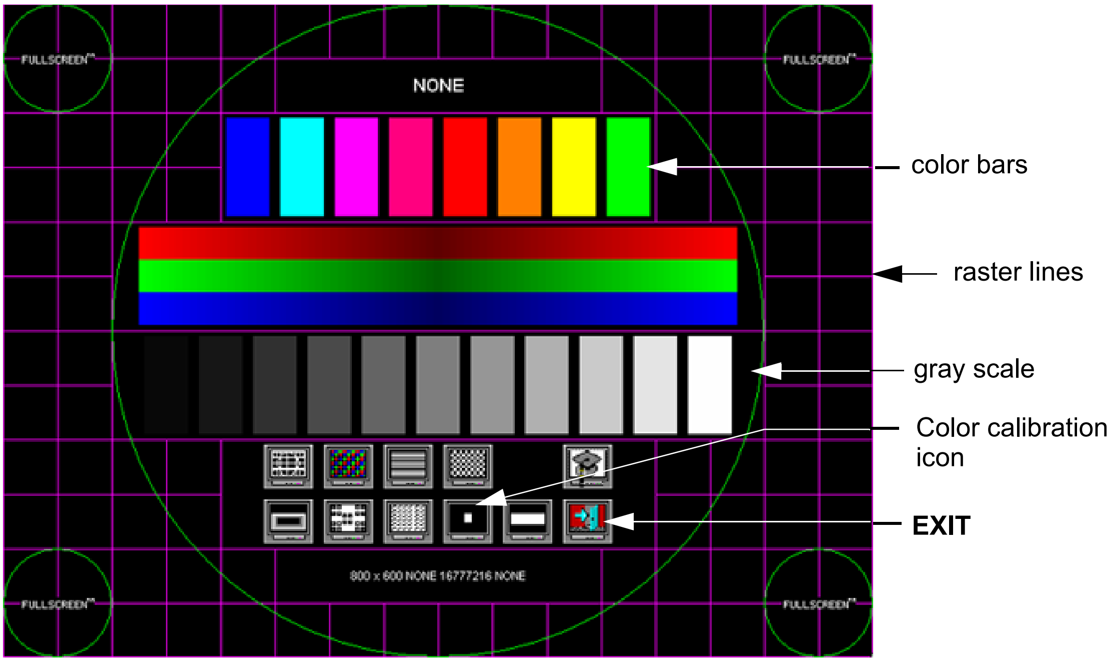


Figure 6-7 Monitor Test - Main menu

7.) Select the "Color calibration" icon and press the **right/left trackball** (screen becomes white).
   - WHITE is displayed without any tint (discolor) or colored pixels.
8.) Press the **right/left trackball** key repeatedly to step through RED, GREEN and BLUE.
   - Each color is displayed correctly (without any tint or discolored pixels).
9.) To return to the Main menu, press the **upper trackball** key.
10.) To exit the Monitor Test program, press **EXIT**.

Section 6-4
Monitor Arm Adjustment

1.) If the arm with mounted monitor moves self-acting, retighten the Allen screw on the upper part of the monitor arm.

2.) If the monitor tilts downward, retighten the cross-head screw on the swivel head of the monitor arm.

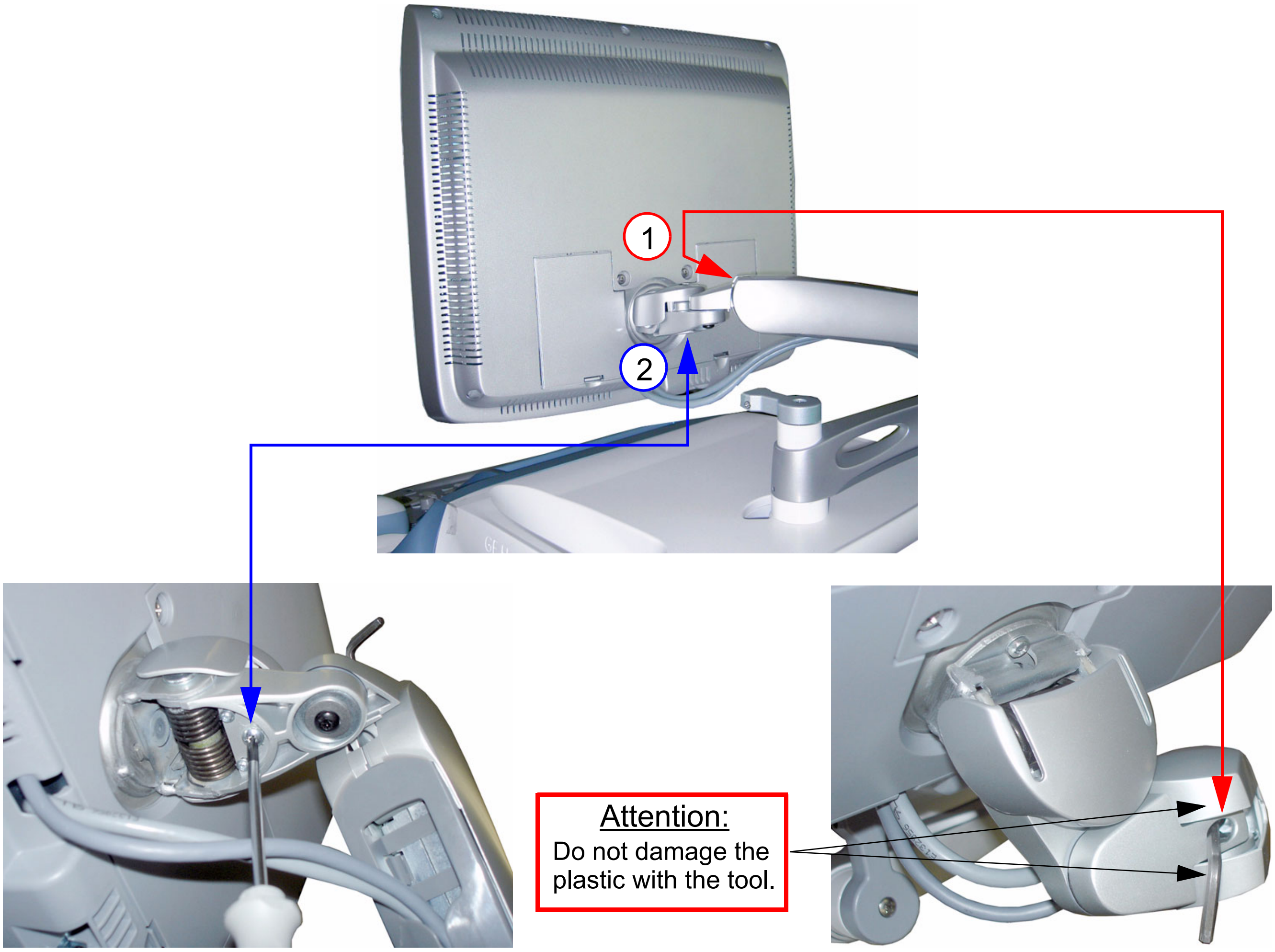
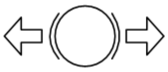


Figure 6-8 retighten screws

Section 6-5
Control Console Positioning

The control console can be rotated, translated and adjusted in height.

6-5-1 Translation/Rotation Adjustment



Press the BRAKE button on the inside of the handlebar opening.

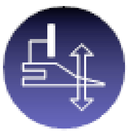
Rotate/translate the console to the desired position.

Figure 6-9 Buttons for Control Console Adjustment

Press the BRAKE button again in order to secure the console against uncontrolled movement.

CAUTION **The system should NOT be moved with the Control Console (UI) extended.**
DO NOT put your hand between the control console and the Main unit when moving the Control Console to its centered and locked position: Danger of injuries!

6-5-2 Height Adjustment (Elevation)



Control console elevation adjustment is done with the ELEVATION key on the control panel.

As long as the ELEVATION key is pressed, the control console can be elevated/lowered by means of the UP or DOWN button displayed on the Touch Panel (soft keys for safety reason).

CAUTION **Make sure that nothing would be jammed while moving!**

6-5-2-1 Moving down the Console - without booting up the System

If it is impossible to boot up the system, the user interface can be moved downwards by pressing 3 keys on the control console

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.
3.) Press 3 keys on the control console simultaneously (see Figure 6-10 below) to move it downwards.

Note:
This key is not labeled at BT06 systems

Figure 6-10 keys to lower the control console

NOTE: Shipping the Voluson® E8 ultrasound system in its original packaging is only possible when the system is lowered to its minimum height with monitor flapped and locked down, and when the control console is centered and locked in position (see Figure on page 3-6).

Section 6-6
Modification of Keyboard Layout

NOTE: *Configuring the layout of the keyboard is only useful by changing the concerned keys also. see: Section 8-13 "Replacement of Key Caps (by special native language keys)" on page 8-20.*

6-6-1 Setup the Voluson® E8 Keyboard Language Layout

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

2.) In the "Utilities" menu touch 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. The "password window" appears automatically.

4.) Enter the password SHE and click the ACCEPT button to display the Service Tools window.

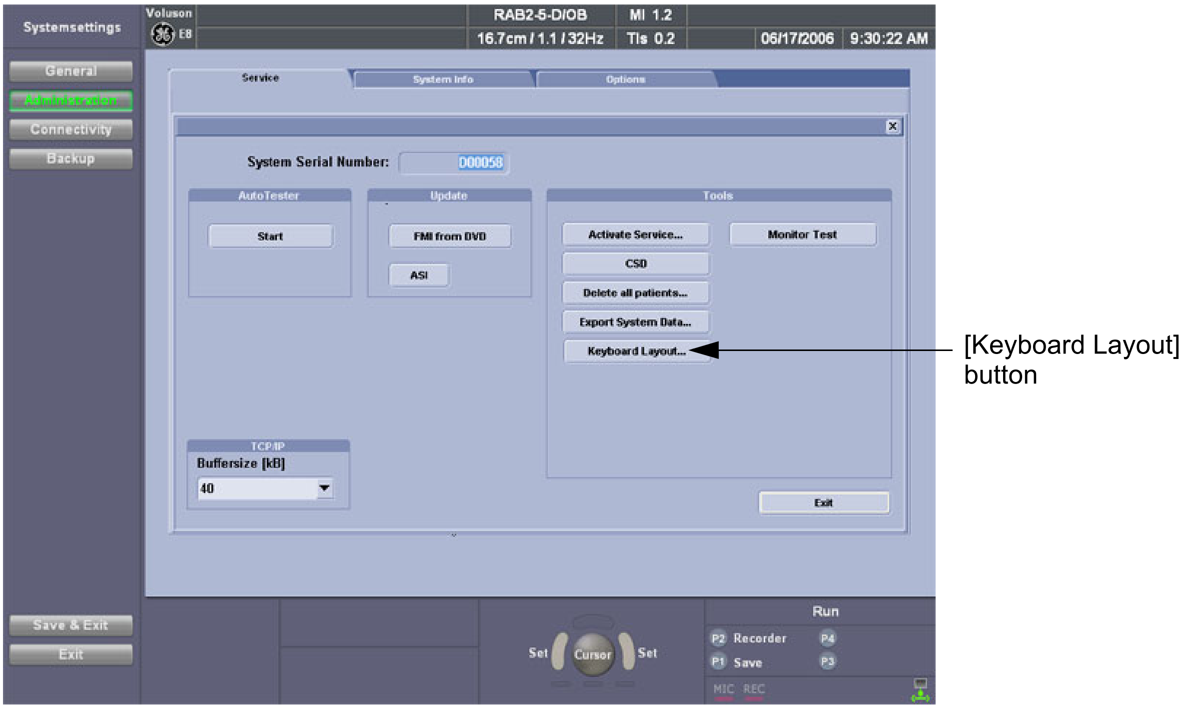


Figure 6-11 Service Tools window

5.) Click on the KEYBOARD LAYOUT button.

Section 6-6 Modification of Keyboard Layout (cont'd)

6.) Select the default input language from the drop down menu.

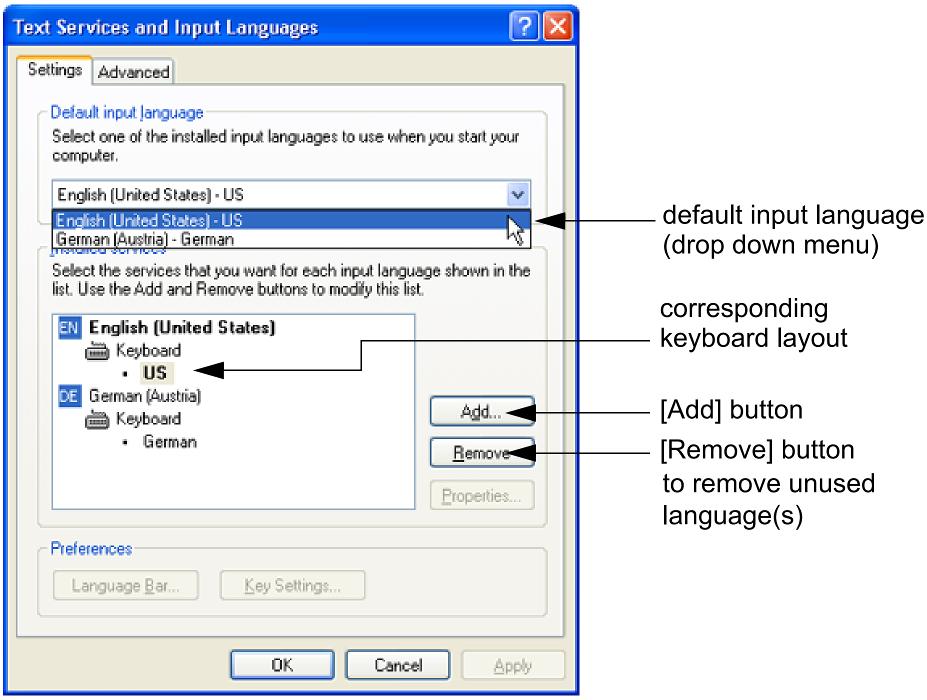


Figure 6-12 Default input language

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 6-13 below, and then confirm with OK. (The corresponding keyboard layout is shown automatically.).*

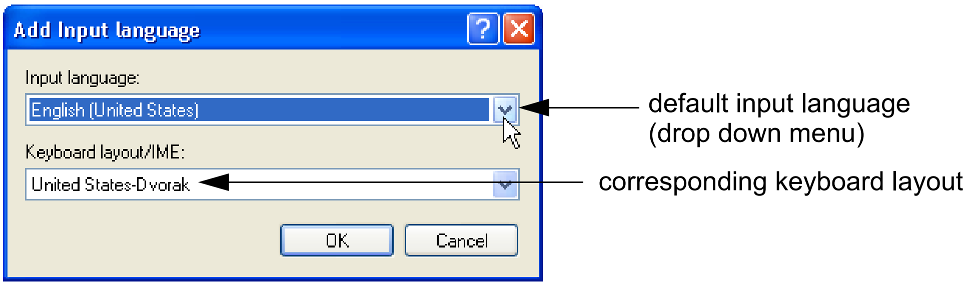


Figure 6-13 Default Keyboard Settings and Input Locale Properties

7.) If not already done, select the default input language from the drop down menu (see: Figure 6-12). 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.

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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 (Insite2) 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 touch 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, “SLOT_CPU” respectively “Mainboard Type”, etc.)

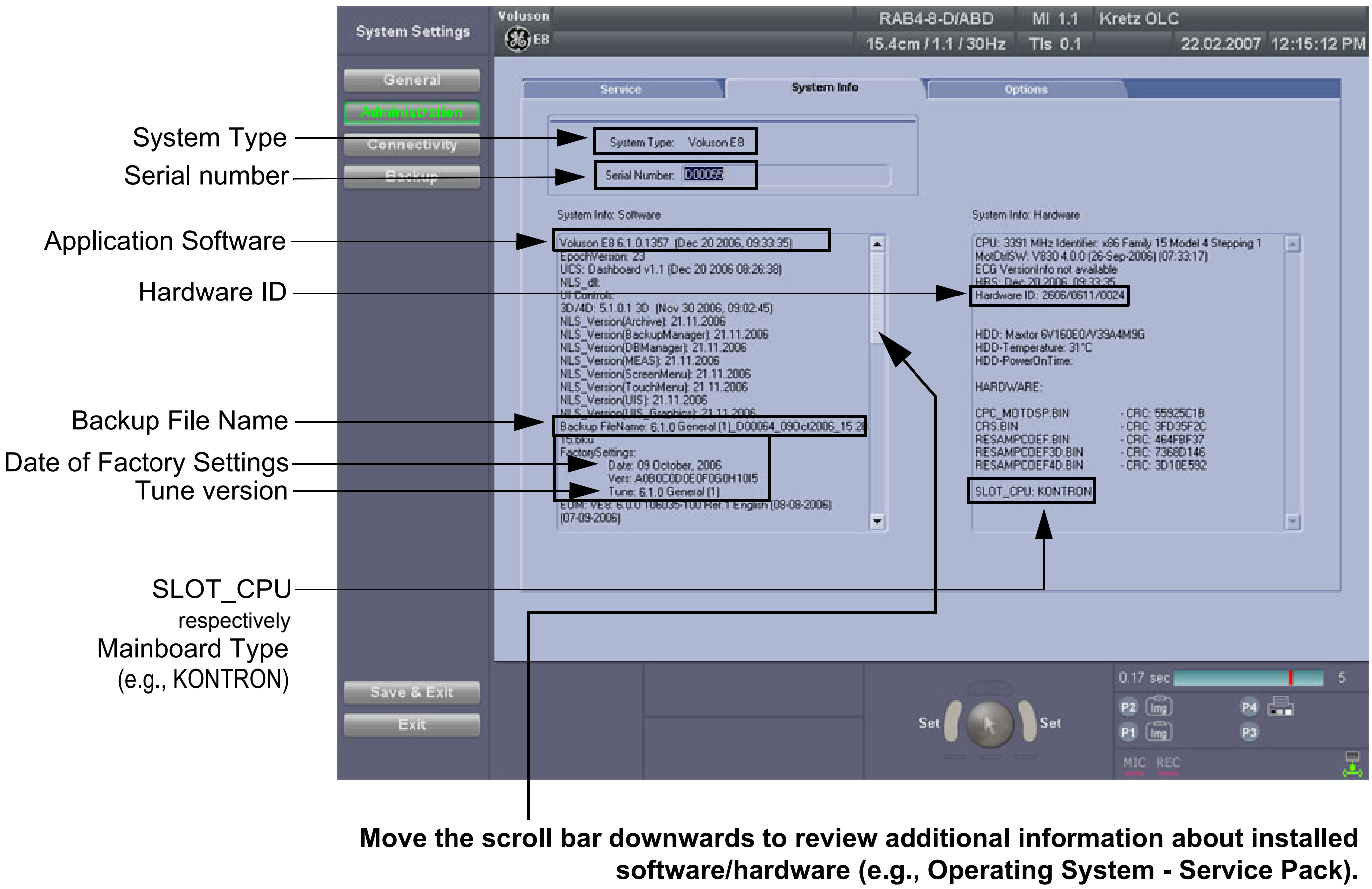


Figure 7-1 System Setup - Administration - SYSTEM INFO page

7-2-1 Shortcuts List

Press the **CTRL** + **H** key simultaneous to display the shortcuts list and a description of what they do.

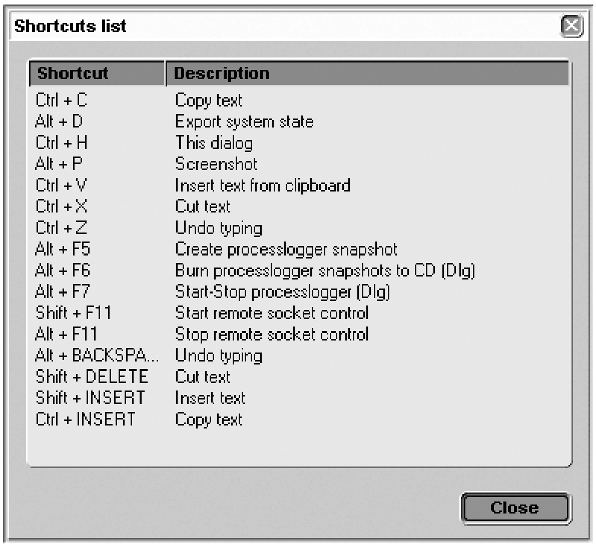


Figure 7-2 Shortcut list (Ctrl + H)

Shortcut	Description
Ctrl + C	copy text
Alt + D	export system state (Full Backup and Dump files) to D:\export
Ctrl + H	shortcuts list (see: Figure 7-2 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 RTN - Primary Power Supply (AC/AC)

Turn on mains switch and check green LED inside RTN.

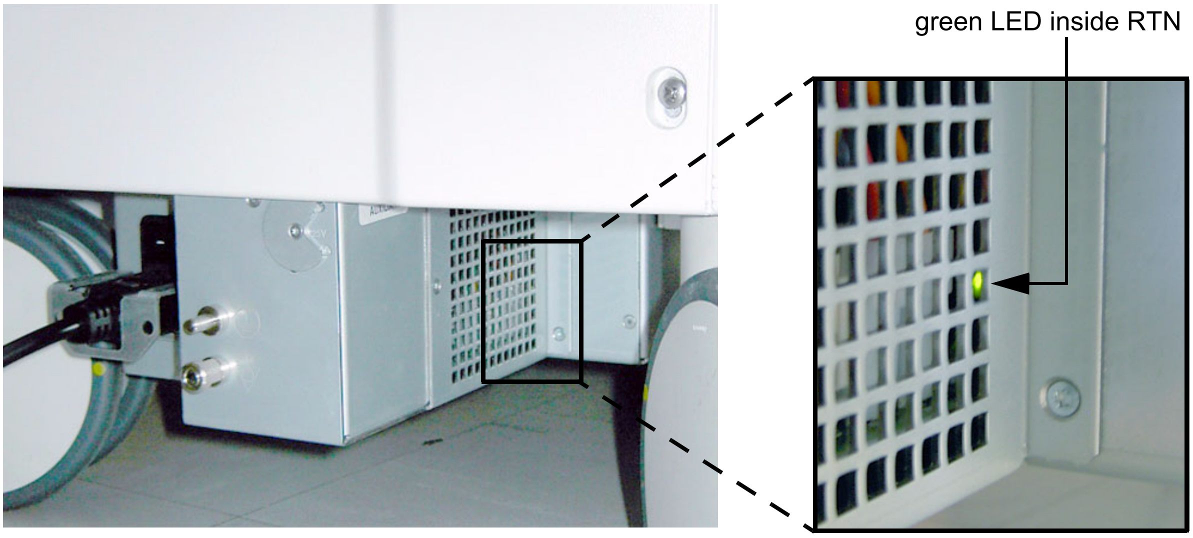


Figure 7-3 check green LED inside RTN

7-3-1-2 RTP - Secondary Power Supply (AC/DC)

Power on the system and check the green LED inside the RTP.

Figure 7-4 check green LED inside RTP

NOTE: If LED is on, RTP 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 on D:\export 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 7-5 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, bmp, tiff or Volume file).

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 7-5

2.) via the EXPORT SYSTEM DATA button in the System Setup - Administration - **SERVICE** page;
see: Section 7-4-2-2 on page 7-7

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 at destination HDD.*

1.) Press the **ALT** + **D** key on the keyboard simultaneously.

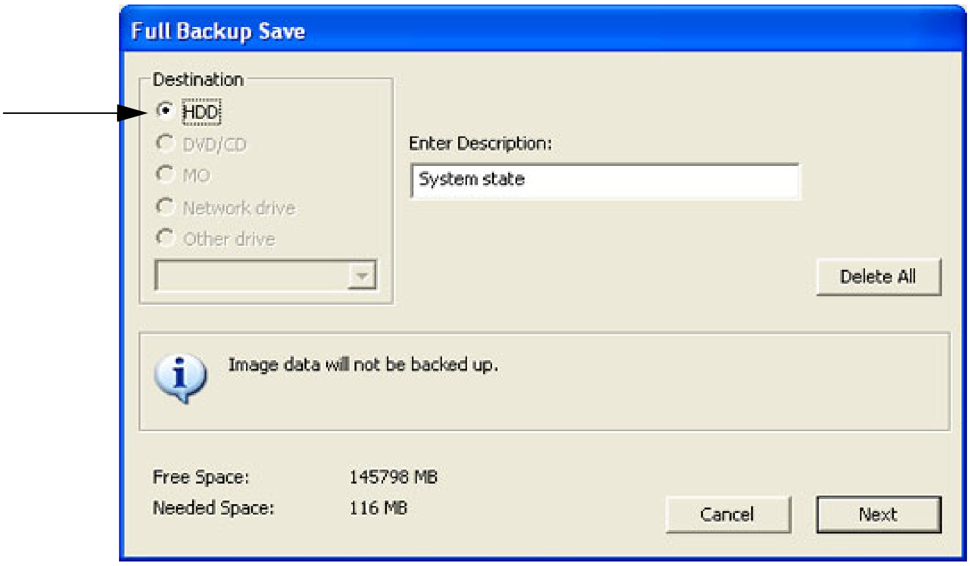


Figure 7-6 select destination for "System state" backup

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® E8 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 touch 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. The “password window” appears automatically.
4.) Enter the password SHE and click the ACCEPT button to display the Service Tools window.

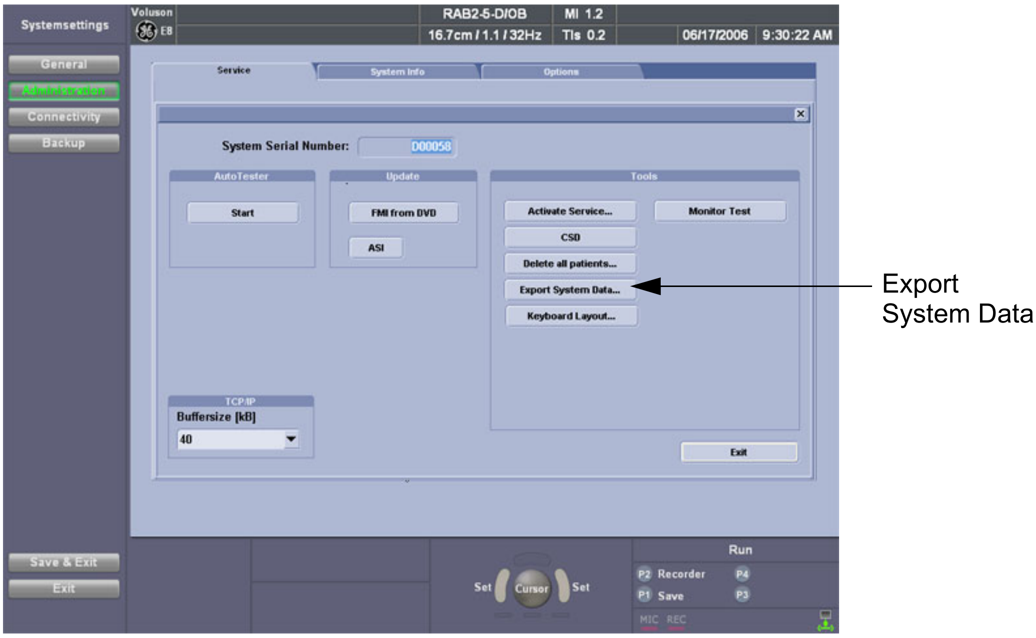


Figure 7-7 Service Tools window

5.) 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 to the DVD Drive.

7-4-2-2-1 Dump-file

Every time an error message like Figure 7-8 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.

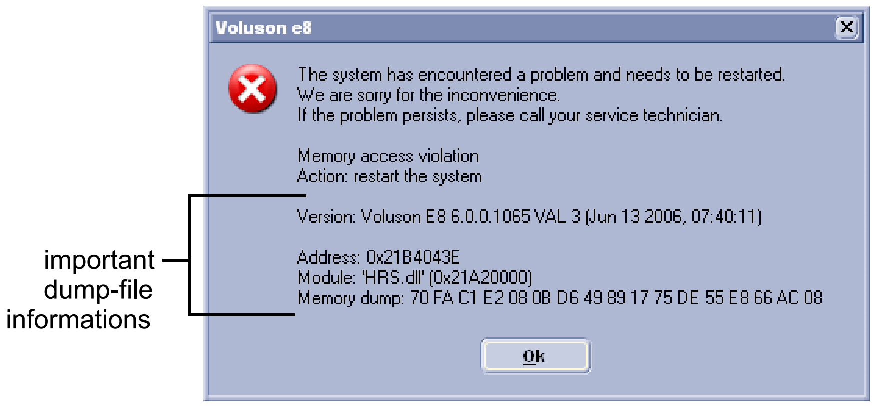


Figure 7-8 system has encountered a problem

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. Remote access to the Voluson® E8 scanner requires permission and customer input to run diagnostics.

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 7-9.

ONLY registered GE Service personal has access to this feature.

7-5-2 Preparations

NOTE: *Be sure the Voluson® E8 is connected to the Internet and service platform is configured properly in the Common Service Desktop - Configuration page.*

If a GE Service technician requests remote access to your Voluson® E8 scanner, activate the service platform as described in Section 5-13-2-2 "Remote Access" on page 5-60.

7-5-3 Common Service Desktop (CSD)

As soon as the Common Service Desktop (CSD) is started, the Service **[Home]** Page appears.

Figure 7-9 Common Service Desktop - Home

NOTE: *As described in Chapter 5 - Common Service Desktop (CSD), on page 5-61, 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

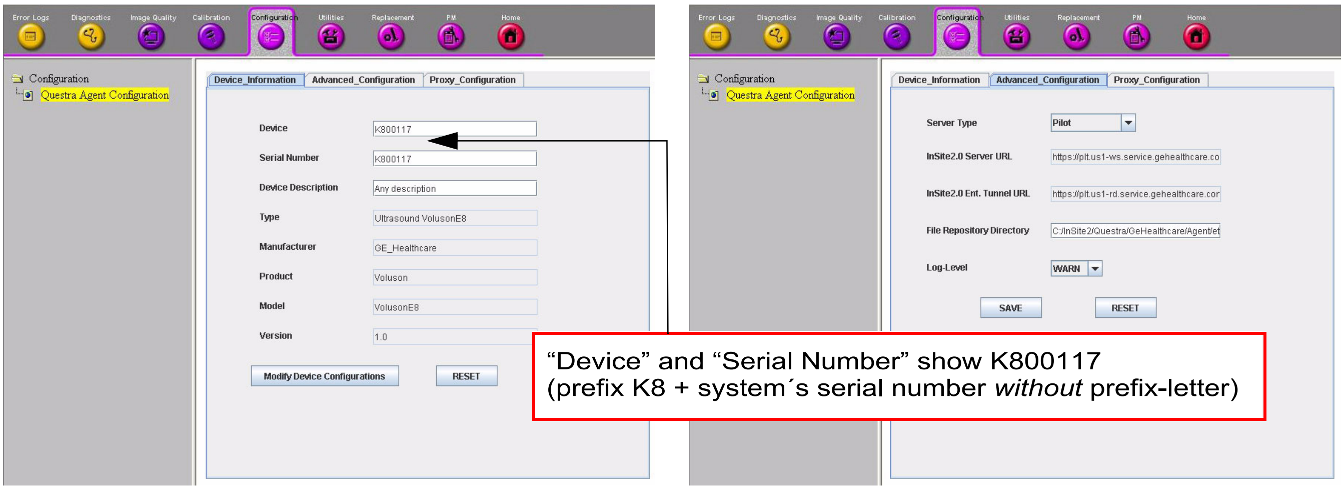


Figure 7-10 CSD - Configuration: Device Information / Advanced Configuration

Figure 7-10 above shows the [Device Information] and [Advanced Configuration] tab in the Questra Agent Configuration menu. This pages normally do not have to be modified.

7-5-4-1 To configure Service Platform

NOTICE If a Proxy server is available, the **information has to be properly entered, otherwise Questra 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 "Questra Agent Configuration".
3.) Select the [Proxy_Configuration] tab and enter Proxy Server Address and Proxy Server Port.

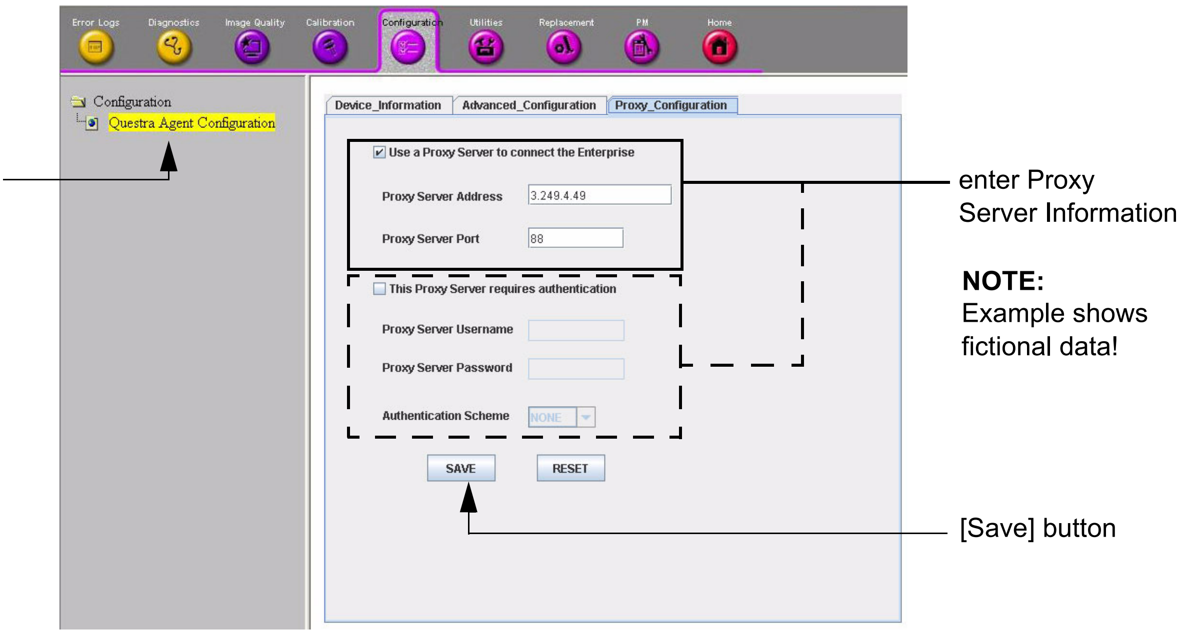


Figure 7-11 CSD - Configuration: Proxy Configuration

4.) Click the SAVE 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 touch 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.
The "password window" appears automatically.
4.) Enter the password SHE and click the ACCEPT button to display the Service Tools window.

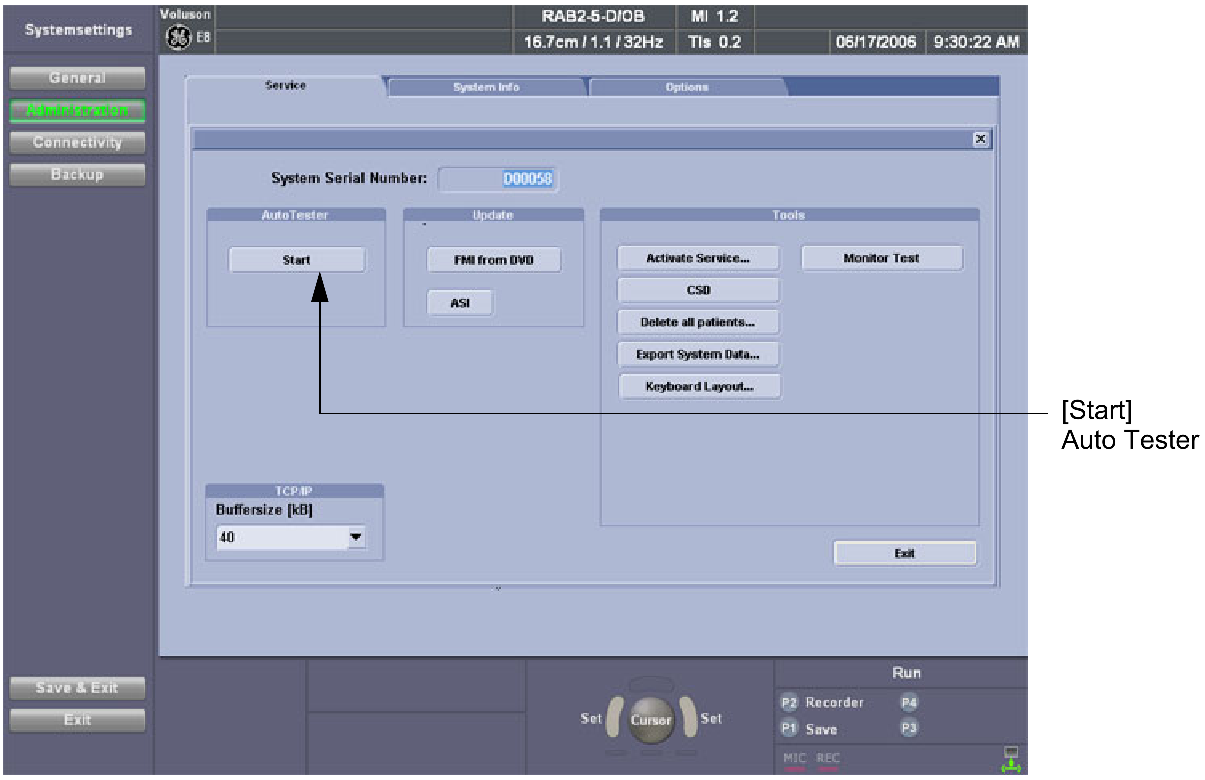


Figure 7-12 Service Tools window

5.) Activate the "Auto Tester" program by clicking START.

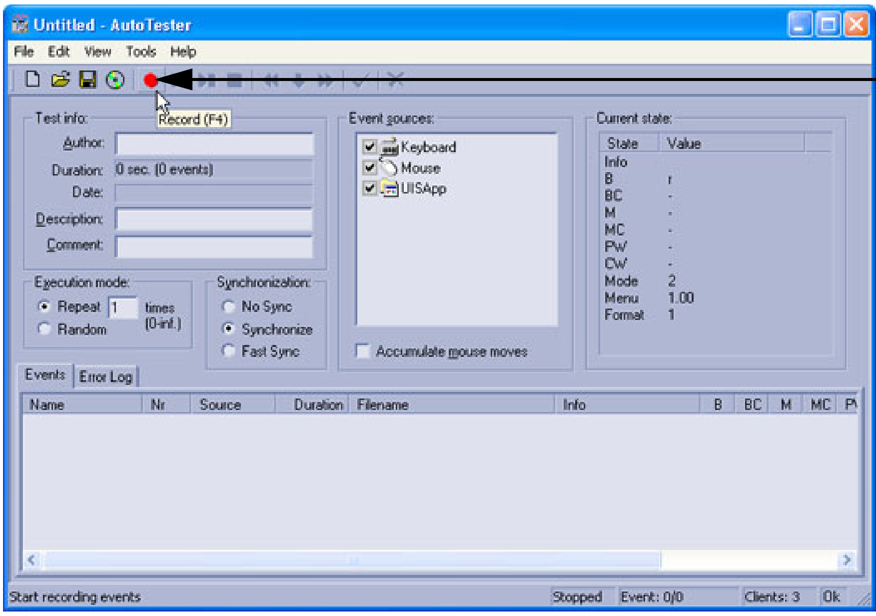
Section 7-6 How to use the Auto Tester program (cont'd)

The following message box appears.

Alt Gr
key on the
right lower corner
of the keyboard

Figure 7-13 Message Box

6.) Click OK.
7.) Press the **ALT GR** key on the alphanumeric keyboard.
8.) Activate the "Auto Tester" program by clicking the "Record" icon on the displayed screen.



"Record"
icon

Figure 7-14 Start Auto Tester

9.) 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.

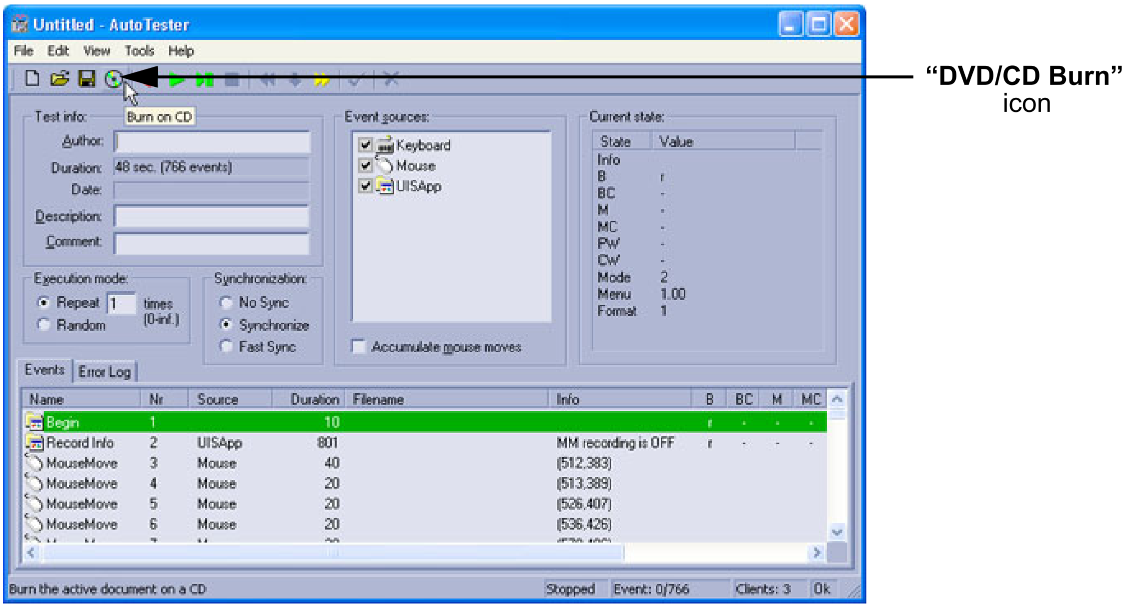


Figure 7-15 Auto Tester Finished

10.) Insert an empty DVD/CD+R/RW in the Drive and select the "Burn on CD" icon.

11.) Enter a Filename.

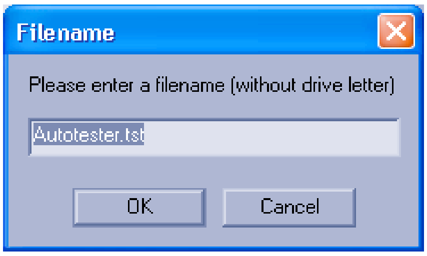


Figure 7-16 Enter a Filename

12.) After clicking OK, the following message boxes will appear.

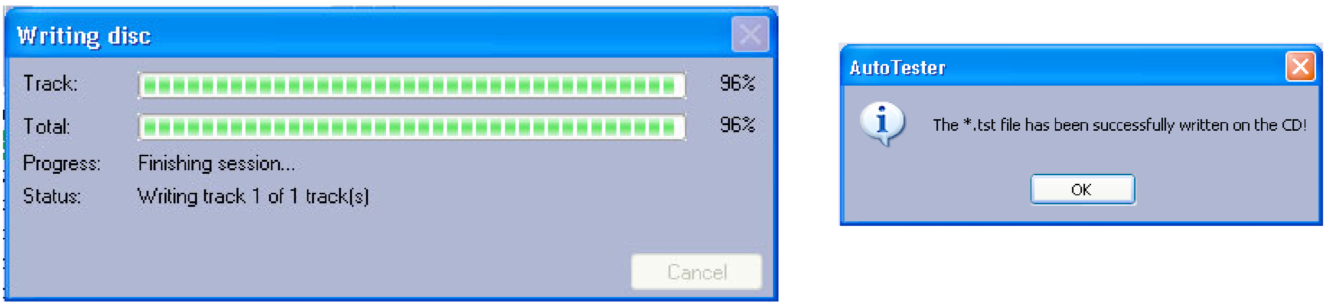


Figure 7-17 CD Burn Process

13.) After the DVD/CD write is finished click the OK button and then close the "Auto Tester" program.

Section 7-7
Minimum Configuration to Boot/Scan

7-7-1 Minimum Configuration to Scan

Following cables must be connected to scan:

a.) Console
b.) USB UI (User Interface) and USB Hub
c.) DVI Cable (Digital Visual Interface) from ADD-On DVI Out to RTV DVI In
d.) Monitor

BT Version: Please observe that cable-minimum configuration depend on currently installed PC-Motherboard and BT-version of the Voluson® E8 system.

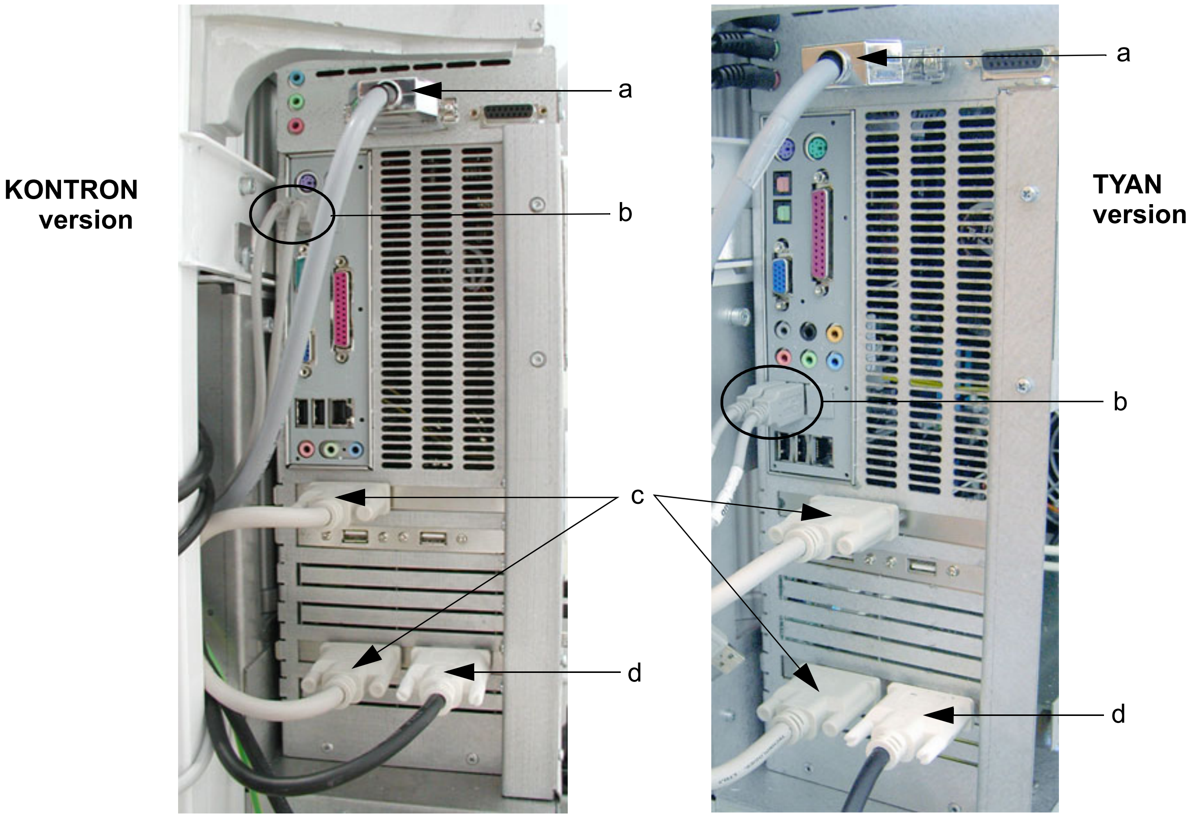


Figure 7-18 cable- minimum configuration (BT06)

7-7-1 Minimum Configuration to Scan (cont'd)

KONTRON Dual-core version

DFI Dual-core version

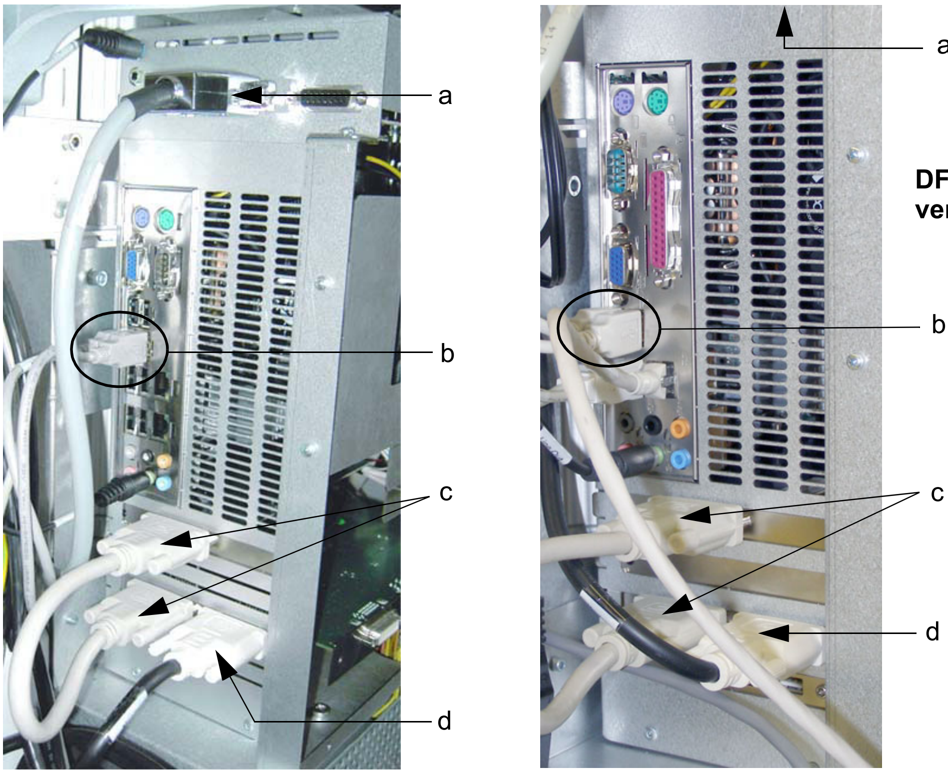


Figure 7-19 cable- minimum configuration (BT08)

1.) Connect the Mains Power cable and mount the pull-out protection (see: Figure 4-4 on page 4-4).
2.) Connect the Power Cable to an appropriate mains power outlet and switch ON the Circuit Breaker.
3.) Connect a probe.
4.) Press the **ON/OFF** Standby switch on the Control Panel to boot up the System.
5.) Start an User Program.

Section 7-8
Troubleshooting Trees, Instructions and Tech Tips

Table 7-2 below outlines Voluson® E8 troubleshooting trees and instructions shown in the sub-sections.

Table 7-2 Troubleshooting Trees and Instructions

7-8-1 System does not boot up

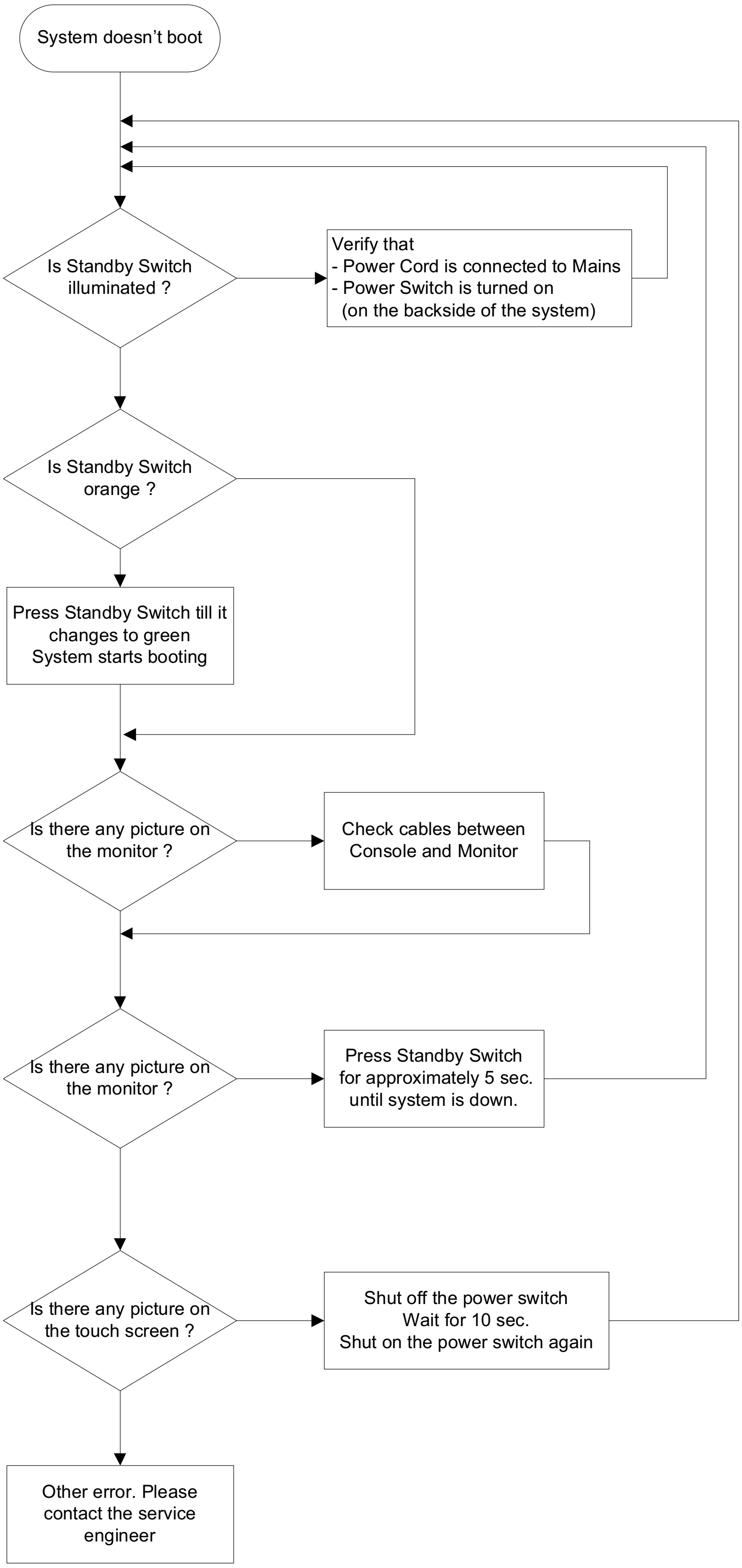


Figure 7-20 System does not Power On / Boot Up

7-8-2 Noise disturbs the Image

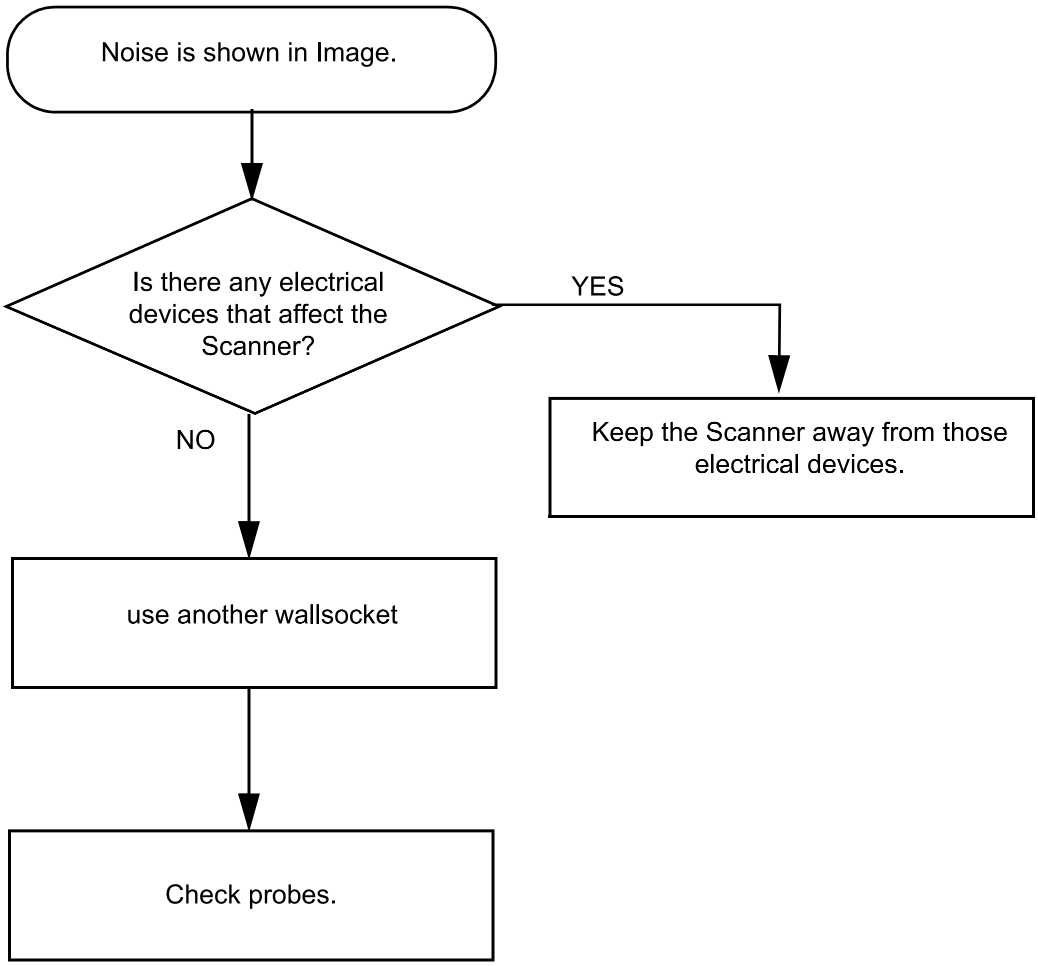


Figure 7-21 Noise disturbs the Image - Troubleshooting

7-8-3 Trackball - Impaired Sensitivity

The trackball has low sensitivity!

Is it difficult to roll the trackball?

NO → Contact GE service representative to replace the trackball module.

YES ↓

Set up the appropriate trackball response time
(via [Trackball Speed] button in the System Setup - User Settings page).

Still low sensitive...

Remove the fixing ring by turning it counterclockwise.

Fixing Ring

Remove the trackball and clean it from dust.
Mount the outer fixing ring by turning it clockwise.

Return to normal scanning

Figure 7-22 Trackball - Impaired Sensitivity

7-8-4 Printer Malfunction

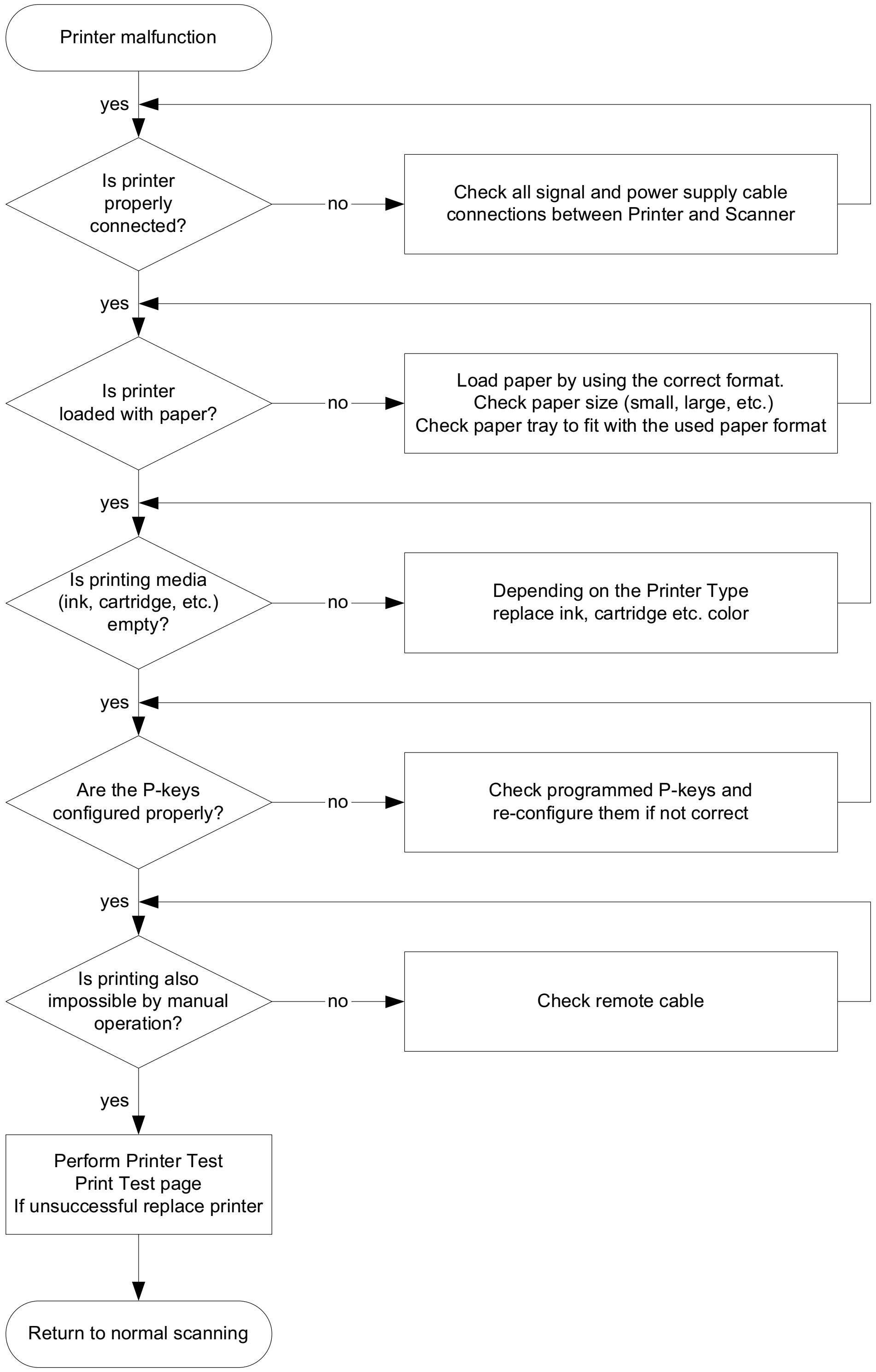


Figure 7-23 Printer Malfunction

7-8-5 Monitor Troubleshooting

Fault symptom	Check these items
No image	Check the power cord is properly connected.
	Check the video cable is properly connected.
	Check no pins of the video cable are bent.
	Check if video is present on backplane.
Color is not uniform	Turn ON the power to activate the Auto-Degauss function.
Colored streaks appear in image	Check for presence of magnetic sources near the monitor. Eliminate the sources and then degauss the monitor.
Screen image is not centered or sized properly	Adjust the picture location, picture size, picture rotation or pincushion distortion.
	Some video modes do not fill the screen to the edge of the monitor. There is no single answer to solve the problem. This phenomenon may occur on higher refresh rates (vertical frequency).
Picture is fuzzy	Adjust the picture contrast and picture brightness. Some SVGA cards having an excessive video output level will cause a fuzzy picture at the maximum contrast level.
	Turn ON the power to activate the Auto-Degauss function.
Video test patterns are not clear, bright, parallel or square	Replace the monitor.

NOTICE The monitor should automatically degauss itself each time power is applied if you wait at least 15 seconds before you turn power back ON.

For further details refer to Section 6-3 "LCD Monitor Adjustment" on page 6-2.

7-8-6 DVD/CD+R/RW Drive Test

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) and then click on DATA TRANSFER.

7-8-6 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.

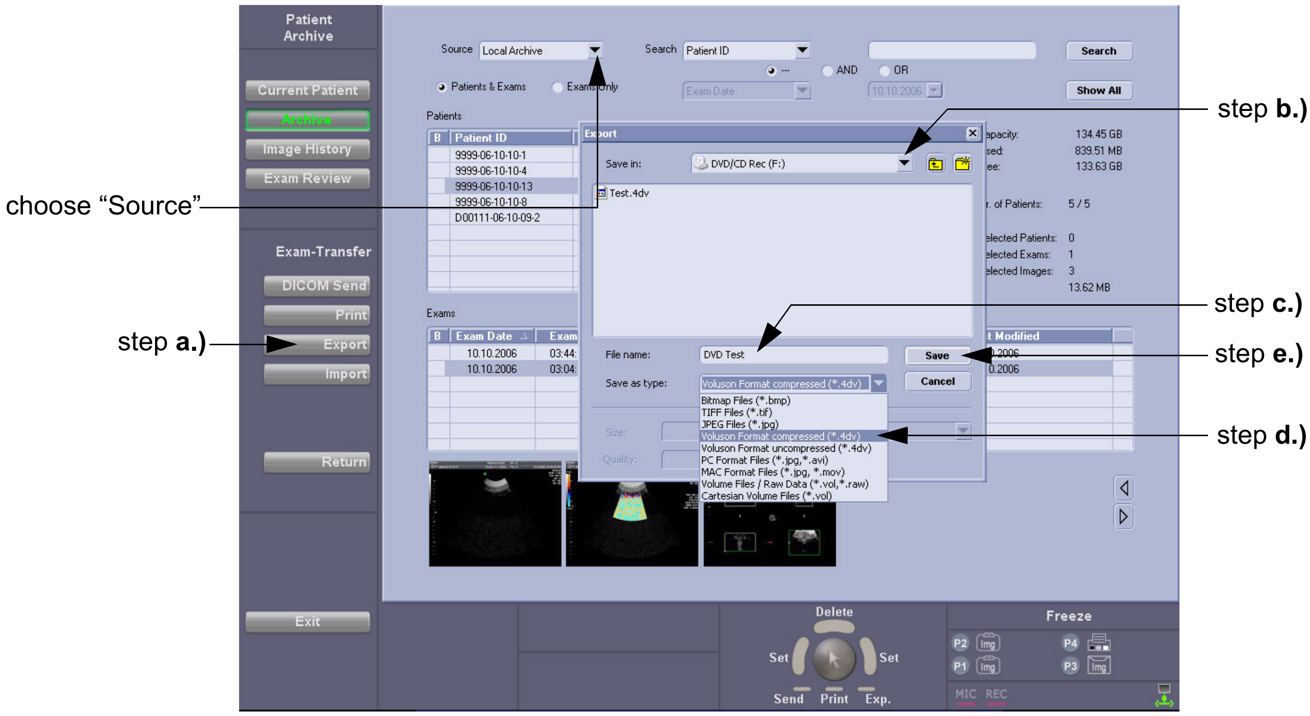


Figure 7-25 Export images to DVD/CD - as *.4dv format

7.) After successful export, choose Source "4DV" from the pop-up menu.

8.) The images, which you have chosen to export should be visible.

7-8-7 Network Troubleshooting

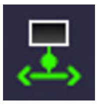
7-8-7-1 No Connection to the Network at All

1.) Check that the network cable between the scanner 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 your Scanner and your PC by either using a hub or a cross-over cable. Try to ping from the Scanner to the IP address on the PC. If OK, hardware connection inside the Scanner is OK.

7-8-7-2 GE remote service connection

The customer gets visual information about the network status (shown in the status area on the right side of the screen). The network status is defined as follows:

NO ICON - Cable disconnected or no network signal on a connected cable.



Green - Cable connected to a network. **Does not imply** proper network settings.

BLUE - All the following processes are active: UL_VNC, UL_Telnet or UL_CSD.
These processes are used when remote access is active, so they are used as an indicator.

NOTE: The status is checked every 10 seconds, regardless whether you‘re in read or write mode.

7-8-8 Tech Tips

Use Table 7-3 below to access Voluson® E8 (troubleshooting) Technical Tips listed.
Each entry in the table will hyper-link to the issue, cause and solution.

Table 7-3 Technical Tips

7-8-8-1 Storing SonoView images to Voluson® E8

Issue: Storing SonoView images from Voluson® 730/Expert/Pro/ProV to Voluson® E8

Cause: Archive is different (no SonoView on Voluson® E8)

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® E8

Procedure:

1.) Connect external hard disk or insert CD/DVD on the Voluson® E8.
2.) Open Archive --> select "Data Transfer" --> "Import". The "Open File" window appears

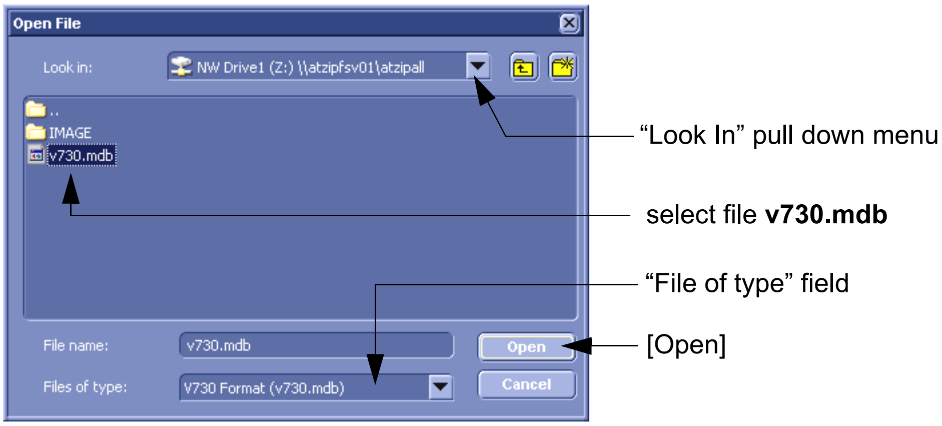


Figure 7-26 Open File

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.

7-8-8-2 Adverse affects on image quality (after upgrade or preset load)

Issue: Whenever a system is upgraded or new presets are loaded, it is probable to have adverse affects on image quality.

Cause: Tune-Version of the Application presets at the System Setup - ADMINISTRATION - **SYSTEM INFO** tab (see: Figure 7-27 on page 7-26) does not match the system software version.

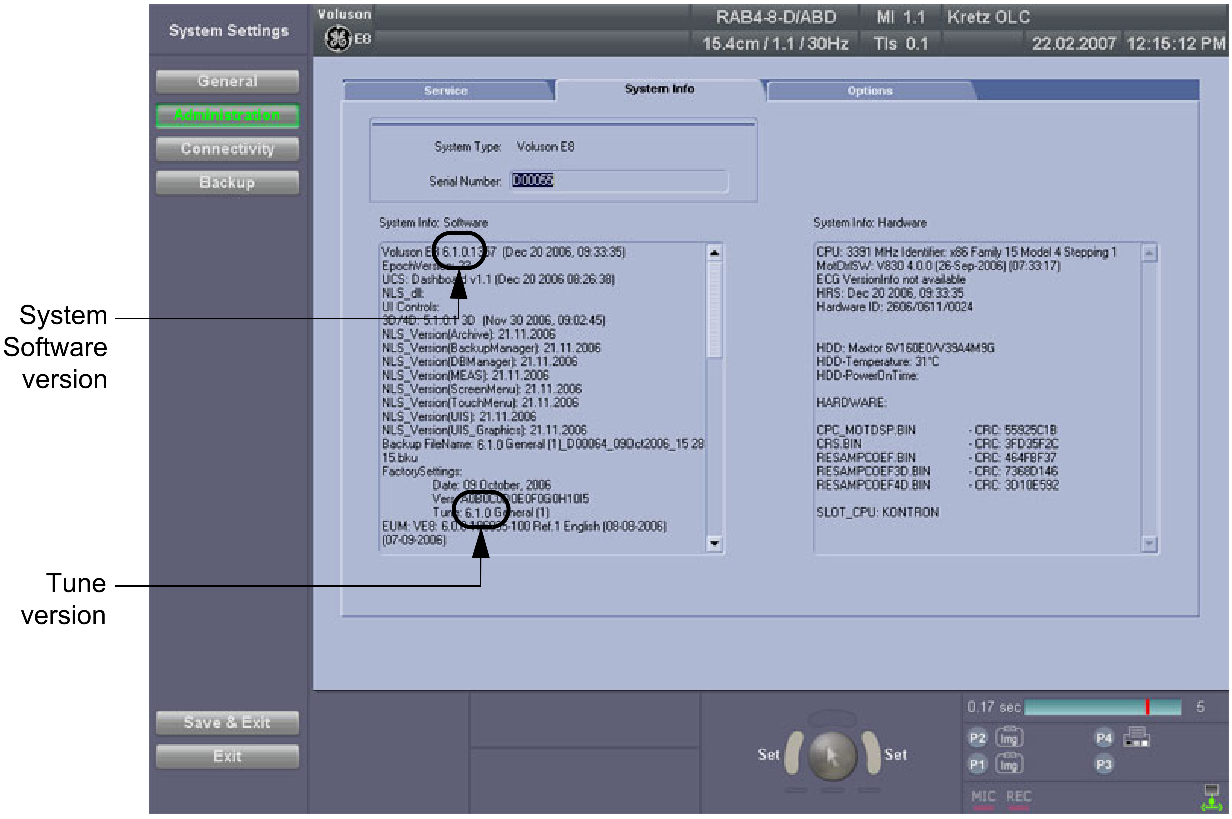


Figure 7-27 Software version matches the Tune Version

Solution: It is essential to reload the correct Application Settings.

Procedure:

1.) Press the **UTILITIES** key on the control panel.
2.) In the “Utilities” menu touch 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.) Go to Section 4-5-2 "Load Image Settings Only" on page 4-34.
You find the original application settings on the following places:

- On the hard drive: D:\usersettings\FactoryDefault\V830
- On the System DVD: F:\sys\win-images\Volusone8\settings

7-8-8-2 Adverse affects on image quality (after upgrade or preset load) (cont'd)

5.) On the reload screen please select the "Application Settings" **[1.]**, using the >> button move them to the right side of the screen **[2.]**, finally click LOAD **[3.]**.

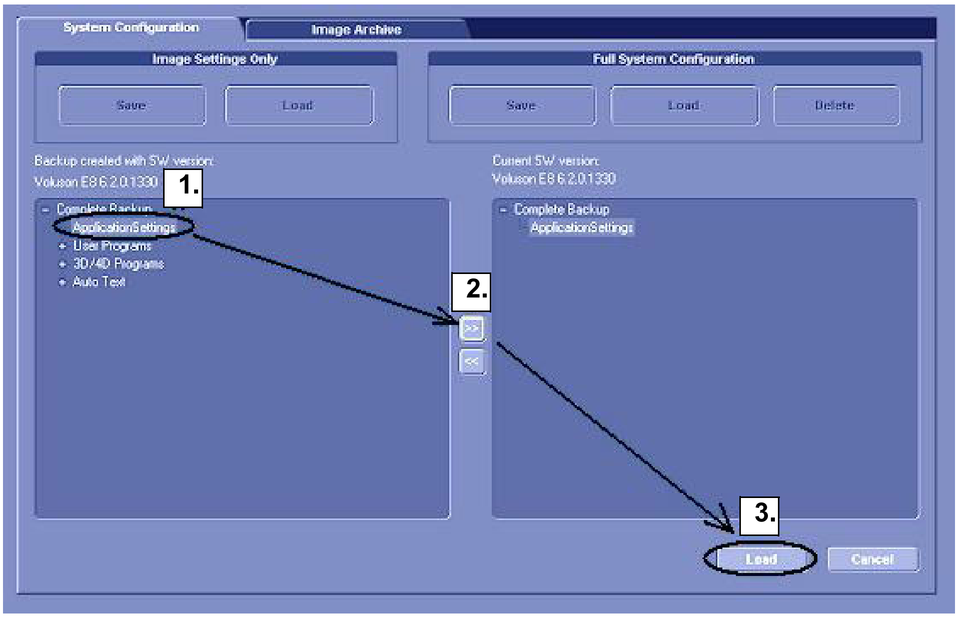


Figure 7-28 steps to load Application Settings

NOTICE When reloading these Application Settings, any previous modifications done by the user to his user settings (sub menu parameters, naming, etc.) will **NOT be affected!**

6.) After loading the proper Application Settings,

7-8-8-3 Daylight Saving Time (DST) - New Dates

Issue: The automatic Daylight Saving Time feature in Microsoft Windows products may no longer run on the correct date, causing the system's time to be incorrect.

Cause: Some countries have changed their start and end dates for Daylight Saving Time (DST). Access Microsoft website http://support.microsoft.com/kb/928388 to determine if the system's location site is affected.

Solution: If the Voluson® E8 relies on the automatic DST feature in Microsoft Windows, turn off the feature and then set the correct system time manually at the start of DST and again at the conclusion of DST.

NOTE: The Daylight Saving Time Patch is supplied as standard at Software version 6.2.0 (or higher).

Procedure:

1.) Press the **UTILITIES** key on the control panel.
2.) In the "Utilities" menu touch SYSTEM SETUP to activate the setup desktop screen.
3.) On the left side of the screen select GENERAL and then click on the **GENERAL** tab.
4.) Click the DATE/TIME button.
5.) In the displayed "Date/Time Properties" window select the **TIME ZONE** tab.
6.) Uncheck "Automatically adjust clock for daylight saving changes" check box and then click APPLY (see: left image of Figure 7-29 below).

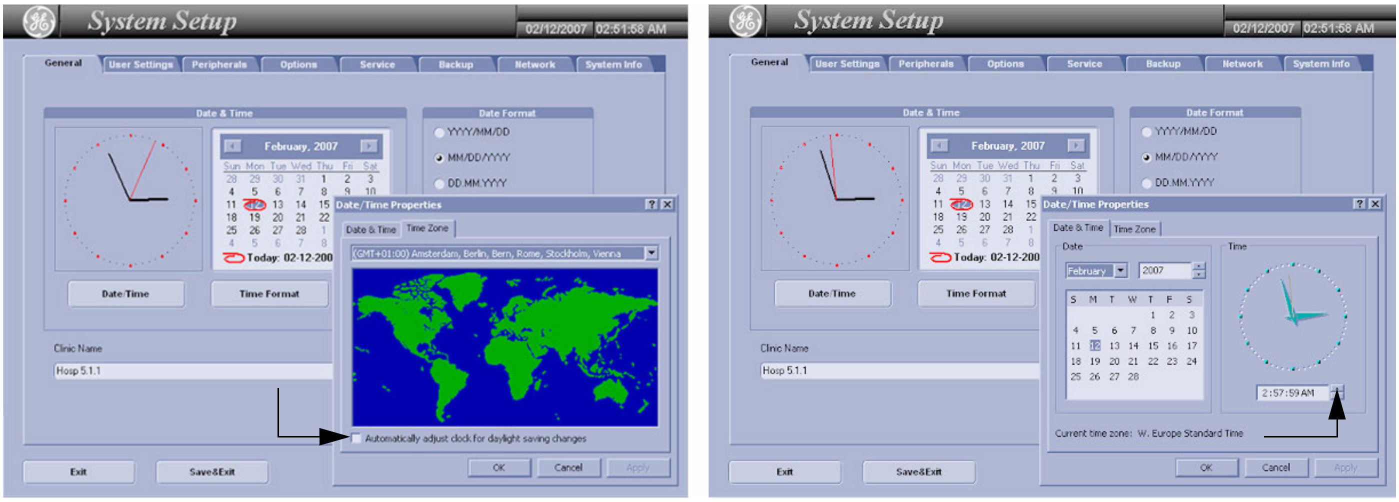


Figure 7-29 Uncheck check box / adjust time

7.) Select the **DATE / TIME** tab in the "Date/Time Properties" window.
8.) Set the proper time for the system's location and then click OK (right image of Figure 7-29 above).
9.) Click the SAVE&EXIT button to save your changes and exit the System Setup page.

The System is shutting down automatically and restarts again.

Section 7-9
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	Connect another Probe
530-Probe connected on left probe connector (A).	Connect another Probe
530-Probe connected on middle probe connector (B).	Connect another Probe
530-Probe connected on right probe connector (C).	Connect another Probe
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
Aperture Shape Form for 1.5D Array wasn't found !!! Action: restart the system	restart the system
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

Error Messages	Actions
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
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

Error Messages	Actions
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 upper-left probe connector (CW).	Connect another probe
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 830_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 830_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
Can't open: trans1.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

Error Messages	Actions
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
CW Archive::not implemented Action: restart the system	restart the system
CW quant TX Frequ out of range	restart the system
CW_BaseLinePos Out Of Range	press ok and save this user-setting once again
CW_Gain Out Of Range	press ok and save this user-setting once again
CW-hardware doesn't support	pencil probe + CW-Hardware not available-> restart the system
CW-TxFrequency == 0	restart the system
D:\\SERVICE\\ConfIndexFile is corrupted Action: restart the system	restart the system
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

Error Messages	Actions
DVD Recorder timeout error! Check Recorder cables, DVD,... and try again.	check DVD connections, check if DVD is switched on
ECG Module not connected!	connect ECG Module
ECG_Consumer : memory allocation failed	restart the system
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 during Nathan probesetup data calculation!	restart the system
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 in Select Tx-channel for C-mode	restart the system
Error in Select Tx-channel for CW-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

Error Messages	Actions
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
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 doesn't support CW-mode	pencil probe + CW-Hardware not available-> 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

Error Messages	Actions
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(eVideoExtern) function fails	restart the system
iSetVideoSource(eVideoIntern) function fails. Action: reboot the system	reboot 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
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

Error Messages	Actions
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 CW_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
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

Error Messages	Actions
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 with Probe-ID xx not supported on upper-left probe connector (CW).	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).	
Probe-ID valid, but Flexible-EEPROM-Datamodel not implemeted yet on upper-left probe connector (CW).	
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
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)

Error Messages	Actions
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
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

Error Messages	Actions
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
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

Error Messages	Actions
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
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
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

Error Messages	Actions
System detected severe error. Some components like Touch Panel server may not be registered. Please register Touch Panel server and restart. Action: If after restart not ok then call technical support	restart the system, call technical support
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 4-37) to “DVD/CD”, “Network”, or “Other drive” (including images) • if not currently done, save “Image Archive” (see: Section 4-5-6-1 on page 4-42), • 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
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

Error Messages	Actions
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
undefined CW ADC_Clk-Teiler	restart the system
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
VCR communication error! Check VCR cables and try again.	check VCR connections, check if it is switched on
VCR not properly connected or turned off! Check connection from US machine to VCR, VCR has power and is on.	check VCR connections, check if it is switched on
VCR timeout error! Check VCR cables, cassette,... and try again.	check VCR connections, check if it is switched on
Verify error (Error while checking backup data.)	Backup data are probably damaged. Try again or load another backup.
ViewerConMngr::vAssembleCF_DFE: attempt to get ECG_Consumer_2D- or ECG_Draw_2D-Block from ECGViewer Objects failed!!	restart the system
ViewerConMngr::vAssembleM_DFE: attempt to get ECG_Consumer_2D- or ECG_Draw_2D-Block or ECG-CalcHR-Block from ECGViewer Objects failed!!	restart the system

Error Messages	Actions
ViewerConMngr::vAssembleM_DFE: attempt to get ECG_Consumer_2D- or ECG_Draw_2D-Block or ECG-CalcHR-Block from ECGViewer Objects failed!! Action: Restart the system, If after restart not ok then call technical support	restart the system
ViewerConMngr::vAssembleTissueDFE : attempt to get ECG_Consumer_2D- or ECG_Draw_2D-Block from ECGViewer Objects failed!!	restart the system
Volume_dB Out Of Range	press ok and save this user-setting once again
WMF_KoefBlock: SamplePRF too big	restart the system
Write error! Action: use a new CDR, call technical support	use a new CDR
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.***

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

Table 8-1 Chapter 8 Contents

8-1-2 Returning/Shipping System, Probes and Repair Parts

When returning or shipping the Voluson® E8 system in the original packaging:

- system must be lowered to its minimum height with monitor flapped down (see: Figure on page 3-6)
- the Control Console has to be centered and locked in “unextended” position

NOTE: For Control Console Positioning refer to Section 6-5 on page 6-8.

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 8-6.
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.

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)
- SW version below 6.2.x only: check current network drive connection (Figure 8-4)

*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)

1.) Press the **UTILITIES** key on the control panel.
2.) In the "Utilities" menu touch 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.

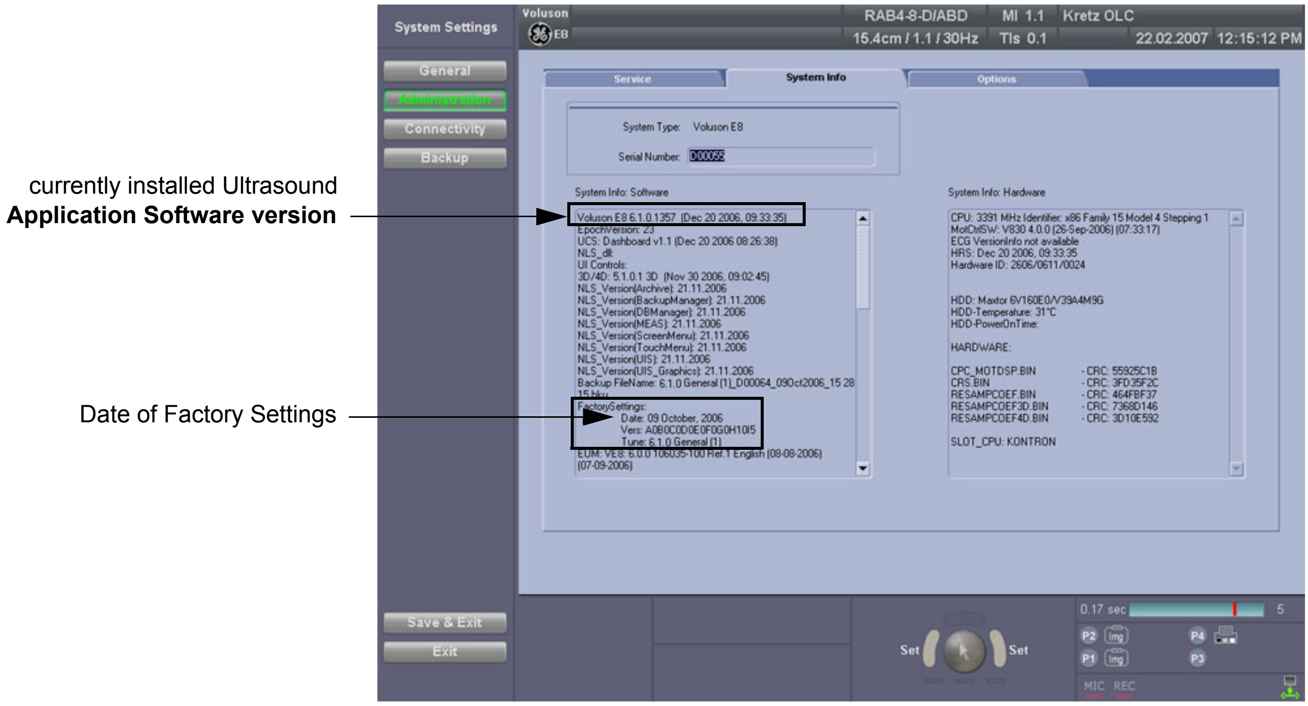


Figure 8-1 Version check (System Setup - Administration - SYSTEM INFO page)

8-2-4 Preparations (cont'd)

4.) Select the OPTIONS tab to see which Options (and Application Packages) are installed.

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])

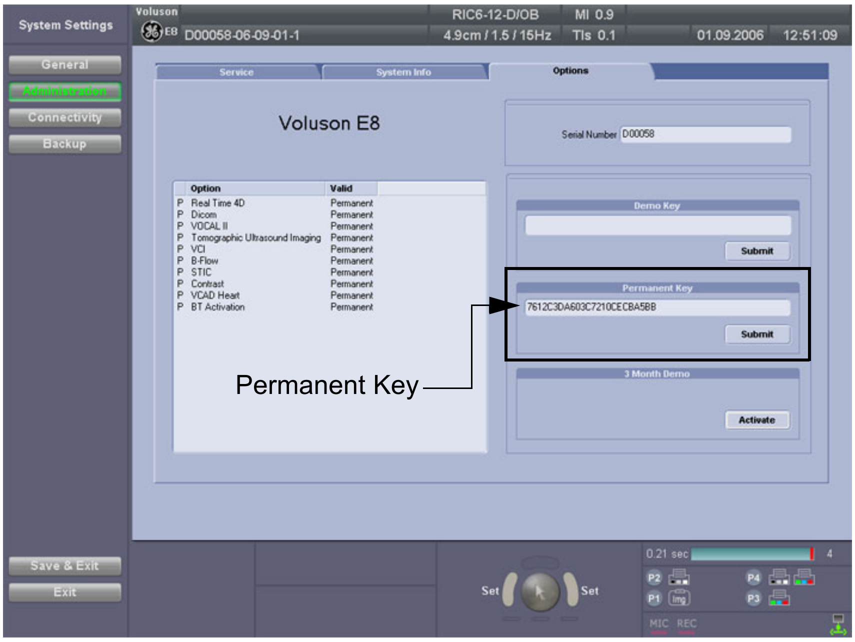


Figure 8-2 System Setup - Administration - OPTIONS page (BT06 systems)

Application Packages

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])

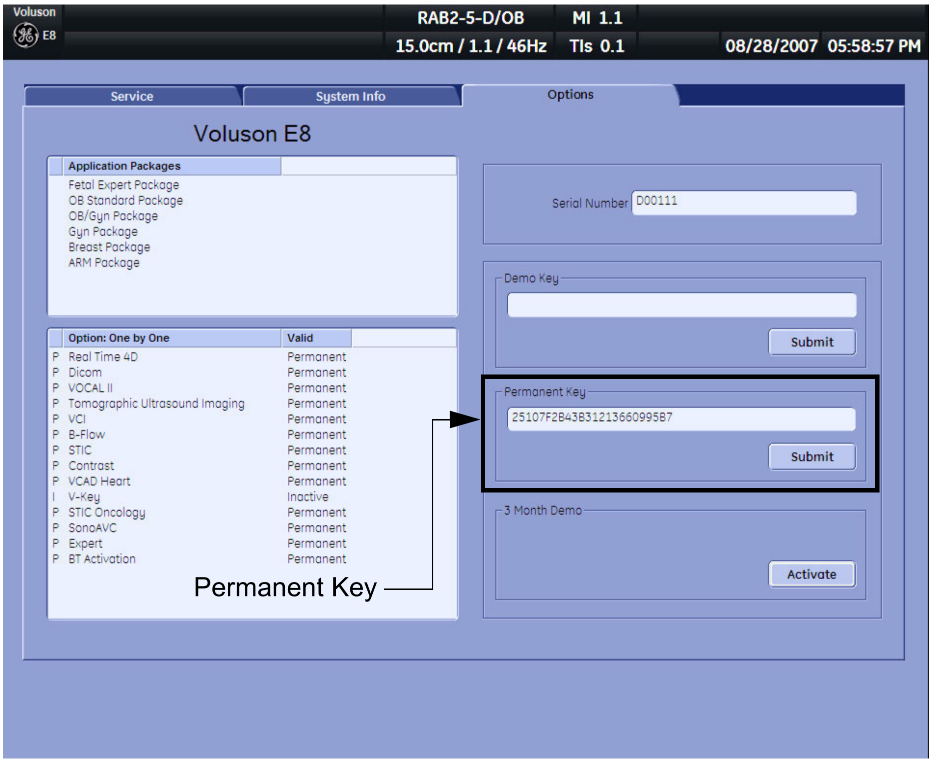


Figure 8-3 System Setup - Administration - OPTIONS page (BT08 systems)

NOTICE Please print out the OPTIONS page or write down the "Permanent Key"!

If currently installed Application Software version is below 6.2.x:

1.) Press the **USB** Key (= “F5” key) on the alphanumeric keyboard.
2.) In the displayed “Connect USB and Network Drives” window, select the MAP NETWORK DRIVE button (Figure 8-4 below, left image) to open the dialog (Figure 8-4 below, right image).

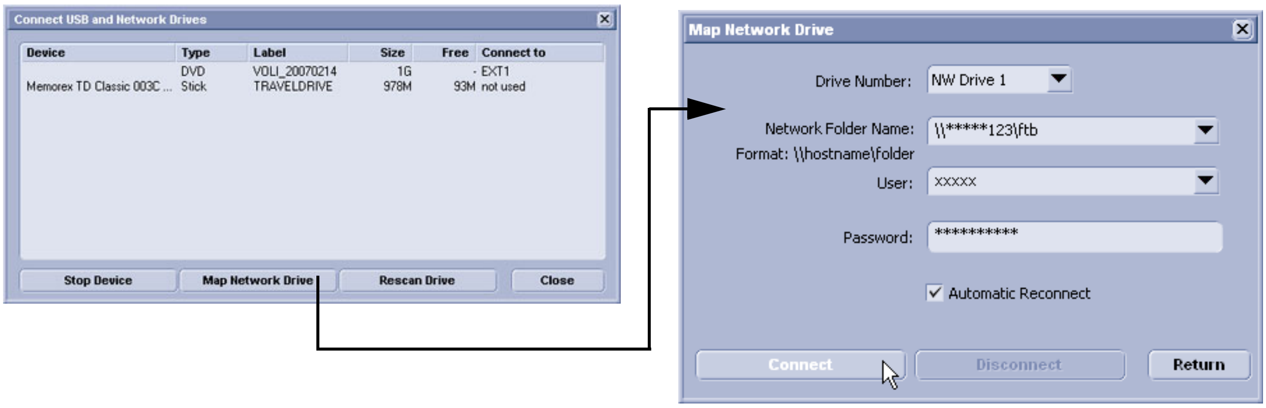


Figure 8-4 Map Network Drive setting

NOTICE Please print out the “Map Network Drive” dialog page, or write down all its information. For detailed description refer to Section 3-12-1 "Map Network Drive" on page 3-88.

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 Section 5-15-3-2-1 on page 5-66.

1.) Perform Preparations as described in Section 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 touch SYSTEM SETUP to invoke the setup desktop on the screen.

8-2-5 System Software - Installation Procedure (FMI from DVD) (cont'd)

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.

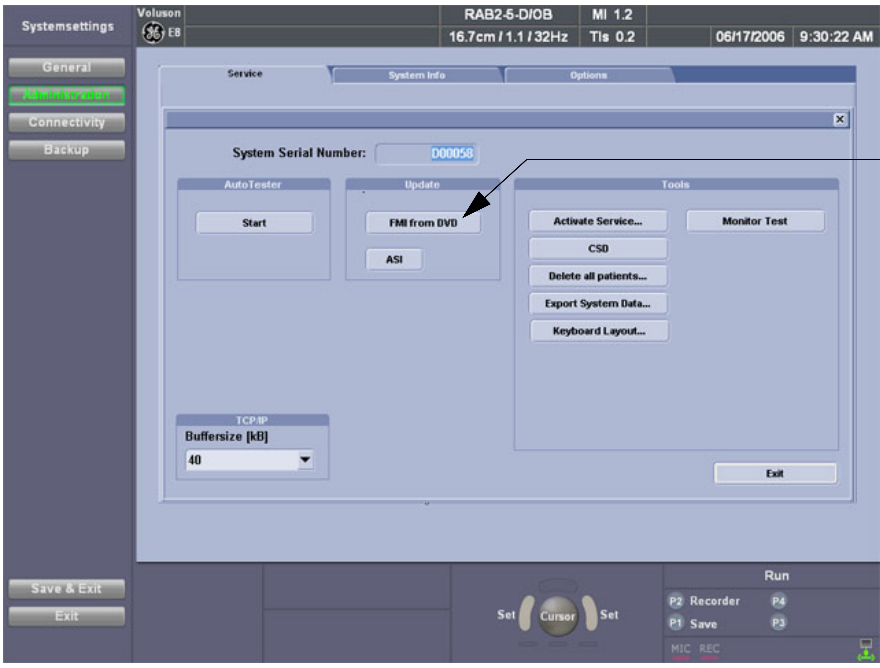


Figure 8-5 Service Tools

NOTICE Please verify that you have recorded the **Permanent key** (see: Figure 8-2 on page 8-5).

9.) Click the FMI FROM DVD button (see: Figure 8-5 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 8-6 below).

Figure 8-6 Verify that USB devices are disconnected, then click OK

11.)To start update procedure click YES (Figure 8-7 below).

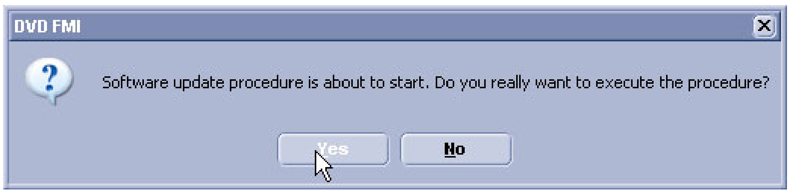


Figure 8-7 Yes - start update procedure

12.)The system saves Full Backup in silent mode on R:, then it reboots into LINUX.

13.)A silent "Rollback" image from C:\ is stored on R:\.
After executing all LINUX commands, the system reboots again.

8-2-5 System Software - Installation Procedure (FMI from DVD) (cont'd)

14.)Check disk is performed automatically - restart.

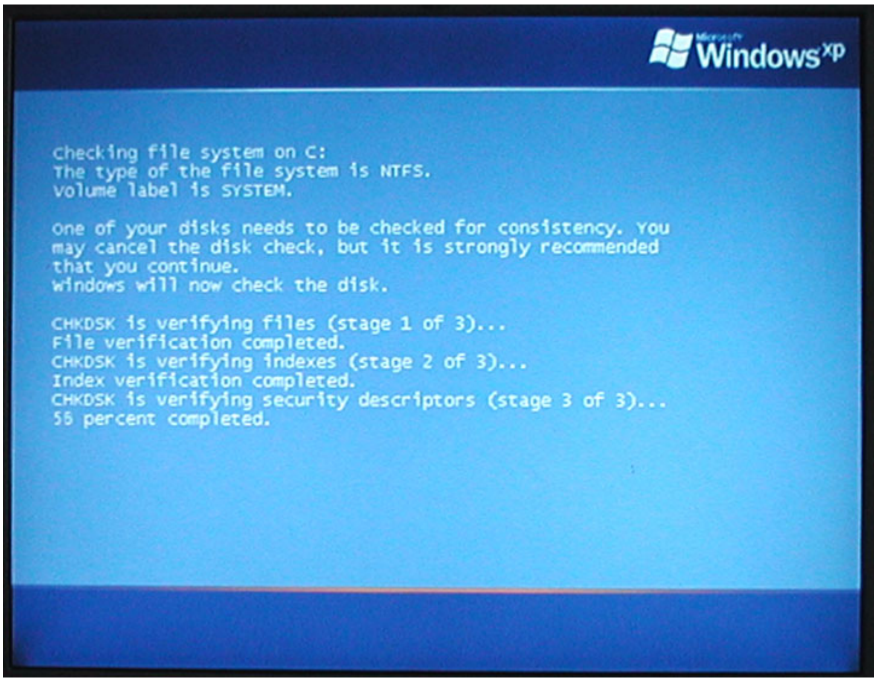


Figure 8-8 Check disk is performed automatically

15.)3 dots (one after the other) appear on the screen (see: Figure 8-9 below).

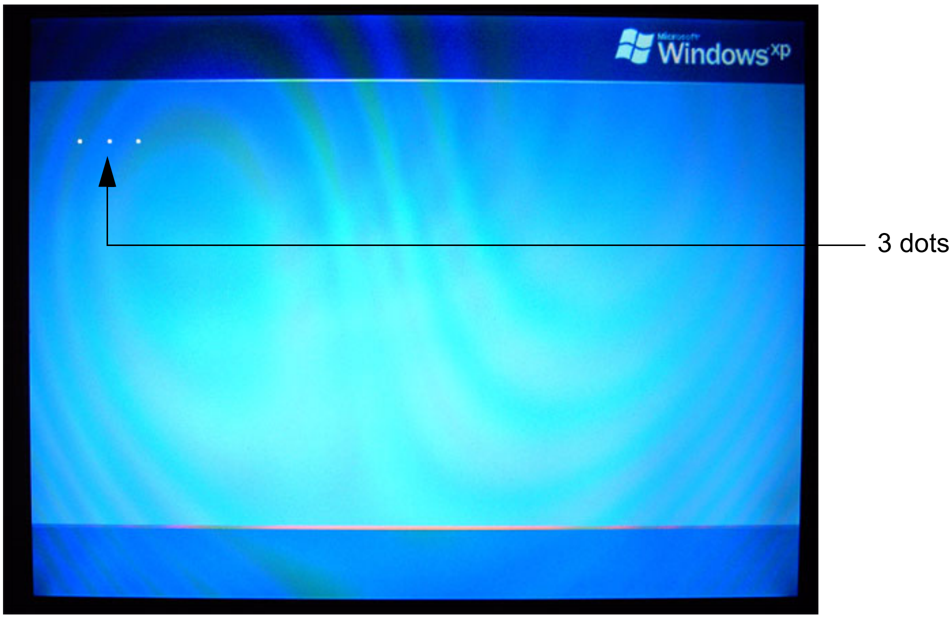


Figure 8-9 3 dots appear on the screen

8-2-5 System Software - Installation Procedure (FMI from DVD) (cont'd)

16.)Booting **auto**.....

Figure 8-10 Boot screen - auto

17.)Updating will take some time......

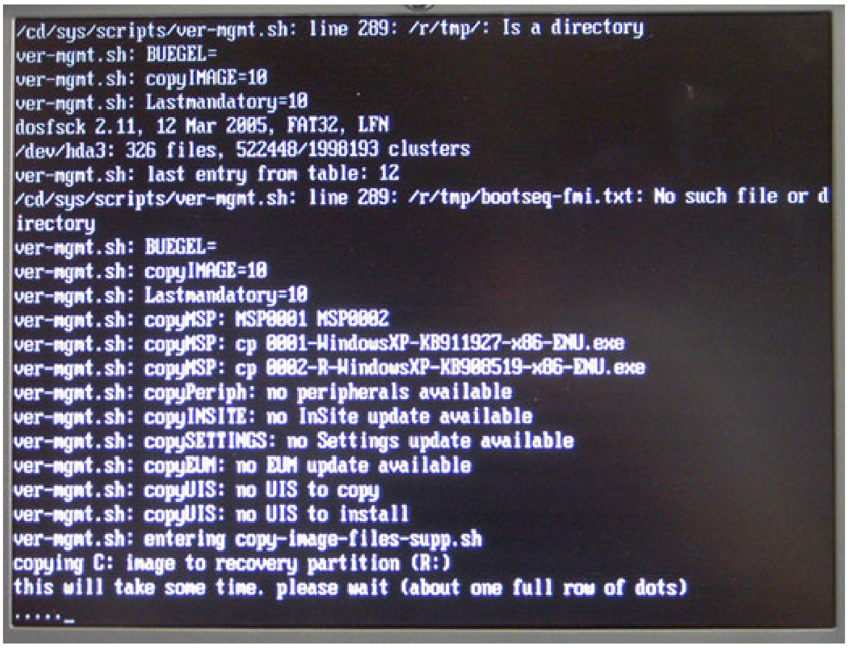


Figure 8-11 Please wait....

18.)Please wait until all processes are finished (100 percent completed).

19.)The system is rebooting into windows (Boot screen - **Voluson**).

8-2-5 System Software - Installation Procedure (FMI from DVD) (cont'd)

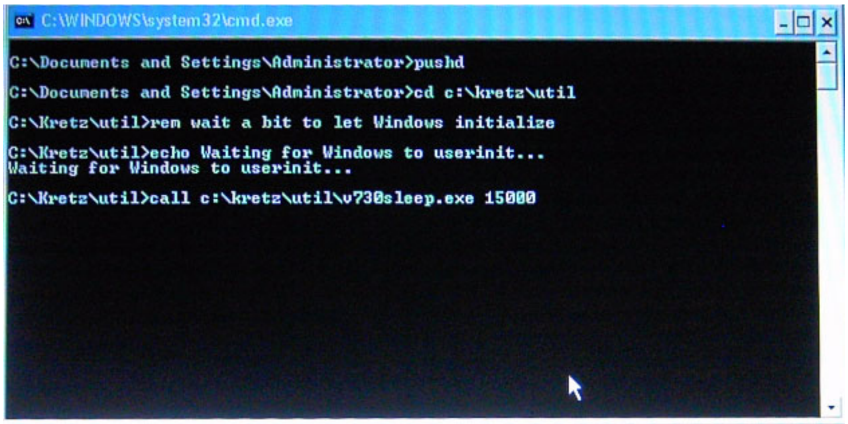


Figure 8-12 automatic processes are running

20.) 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 Permanent key previously recorded (see: Figure 8-2: System Setup - Administration - OPTIONS page (BT06 systems) on page 8-5) and then click SUBMIT.

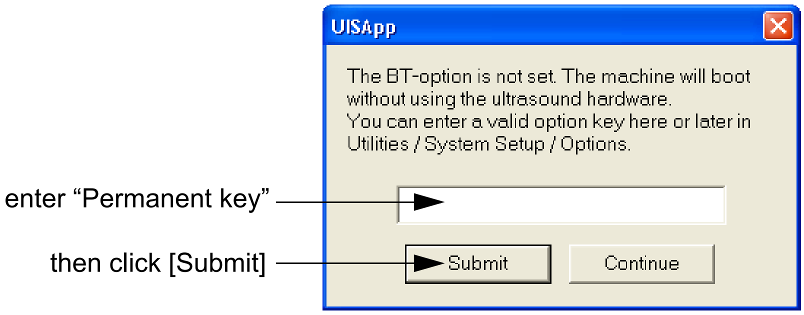


Figure 8-13 Enter Permanent key

21.) Remove the System DVD from the DVD/CD+R/RW Drive drive.

22.) If Touch 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.

23.) **Reconnect the external devices**, install all the printers and adjust the printer settings as described in Section 3-7 "Printer Installation" on page 3-52.

24.) Check and match Printer Remote Control selection in the System Setup - Connectivity - BUTTON CONFIGURATION page.

25.) Confirm that the date and time are set correctly and that the Windows automatic DST feature is off. Refer to Section 7-8-8-3 "Daylight Saving Time (DST) - New Dates" on page 7-28.

26.) In case that Application software was below SW 6.2.x (prior to system upgrade), check and match Network drive settings (see: Figure 8-4 on page 8-6) according to the printout.

27.) Perform Software and Functional checks as described in Section 8-3 on page 8-11.

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 touch 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.

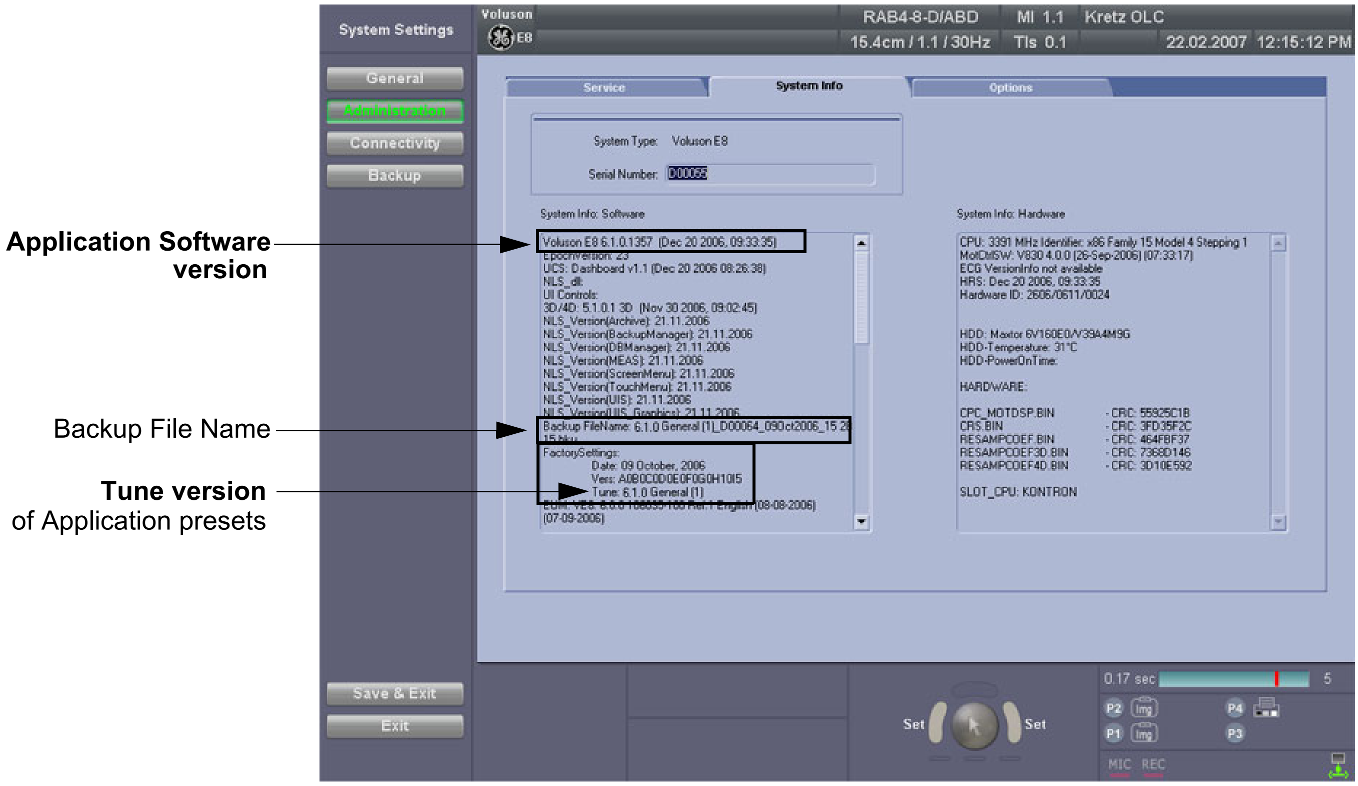


Figure 8-14 System Setup - Administration - SYSTEM INFO page

4.) Check the Application Software version.
5.) 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, it is probably that you have reloaded an old “Full Backup”. A warning message appears whenever booting up the system.
In this case, it is essential to **load** (at least!) the **proper Application Settings** (image presets), adapted for the installed software version. Refer to: Section 4-5-2 "Load Image Settings Only" on page 4-34.

6.) Verify the correct settings of the OPTIONS page; see: Figure 8-2 on page 8-5.
If necessary, customize the settings according to the printout.
7.) Restart the system and perform basic functional checks to ensure system is functioning normally.

Section 8-4
Image Settings Only (Application Settings) Loading Procedure

8-4-1 Introduction

The User Settings contains:

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

8-4-2 Loading Procedure

see: Section 4-5-2 "Load Image Settings Only" on page 4-34

Section 8-5
Full Backup (Presets, Configurations & Appl. Settings) Loading Procedure

8-5-1 Introduction

The Full Backup contains following data:

- User Settings (databases and files containing gray curves and the user settings)
- Measure Configuration (user specific measure setup settings)
- Patient Archive (database containing patient demographic data and measurements) - **no images**
- V830 Settings (general settings such as language, time/date format and the enabled options)
- 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 4-39

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 4-44

Section 8-7
Replacement or Activation of Options

Following SW Options are available:

at BT06 systems	at BT08 systems
Real Time 4D	Real Time 4D
DICOM	DICOM
VOCAL II	VOCAL II
Tomographic Ultrasound Imaging (T.U.I.)	Tomographic Ultrasound Imaging (T.U.I.)
VCI (Volume Contrast Imaging)	VCI (Volume Contrast Imaging)
B-Flow	B-Flow
STIC (Spatio-Temporal Image Correlation)	STIC (Spatio-Temporal Image Correlation)
Contrast (Coded Contrast Imaging)	Contrast (Coded Contrast Imaging)
VCAD Heart (Computer Assisted Heart Diagnosis Package)	VCAD Heart (Computer Assisted Heart Diagnosis Package)
	STIC Oncology
	SonoAVC (Sono Automated Volume Count)
	Expert (= Upgrade Voluson® E8 -> Voluson® E8 Expert)

NOTE: *Additional options are not yet implemented in the Voluson® E8.*

8-7-1 Operation for activating Options

1.) Press the **UTILITIES** key on the control panel.
2.) In the “Utilities” menu touch 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.

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])

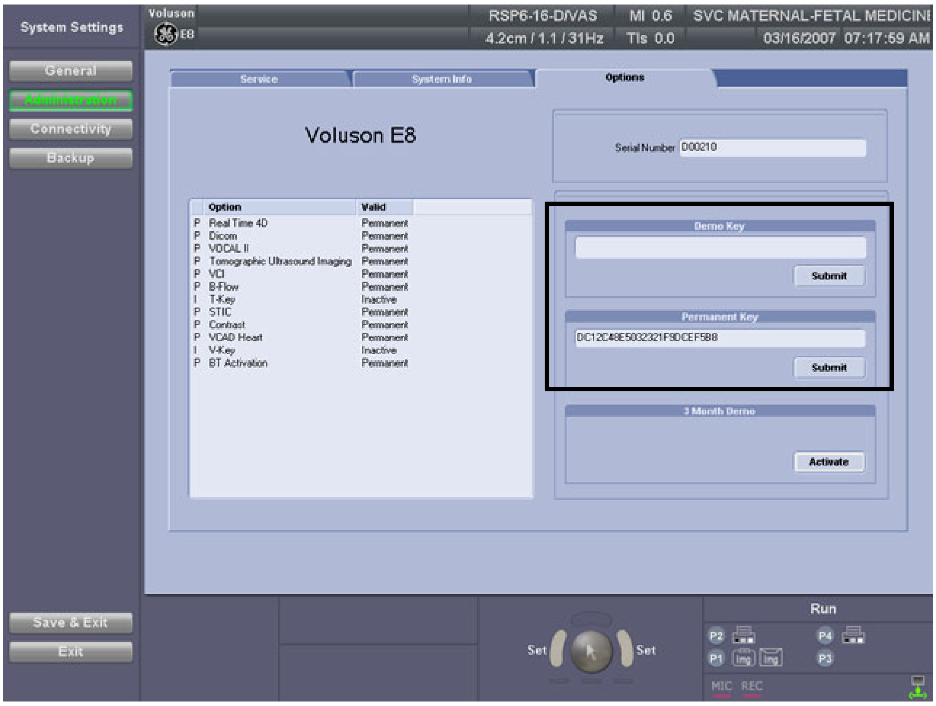


Figure 8-15 System Setup - Administration - OPTIONS page (BT06 systems)

8-7-1 Operation for activating Options (cont'd)

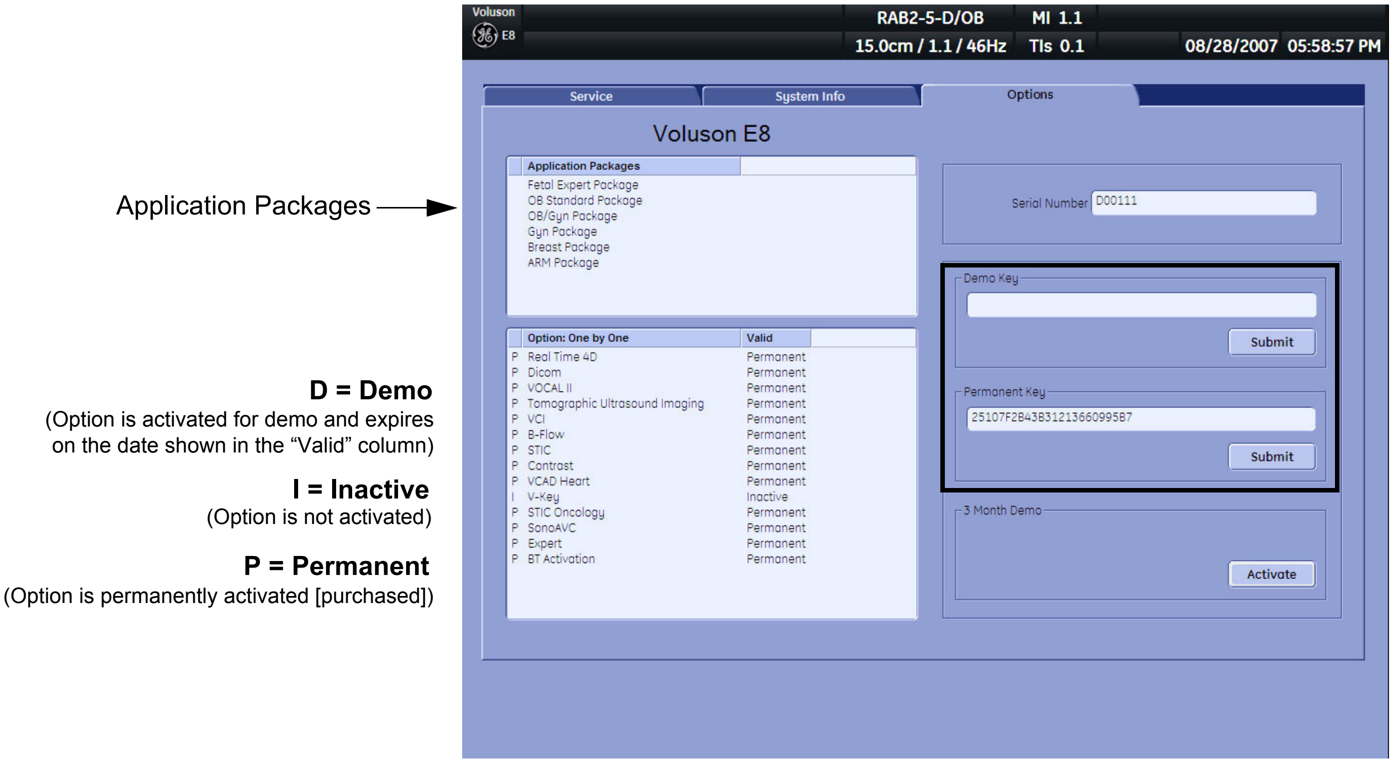


Figure 8-16 System Setup - Administration - OPTIONS page (BT08 systems)

NOTE: For more detailed description of Software Options and Application Packages (BT08 only) refer to: Description of Software Options on page 5-15.

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® E8 system.

Section 8-8
Replacement of Covers

Table 8-2 below outlines the Voluson® E8 cover replacement procedures described in the sub-sections.

Table 8-2 Replacement Procedures of Covers

Sub-section	Description	Page Number
8-8-1	Replacement of Footrest Cover	8-15
8-8-2	Replacement of Voluson Cover	8-16

8-8-1 Replacement of Footrest Cover

8-8-1-1 Manpower

One person, 1 minute

8-8-1-2 Tools

none

8-8-1-3 Preparations

1.) Power Off/Shutdown the system as described in Section 4-3-2 on page 4-4.

8-8-1-4 Footrest Cover - Removal Procedure

1.) For unlocking, turn the 2 quick release devices below the footrest 90°.

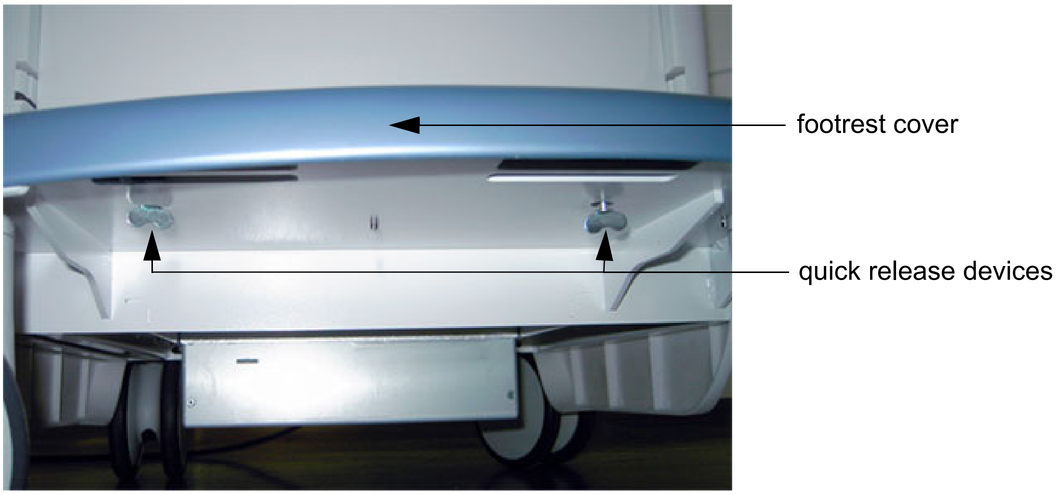


Figure 8-17 turn quick release devices 90° and remove footrest cover

2.) Remove the footrest cover.

8-8-1-5 Footrest Cover - Installation Procedure

1.) Place the (new) foot rest cover on the original position.
2.) For locking, turn the 2 quick release devices below the foot rest 90°.

8-8-2 Replacement of Voluson Cover

8-8-2-1 Manpower

One person, 1 minute

8-8-2-2 Tools

none

NOTE: The Voluson Cover is fixed by magnets only.

8-8-2-3 Preparations

1.) Power Off/Shutdown the system as described in Section 4-3-2 on page 4-4.

8-8-2-4 Voluson Cover - Removal Procedure

1.) Gently flap the Voluson cover upwards and then pull it away.

Figure 8-18 remove Voluson cover

8-8-2-5 Voluson Cover - Installation Procedure

1.) Place the Voluson cover on its original position.

Section 8-9
Replacement of the Cable Holder

8-9-1 Manpower

One person, 3 minutes

8-9-2 Tools

Philips screwdriver 1 and 2

8-9-3 Cable Holder - Removal Procedure

1.) Loosen the 2 screws below the control console and then remove the cable holder.

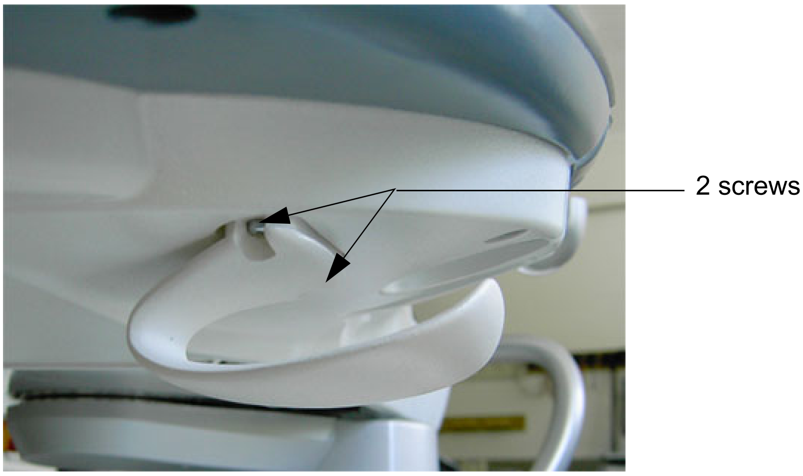


Figure 8-19 loosen 2 screws and remove cable holder

8-9-4 Cable Holder - Installation Procedure

1.) Place the new cable holder at its original position and fasten it with the 2 screws.

Section 8-10
Replacement of the Probe Holder (Kit)

8-10-1 Manpower

One person, 1 minute

8-10-2 Tools

None

8-10-3 Probe Holder (Kit)- Removal Procedure

1.) Pull out the elastic probe holder to be replaced.

Figure 8-20 pull out the probe holder

8-10-4 Probe Holder (Kit) - Installation Procedure

1.) Insert the new probe holder from the kit.

Section 8-11
Replacement of the Probe Holder for Endocavity probes

8-11-1 Manpower

One person, 15 minutes

8-11-2 Tools

Philips screwdriver 1 and 2

8-11-3 Probe Holder (endocavity) - Removal Procedure

1.) Loosen the 4 screws and then remove the probe holder for endocavity probes.

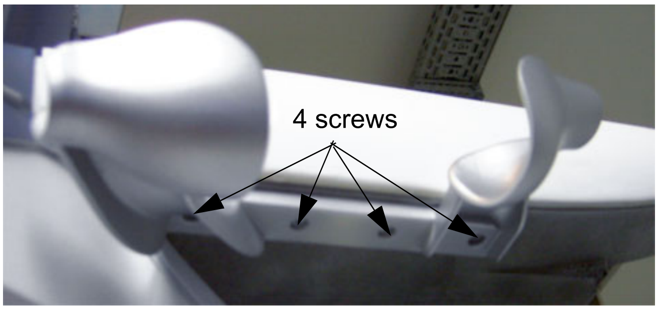


Figure 8-21 loosen 4 screws and remove probe holder

8-11-4 Probe Holder (endocavity) - Installation Procedure

1.) Place the new probe holder at its original position and fasten it with the 4 screws.

Section 8-12
Replacement of the Trackball Ring

8-12-1 Manpower

One person, 5 min.

8-12-2 Trackball Ring - Replacement Procedure

1.) Remove the fixation ring by turning it counterclockwise.

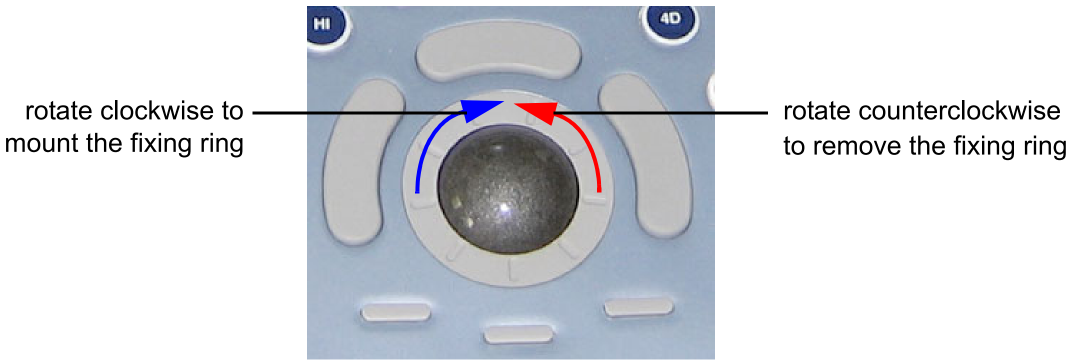


Figure 8-22 Trackball with Trackball “fixation” ring

2.) Mount the fixation ring by turning it clockwise.

Section 8-13
Replacement of Key Caps (by special native language keys)

NOTICE Table 9-13 on page 9-19 shows the available Key Cap Kits.
Keys to be removed depend on the (special native) language kit.

8-13-1 Manpower

One person, 30 minutes

8-13-2 Tools

small-sized slotted screwdriver or tweezers

8-13-3 Preparations

1.) Power Off/Shutdown the system; see: Section 4-3-2 on page 4-4.

8-13-4 Key Caps - Removal Procedure

1.) Carefully place a small flat screwdriver between the key cap you wish to remove and its neighboring key cap.
2.) Gently lift the key cap, until it is completely loosened from its base (see Figure 8-23 below).
3.) Remove the key cap.

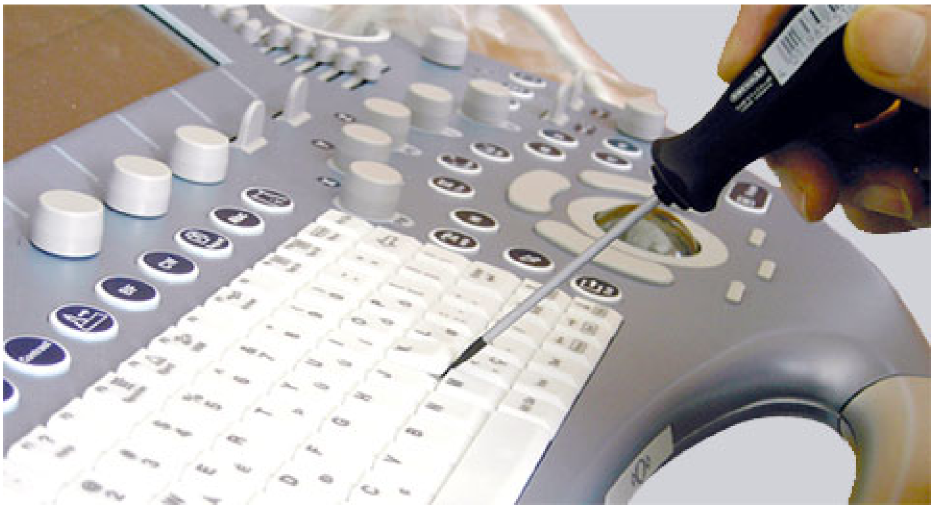


Figure 8-23 Key Cap Replacement

8-13-5 Key Caps - Installation Procedure

1.) Carefully place the appropriate key cap in position on the keyboard, taking care to place the plastic alignment pin in the correct position so that the key cap is the right way up and reads correctly.

NOTICE Depending on the used version, it might be possible that you have to cut off the pins of the larger keys (such as the Shift key) before mounting them.

2.) Push the key cap down until it snaps into position.
3.) Power On/Boot Up the system; see: Section 3-6-2 on page 3-47.
4.) Setup the Keyboard Language Layout as described in Section 6-6 on page 6-10 and then type with the keyboard to check the function of each key.

Section 8-14
Replacement of the Caps for TGC Sliders and/or Rotation Digipots

8-14-1 Manpower

One person, 5 minutes

8-14-2 Tools

none (poss. small-sized slotted screwdriver or tweezers)

8-14-3 Caps for TGC Sliders and/or Rotation Digipots - Replacement Procedure

1.) Remove the caps for Slider-potentiometer TGC (and/or Rotation Digipots).

NOTE: Don't loose integrated metal spring in each Rotation Digipot cap.

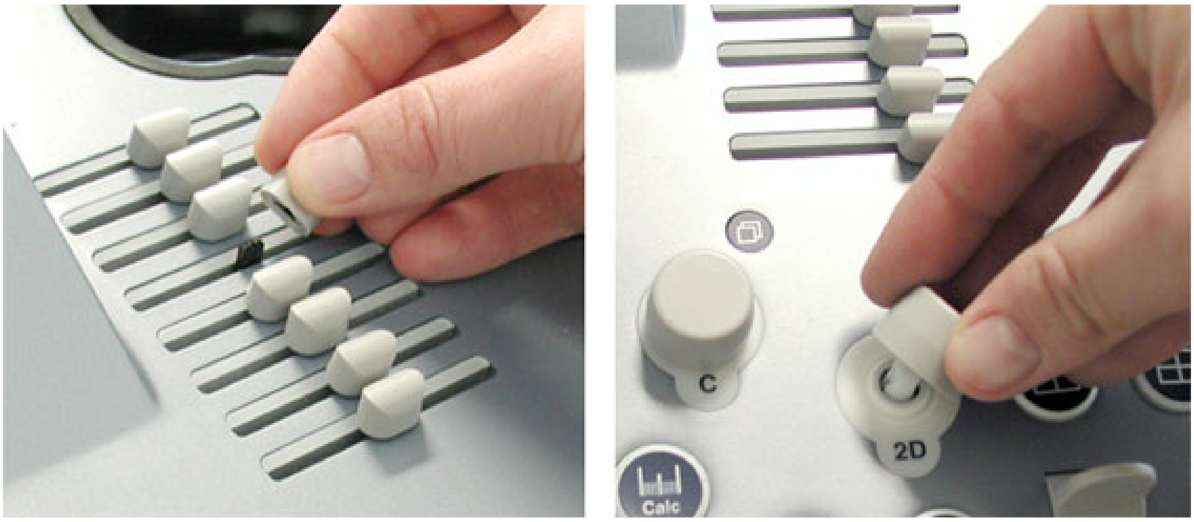


Figure 8-24 remove caps

2.) Mount the caps for Slider-potentiometer TGC (and/or Rotation Digipots).

Section 8-15
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, refer to: Section 8-15-1 on page 8-22
• if trackball buttons or mode key slices have to be replaced too, please contact your local distributor or GE service representative.

8-15-1 Replacement of Circle Key Caps only

8-15-1-1 Manpower

One person, approx. 1 minute/cap

8-15-1-2 Tools

small-sized slotted screwdriver or tweezers

8-15-1-3 Circle Key Caps - Replacement Procedure

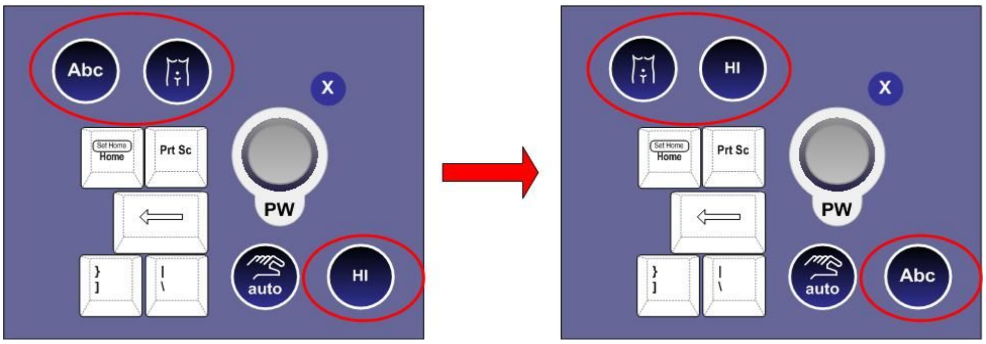
1.) By means of a small slotted screwdriver, carefully push against the circle hardkey cap.
2.) Lift the cap, until it is completely loosened from its base.

Figure 8-25 push against the circle cap and lift it

3.) Place the new hardkey cap down until it snaps into position.

NOTICE If the RTU3 Console (KTZ300207) is to be used on a BT06 system, **some hardkey caps have to be changed**! Please observe location of these 3 hardkeys on the control console (depend on BT-version).

BT06 **BT08**



Section 8-16
Replacement of the Monitor Transportation Lock

8-16-1 Manpower

One person, 2 minutes

8-16-2 Tools

Philips screwdriver 1 and 2

8-16-3 Monitor Transportation Lock - Removal Procedure

1.) Unscrew 1 screw, then remove the Monitor Transportation Lock.

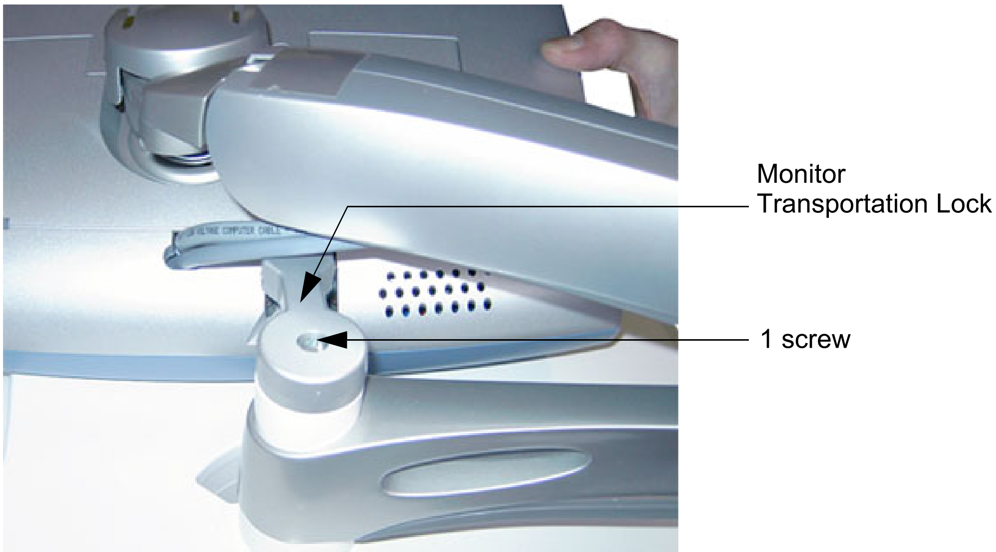


Figure 8-26 remove 1 screw

8-16-4 Monitor Transportation Lock - Installation Procedure

1.) Attach the new Monitor Transportation Lock and fasten it with 1 screw.

Section 8-17
Replacing optional Peripherals / How to mount Peripherals at a later date

NOTICE Normally auxiliary devices and peripherals come pre-installed with the Voluson® E8 system.

8-17-1 Manpower

One person, 30 - 50 minutes (depending on auxiliary device)

8-17-2 Tools

slotted screwdriver

Table 8-3 below outlines how to replace optional peripherals, or how to mount them at a later date

Table 8-3 replacing/mounting optional peripherals

Sub-section	Description	Page Number
8-17-3	Mounting/Replacing the VGA Image (Video) Resizer	8-25
8-17-4	Mounting/Replacing the 19” LCD Secondary “Patient” Monitor	8-27

NOTICE The VGA Image (Video) Resizer is required whenever the used Secondary “Patient” Monitor has a different screen resolution than the Voluson® E8 system!

CAUTION **A Secondary “Patient” Monitor MUST NEVER be connected to the Voluson® E8 ultrasound systems mains supply directly!**
Always connect it to an appropriate Isolation Transformer (see: Table 9-20 on page 9-34)!

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

8-17-3 Mounting/Replacing the VGA Image (Video) Resizer

NOTICE The VGA Image (Video) Resizer is required whenever the used Secondary "Patient" Monitor has a different screen resolution than the Voluson® E8 system!

8-17-3-1 Preparations

1.) Power Off/Shutdown the system as described in Section 4-3-2 on page 4-4.

8-17-3-2 Installation Procedure

NOTICE Following steps describe, how to install the VGA Image Resizer (if it was not mounted before).

1.) Peel off the protective film from the adhesive tapes (on Power Supply) and fix the Power Supply onto the Image Resizer Box.

2.) Peel off the protective film from the adhesive tapes (on bottom of Image Resizer Box) and fix the complete package on the shelf at the rear side of the system (see: Figure 8-27 below).

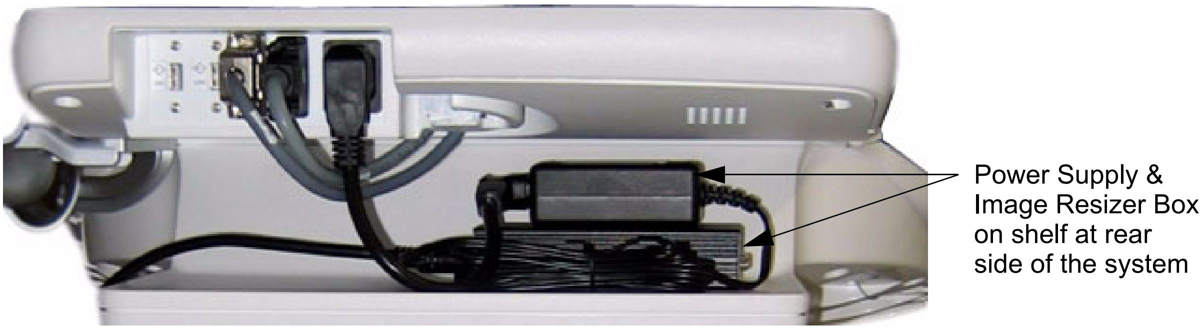


Figure 8-27 Power Supply and Image Resizer on shelf at rear side of the system

3.) Connect the RGB Video Cable from the ***VGA Out*** Connector (on Voluson® E8 system) to the ***PC/HD IN*** Connector on the Image Resizer Box (see: Figure 8-28 below).

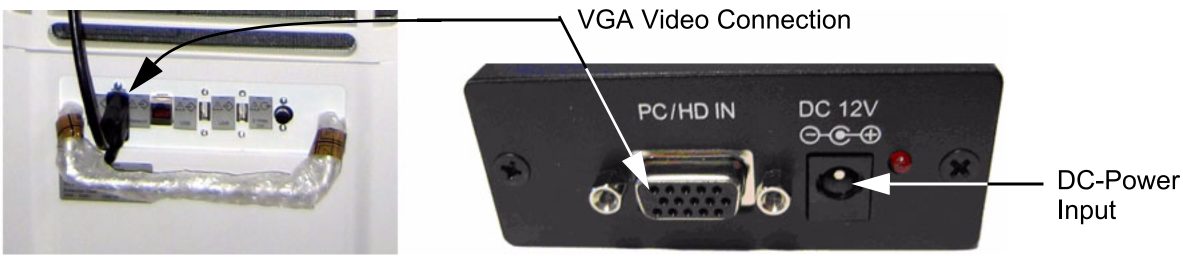


Figure 8-28 VGA Video Connection

NOTICE Place the cable in a way, that it can not get damaged when moving the System or when the height of the User Interface gets adjusted.

4.) Connect the DC-Power Output from the Power Supply to the DC-Power Input at the Image Resizer Box (see: Figure 8-28 above).

8-17-3-2 Installation Procedure (cont'd)

5.) Plug the Power Cable into the Power outlet above this shelf and plug the other end into the Power Supply's input socket (see: Figure 8-29 below).

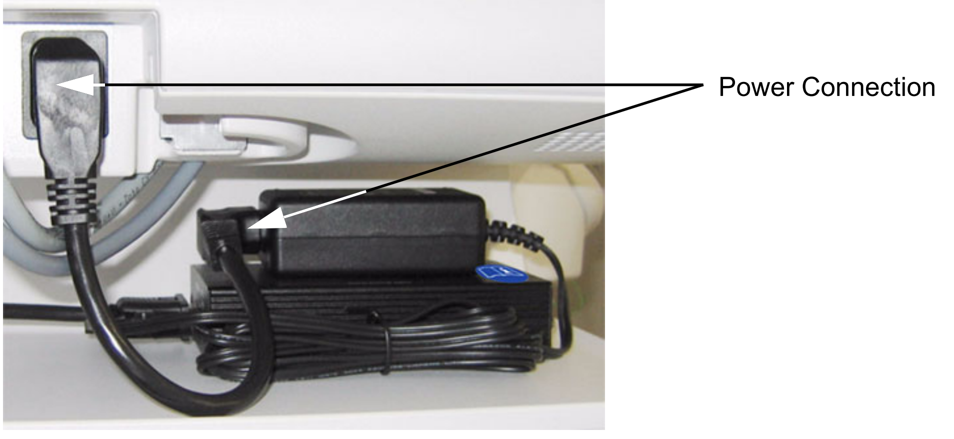


Figure 8-29 Power Connection

6.) Connect your Secondary Monitor to the Image Resizer Box at its ***PC/HD OUTPUT*** Connector.

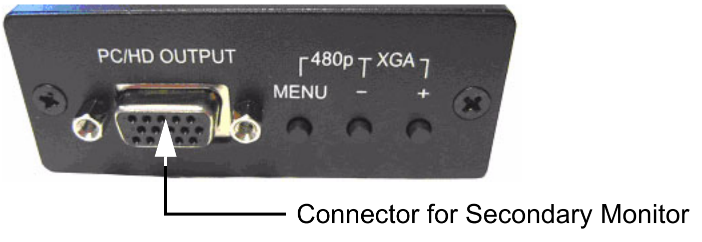


Figure 8-30 Connector for Secondary Monitor

7.) After the installation, Power ON/Boot up the system as described in Section 3-6-2 on page 3-47.
8.) Adjust the VGA Image Resizer settings as described in Section 3-5-8-1 on page 3-40.
9.) Measure leakage currents according to IEC 60601-1 respectively UL 60601-1.

8-17-4 Mounting/Replacing the 19” LCD Secondary “Patient” Monitor

NOTICE The 19” LCD Secondary “Patient” Monitor is **NOT intended for diagnostic use**. It is an additional device used to allow the patient to watch the proceedings.

8-17-4-1 Wall Bracket Mount

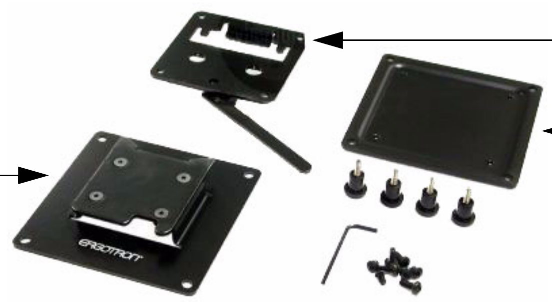


Figure 8-31 Wall Mount kit for 19” LCD Secondary Monitor

1.) Find out the exact position required, so patients can observe the monitor easily.

NOTICE Take your time to think about the best wall mount position of the monitor in your facilities. Patients should be able to view the monitor easily and without having to bend or turn around.

WARNING ***Because vertical surfaces vary widely and the ultimate mounting method is out of the manufacturer´s control, it is imperative that you consult with appropriate engineering, architectural or construction personnel to ensure that the bracket is mounted properly to handle applied loads. Use appropriate screws and wall dowels.***

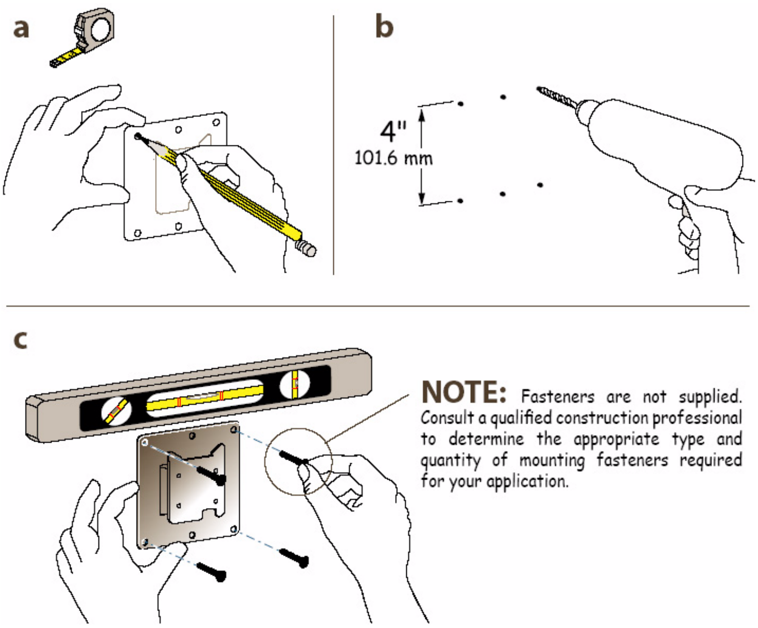


Figure 8-32 wall bracket mount

a.) Mark all the holes of the bracket mount on the wall. Make sure it is level.

b.) Drill the holes, using an electric drill.

c.) Fix the wall bracket mount by means of appropriate screws and wall dowels.

8-17-4-2 Preparing the Secondary Monitor

1.) Unpack the monitor. If mounted, remove the monitor base.
2.) Place the monitor flat and screen down on a table.
3.) Unscrew the the 4 screws (see: left image in Figure 8-33 below).

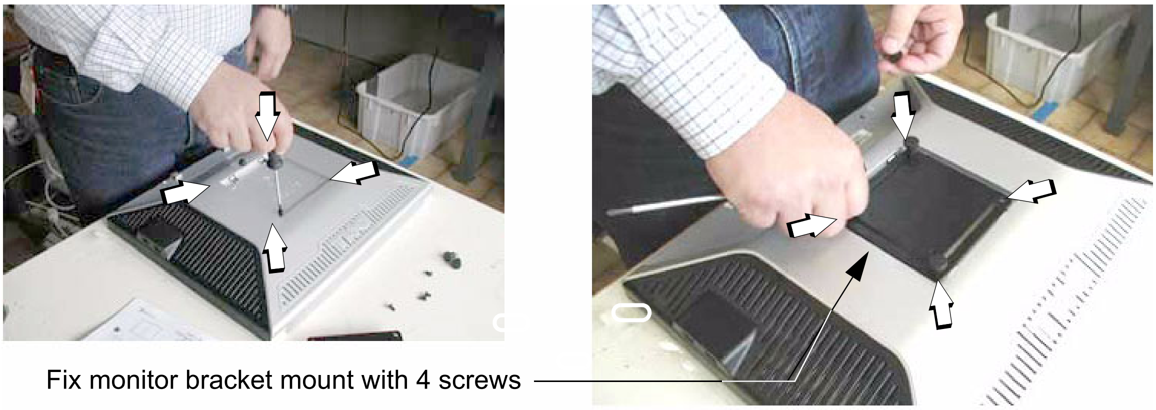


Figure 8-33 remove screws and then fasten monitor bracket mount

4.) Place the monitor bracket mount and fix it with 4 screws (see: right image Figure 8-33 above).
5.) Put the mounting plate on top of the monitor bracket mount and fix it with 4 Allen screws.

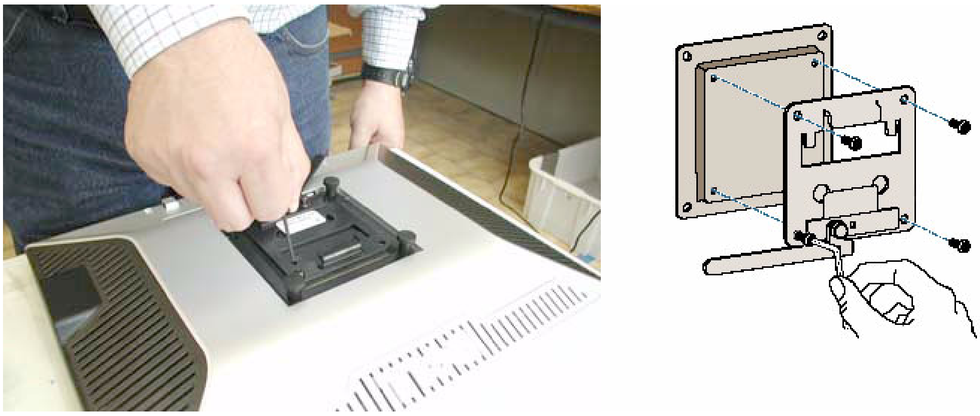


Figure 8-34 fix the mounting plate on top of the monitor bracket mount

6.) Plug in the supplied Power cable and the VGA cable to the appropriate connectors of the monitor.

Figure 8-35 plug in the supplied cables

8-17-4-3 Mounting and Locking Procedure

1.) Put the hook of the monitor bracket mount in the indention of the wall bracket mount.
2.) Rotate the locking lever until it is vertical. Now the monitor is mounted and secure.

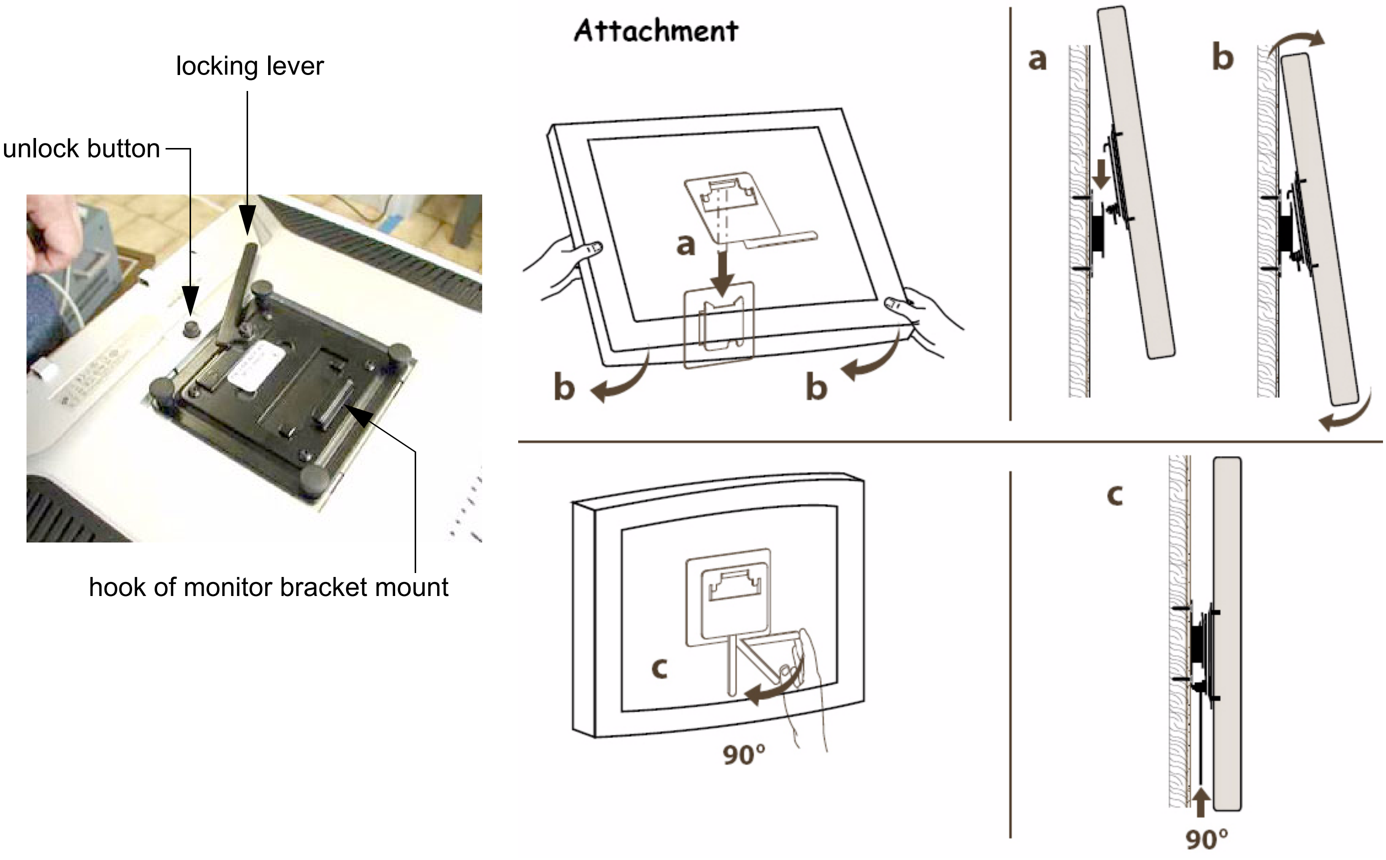
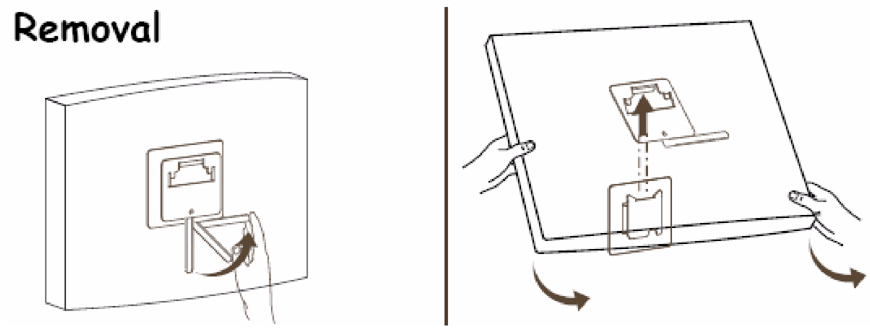


Figure 8-36 Mounting and Locking procedure

NOTE: To rotate the lever to its locking position, press the unlock button on rear of monitor, see: Figure 8-36.



8-17-4-4 Preparing the Isolation Transformer

Figure 8-37 Isolation Transformer kit for 19" LCD Secondary Monitor

1.) Before using the Isolation Transformer you must check the input voltage settings to meet the ratings of the line power available in your location or country.

NOTICE The wrong fuses and position of the voltage output selector may cause major damage on connected peripherals.

2.) For changing the input voltage, open the fuse protection at the power inlet block with a small screwdriver and remove the fuse holder.

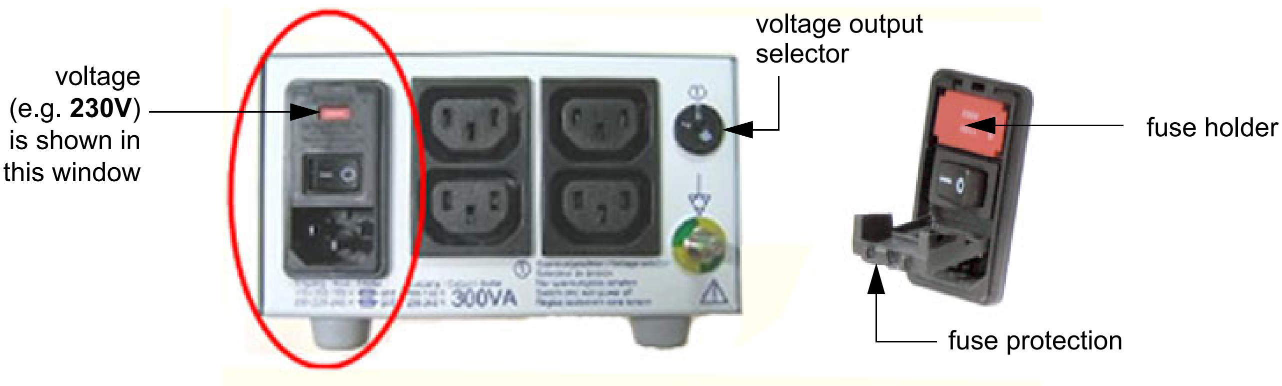


Figure 8-38 changing input voltage

3.) By turning the fuse holder you can select 115V or 230V.
Consider that changing the input voltage also requires to change the fuses!

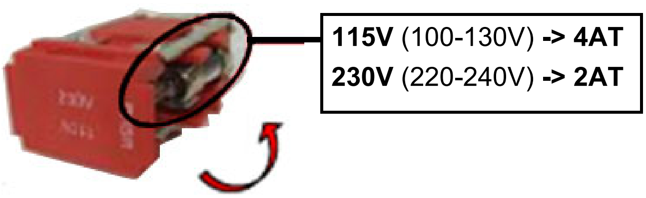


Figure 8-39 input voltage setting

8-17-4-4 Preparing the Isolation Transformer (cont'd)

4.) Push the fuse holder back into position (correct voltage should be shown in upper line; e.g, 230V, see: Figure 8-40 below) and then close fuse protection.

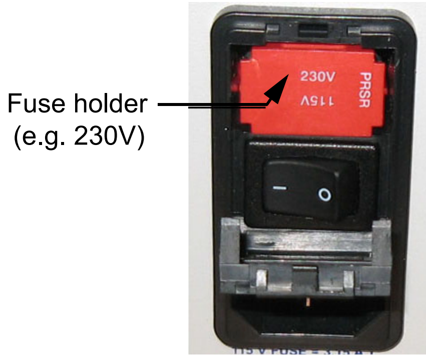


Figure 8-40 change fuses of isolation transformer

NOTE: The adjusted voltage is shown in the viewing window (see: Figure 8-41 below).

5.) The output voltage must also be changed by the turn switch, which is located on the right side. For that purpose use an appropriate screwdriver and make sure the transformer is switched off.

- for an Input voltage range of **100-130V** set position **A**
- for an Input voltage range of **220-240V** set position **B**

Figure 8-41 output voltage setting

6.) Assure that the connected loads can be operated with the chosen voltage.

8-17-4-5 Connection of 19” Secondary Monitor and Isolation Transformer

NOTICE DO NOT connect the 19” LCD Secondary Monitor to the Voluson® E8 via USB cable.
Use the supplied VGA cable.

CAUTION **The 19” LCD Secondary “Patient” Monitor MUST NEVER be connected to the Voluson® E8 ultrasound systems mains supply directly!**
Always connect it to the supplied Transformer)!

The Secondary Monitor is the only item to be connected to the Transformer.

NOTICE The transformer must be out of the reach of the patient.
However, it needs to be within cable length from the monitor and a socket.

The transformer is IPX 0. There is no protection against ingress of liquids!

NOTICE All necessary modifications to wall and buildings must be performed by a professional to avoid structural damage and electrical hazard.

NOTE: *For connection scheme refer to Figure 3-36 on page 3-42.*

1.) Depending on the Voluson® E8 BT-version, plug the VGA cable (from Secondary Monitor) to:
• the ***VGA Out*** connector on the external I/O connector panel (GES) on the rear of the system **or**
• the ***PC/HD OUTPUT*** connector of the VGA Image Resizer box.

2.) Prepare the isolation transformer as described in Section 8-17-4-4 on page 8-30.

3.) Place the isolation transformer on the floor or mount it on the wall.

4.) Plug the Power cable (from Secondary Monitor) to the isolation transfomer.
The Power cable of the transformer itself connect to a wall socket.

5.) Use this power switch to power on the Transformer.

NOTE: *Wait ~1 minute before turning on your monitor.*

6.) Press the main power switch on the Secondary Monitor.

7.) Power ON/Boot up the system as described in Section 3-6-2 on page 3-47.

8.) Compare the picture on the newly installed monitor with the picture on the Voluson® E8 monitor.

NOTE: *If you need to change the configuration of the newly installed monitor, please, refer to the manual of the Secondary Monitor, which is enclosed in the Wall mount kit.*

9.) Measure leakage currents according to IEC 60601-1 respectively UL 60601-1.

NOTE: *The monitor needs to be switched of seperately at the main power switch of the monitor.*

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® E8 ultrasound system.

NOTE: *Furthermore refer to **SN79040**, which is the best source for new FRU parts that are not yet implemented in this Service Manual.*

Table 9-1 Contents in Chapter 9

Section 9-2
List of Abbreviations

AC	Alternating Current
ADC	Analog to Digital Converter
ASIC	Application Specific Integrated Circuit
Assy	Assembly
BEP	Back End Processor
CPU	Central Processing Unit
CSD	Common Service Desktop
DAC	Digital to Analog Converter
DC	Direct Current
DSP	Digital Signal Processing
DVI	Digital Visual Interface
EUM	Electronic User Manual
FEP	Front End Processor
FRU 1	Replacement part available in parts hub
FRU 2	Replacement part available from the manufacturer (lead time involved)
GBF	Beamformer Module
HDD	Hard Disk Drive
HVPS	High Voltage Power Supply
Int	Internal
I/O	Input/Output
LCD	Liquid Crystal Display
LVPS	Low Voltage Power Supply
MAN	ECG Module
PCI	Peripheral Component Interconnect
PWA	Printed Wire Assembly
RFI	Radio Frequency Interface "Controller" board
RSR	Receiver Sub-board on Beamformer Motherboard (RTM)
RST	Transmitter Sub-board on Beamformer Motherboard (RTM)
RSW	CW-Doppler (Continuous Wave) Board
RTB	Distribution Board Bottom
RTF	Probe Control Board
RTH	Distribution Board USB-Hub
RTK	Motherboard
RTN	Power Supply Primary Module
RTM	Beamformer Motherboard
RTP	Power Supply Secondary Module
RTT	Distribution Board Top
RTU	Control Console
RTV	Video Converter Board
SMBus	System Management Bus
UIS	Ultrasound Application Software

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
100- 110-	Housing - Mechanical Hardware Parts & Covers • Housing - Mechanical Hardware Parts & Covers cont´d	Table 9-3 on page 9-4 Table 9-4 on page 9-5	Housing Covers (except UI and Monitor), Caster Wheels, Handle
200-	User Interface • User Interface cont´d	Table 9-5 on page 9-7 Table 9-6 on page 9-9	Console (keyboard, trackball, display, special knobs and switches) Loudspeakers, Disk Drive, Probe holder, Console Covers, etc.
300-	Monitor + Monitor Replacement Parts	Table 9-7 on page 9-11	Monitor + Monitor replacement parts
400-	Main Power Modules	Table 9-8 on page 9-12	Primary and Secondary Power Supply Modules
500- 550-	Main Board Module • FrontEnd (US-Part) Components • FrontEnd (US-Part) Components cont´d • BackEnd (PC-Part) Components	Table 9-9 on page 9-13 Table 9-10 on page 9-14 Table 9-11 on page 9-16 Table 9-12 on page 9-18	Ultrasound (FrontEnd) Components Ultrasound (FrontEnd) Components cont´d PC-Part (BackEnd) Components
600-	Options and Upgrades • Options and Upgrades cont´d	Table 9-13 on page 9-19 Table 9-14 on page 9-20	Software Options and Upgrades
700-	Miscellaneous Cables	Table 9-15 on page 9-21	
800- 810- 820- 830-	Optional Peripherals and Accessories • Recording Tools • Printers • Drives & additional Devices • Optional Equipment	Table 9-16 on page 9-30 Table 9-17 on page 9-30 Table 9-18 on page 9-31 Table 9-19 on page 9-32 Table 9-20 on page 9-34	Video Recorder, DVD Recorder B/W Printer, Color Printer, DeskJet Printer USB Stick, HDD Drive, WLAN, etc. Footswitch, ECG, etc.
	System Manuals - Voluson® E8 / Voluson® E8 Expert	Table 9-21 on page 9-35	
900- 910- 920- 930- 940-	Probes • 2D curved array Transducers • 2D linear array Transducers • 2D phased array Transducers • Real-Time 4D Volume Probes • CW-Pencil Probes	Table 9-22 on page 9-36 Table 9-23 on page 9-37 Table 9-24 on page 9-38 Table 9-25 on page 9-39 Table 9-26 on page 9-41 Table 9-27 on page 9-42	
950	Biopsy Needle Guides	Table 9-28 on page 9-43	

Section 9-4
Housing - Mechanical Hardware Parts & Covers

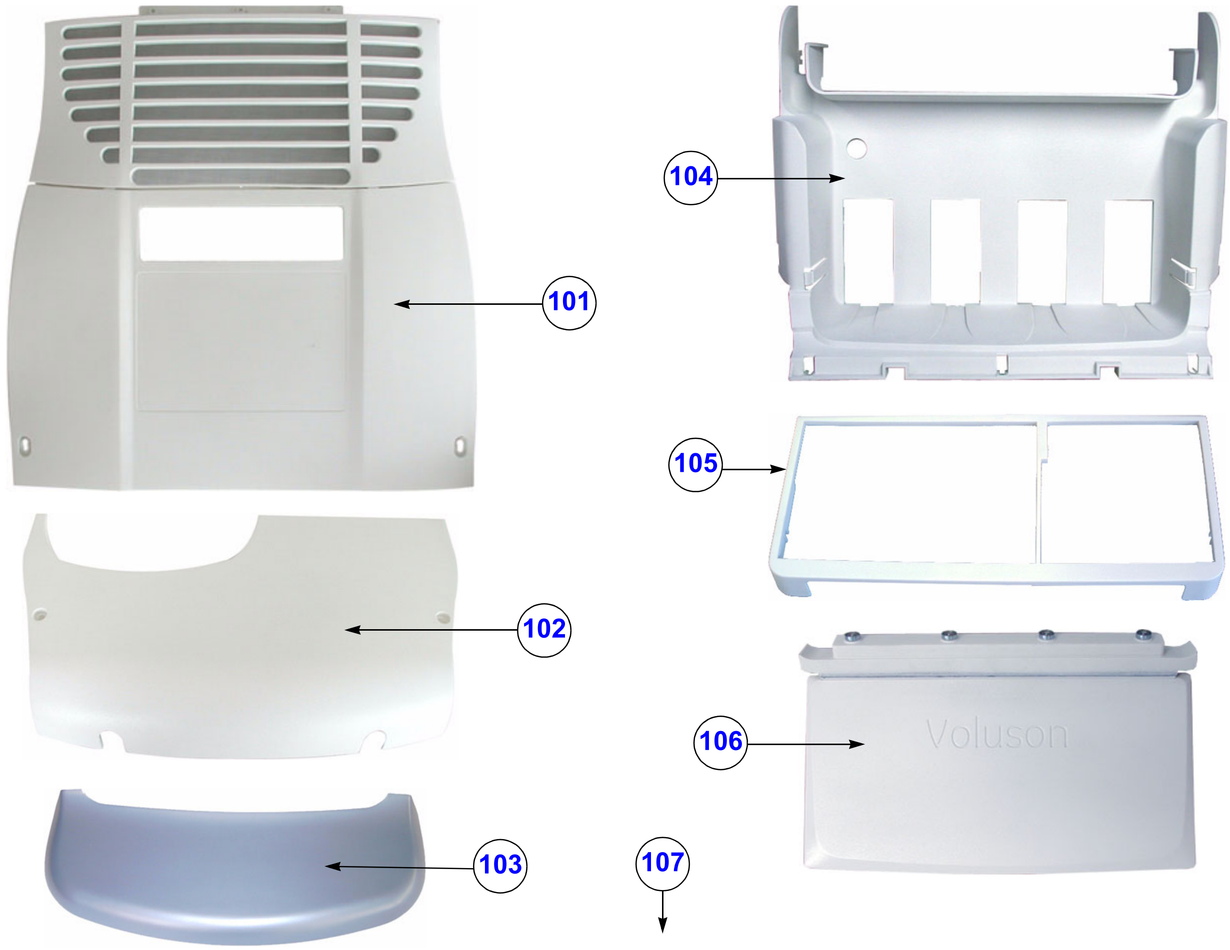


Figure 9-2 Housing - Mechanical Hardware Parts & Covers

Table 9-3 Housing - Mechanical Hardware Parts & Covers

Item	Part Name	Part Number	Description	Qty	FRU
101	Back Cover	KTZ134641	Back Cover incl. Filter Grid for Voluson® E8	1	1
102	Back Top Cover	KTZ134644	Back Top Cover for Voluson® E8	1	1
103	Footrest Cover	KTZ134633	Footrest Cover for Voluson® E8	1	1
104	Front Cover	KTZ134639	Front Cover (Beamformer) for Voluson® E8	1	1
105	Front Frame	KTZ134637	Front Frame for Voluson® E8	1	1
106	Voluson Cover	KTZ134696	Voluson Cover for Voluson® E8	1	1
107	Small parts kit	KTZ280053	“odds and ends” kit incl. spring sheet & friction ring at Magnetic brake (3 pcs. each), quick release devices for locking the footrest cover (4 pcs.), GE label (2 pcs.) + different screws (40 pcs.)	-	1

BT Version: The Spring Sheet and Friction Ring (contents of “odds and ends” kit KTZ280053) are **BT06 only**.

Section 9-4 Housing - Mechanical Hardware Parts & Covers (cont'd)

Figure 9-3 Housing - Mechanical Hardware Parts & Covers (cont´d)

Table 9-4 Housing - Mechanical Hardware Parts & Covers (cont´d)

Item	Part Name	Part Number	Description	Qty	FRU
111	Handle (rear)	KTZ134638	rear Handle for Voluson® E8	1	1
112	Hook Connector	KTZ134642	Hook Connector for Voluson® E8	1	1
113	Side Cover incl. Door (left)	KTZ196218	left Side Cover incl. Door for Probe cables	1	1
114	Side Cover incl. Door (right)	KTZ196224	right Side Cover incl. Door for Probe cables	1	1
115	Top Cover	KTZ134643	Top Cover for Voluson® E8	1	1
116	Caster (back)	KTZ220492	back Caster Wheel non-steerable, **1** pcs.	2	1
117	Caster (front)	KTZ220491	front Caster Wheel steerable, **1** pcs. (**BT06 only**) replaced by KTZ220869	2	1
118	Caster (front) version 2	KTZ220869	front Caster Wheel steerable(1 pcs.) can replace KTZ220491 swivel lock is only possible if wheel is set towards the front	2	1
119	Caster anti-twist protection	KTZ154807	anti-twist protection for front Caster Wheel (KTZ220491), **2** pcs.	2	1

Section 9-5
User Interface

Figure 9-4 User Interface

Table 9-5 User Interface

Item	Part Name	Part Number	Description	Qty	FRU
201	Cable Holder	KTZ134656	Probe Cable Holder (1 pcs.) for Voluson® E8	2	1
202	Probe Holder Kit	KTZ134697	Probe Holder Kit (inset 1-4) for Voluson® E8	1	1
203	Probe Holder for Endocavity probes	KTZ134657	Holder for Endocavity probes	1	1
204	Caps for TGC Sliders (8 pcs.)	KTZ220870	Caps for TGC Slide potentiometers (set includes 8 pieces with premounted brackets)	8	1
205	Caps for Rotation digipots (10 pcs.)	KTZ220871	Caps for Rotation digipots (set includes 10 pieces with premounted brackets)	10	1
206	Caps for Hardkeys	KTZ220872	set includes all caps for hardkeys on the Voluson® E8 Console, **obsolete:** replaced by KTZ300424	1	1
207	Caps for Hardkeys 2	KTZ300424	set includes all caps for hardkeys on the Voluson® E8 RTU3 Console, can replace KTZ220872	1	1
208	Caps for Keyboard keys	KTZ220873	set includes all caps for alphanumeric keyboard keys on the Voluson® E8 Console, **obsolete:** replaced by KTZ300425	1	1
209	Caps for Keyboard keys 2	KTZ300425	set includes all caps for alphanumeric keyboard keys on the Voluson® E8 RTU3 Console, can replace KTZ220873 *Note:* When using on a BT06 system, the keyboard key caps [F6] and [F8] have to be (ex)changed!	1	1
210	Console Rubber bar 1.8m	KTZ220621	Console Rubber bar 1.8m (sealing between Console Cover and Trolley)	1	1
211	Console Back Cover	KTZ134646	Console Back Cover for Voluson® E8	1	1
212	RTU2-2a Console	KTZ220504	Voluson® E8 Console (**BT06 only**) incl. English keyboard, trackball, display, special knobs and switches **obsolete:** replaced by RTU3 (KTZ300207)	1	1
213	RTU2b Console	KTZ220966	Voluson® E8 Console incl. English keyboard, trackball, display, special knobs and switches **obsolete:** replaced by RTU3 (KTZ300207)	1	1
214	RTU3 Console	KTZ300207	Voluson® E8 Console incl. English keyboard, trackball, display, special knobs and switches; replaces RTU2-2a (KTZ220504) and RTU2b (KTZ220966) *Compatibility:* If this Console is to be used on a BT06 system, some keyboard and hardkey caps **have to be** (ex)changed!	1	1
215	Console Front Handle	KTZ280106	Console Front Handle for Voluson® E8 2 parts (upper and bottom part)	1	1
216	TGC-Slide potentiometers	KTZ220874	TGC-Slide potentiometers	1	1
217	Trackball Kit	KTZ220867	optical sampling Trackball Kit for Voluson® E8, generates X-Y- Coordinates of Trackball-Movements like moving a PC-Mouse **obsolete:** replaced by KTZ280063	1	1
218	Trackball Kit 2	KTZ280063	laser sampling Trackball Kit for Voluson® E8, generates X-Y- Coordinates of Trackball-Movements like moving a PC-Mouse; can replace KTZ220867	1	1
219	Trackball Ring	KTZ220868	Trackball fixation ring	1	1
220	Digipot Encoder	KTZ220875	Digipot Encoder (**1** pcs.)	10	1

BT Version: Please observe that replacement parts might be different; dependent on BT-version.

Section 9-5 User Interface (cont'd)

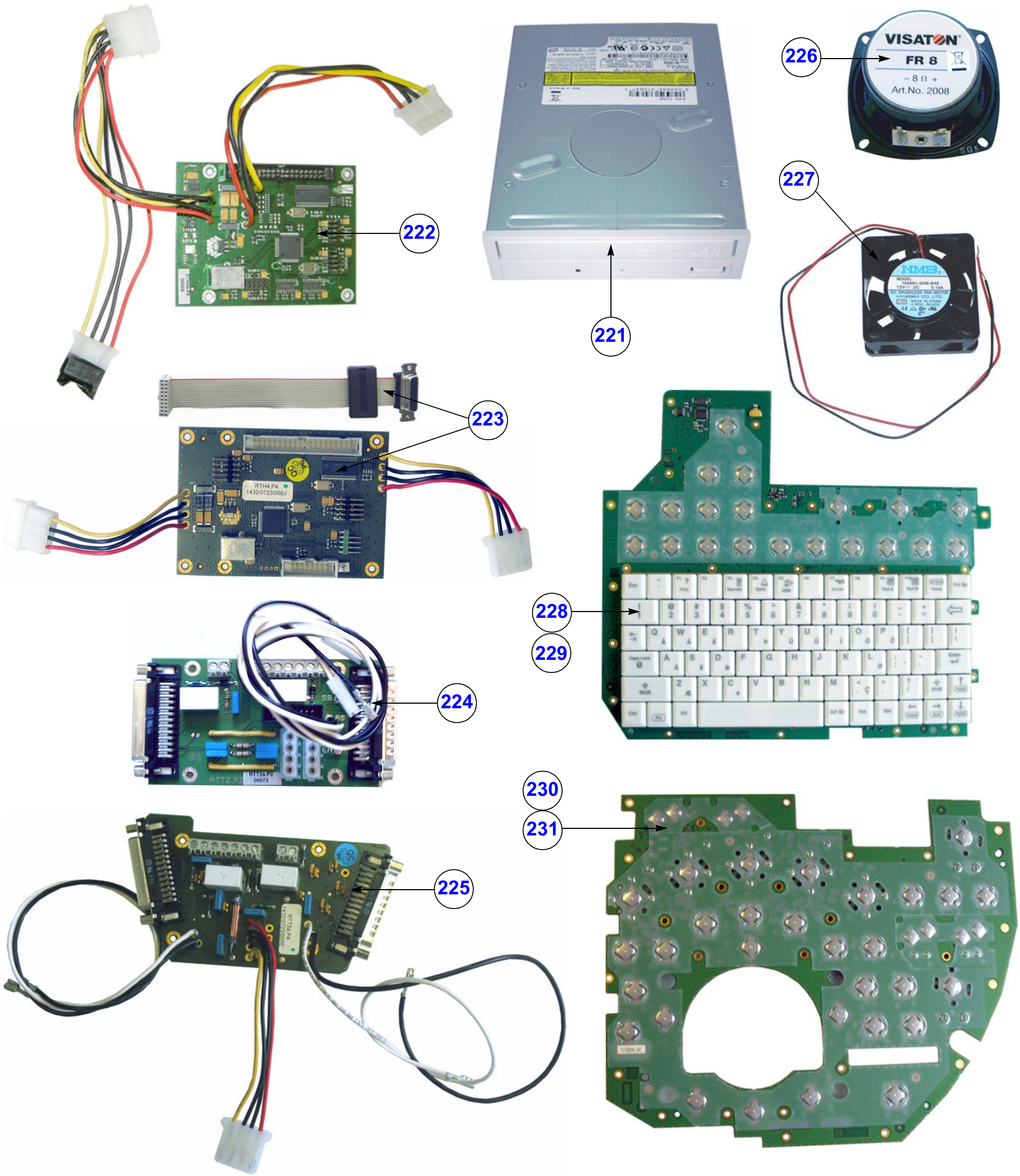


Figure 9-5 User Interface (cont'd)

Table 9-6 User Interface (cont'd)

Item	Part Name	Part Number	Description	Qty	FRU
221	Disk Drive IDE DVD+(R)W	KTZ207257	DVD+(R)W Writer internal (no own cabinet)	1	1
222	RTH1-3.P1-3 - Distribution Board USB-Hub	KTZ220502	Distribution Board USB-Hub (**BT06 only**) *Compatibility:* can be replaced by RTH4 (KTZ221015), if RTT is also exchanged	1	1
223	RTH4.P4 - Distribution Board USB-Hub incl. Power connection cable for Monitor	KTZ221015	Distribution Board USB-Hub *Compatibility:* can replace RTH1-3 (KTZ220502), if RTT is also exchanged	1	1
224	RTT1-2a.P1-2 - Distribution Board Top	KTZ220503	Distribution Board Top (**BT06 only**) *Compatibility:* can be replaced by RTT3 (KTZ221014), if RTH is also exchanged	1	1
225	RTT3.P3 - Distribution Board Top	KTZ221014	Distribution Board Top *Compatibility:* can replace RTT1-2 (KTZ220503), if RTH is also exchanged	1	1
226	Loudspeaker Top Console	KTZ208132	Loudspeaker on User Interface (1 pcs.)	2	1
227	Fan User Interface	KTZ220645	Fan User Interface	1	1
228	Console Alphanumeric board	KTZ220865	Alphanumeric keyboard - English, (check if special key cap kit is needed; see: Table 9-14 on page 9-20) can be replaced by KTZ280064	1	1
229	Console Alphanumeric board 2	KTZ280064	Alphanumeric Keyboard - English, (check if special key cap kit is needed; see: Table 9-14 on page 9-20) can replace KTZ220865 *Note:* When using on a BT06 system, the keyboard key caps [F6] and [F8] have to be (ex)changed!	1	1
230	Console Interface Board	KTZ220866	Console Interface Board can be replaced by KTZ280065	1	1
231	Console Interface Board 2	KTZ280065	Console Interface Board can replace KTZ220866	1	1

BT Version: Please observe that replacement parts might be different; dependent on BT-version.

NOTICE Pay attention to **combination of RTH and RTT** boards version! (RTH1-3 **&** RTT1-2 ; RTH4 **&** RTT3) i.e.: if a board has to be replaced, it might be possible that the matching board has to be exchanged too!

Section 9-6
Monitor + Monitor Replacement Parts

Figure 9-6 Monitor + Monitor replacement parts

Table 9-7 Monitor + Monitor replacement parts

Item	Part Name	Part Number	Description	Qty	FRU
301	Monitor Color LCD 15” complete	KTZ154773	15” Color Image LCD Monitor complete for Voluson® E8 (**BT06 only**)	1	1
302	Monitor Color LCD 19” complete	KTZ154812	19” Color Image LCD Monitor complete for Voluson® E8 (**BT08 only**)	1	1
303	Monitor Arm 15”	KTZ154774	Holder for Voluson® E8 15” Monitor (**BT06 only**)	1	1
304	Monitor Arm 19”	KTZ154817	Holder for Voluson® E8 Monitor can replace 15” Monitor holder (KTZ154774)	1	1
305	Monitor Cable Set (2 cables)	KTZ196912	Monitor Cable Set (Power Cable and Video Cable)	1	1
306	Monitor Transportation Lock	KTZ134707	Monitor Transportation Lock	1	1

BT Version: Please observe that replacement parts might be different; dependent on BT-version.

Section 9-7
Main Power Modules

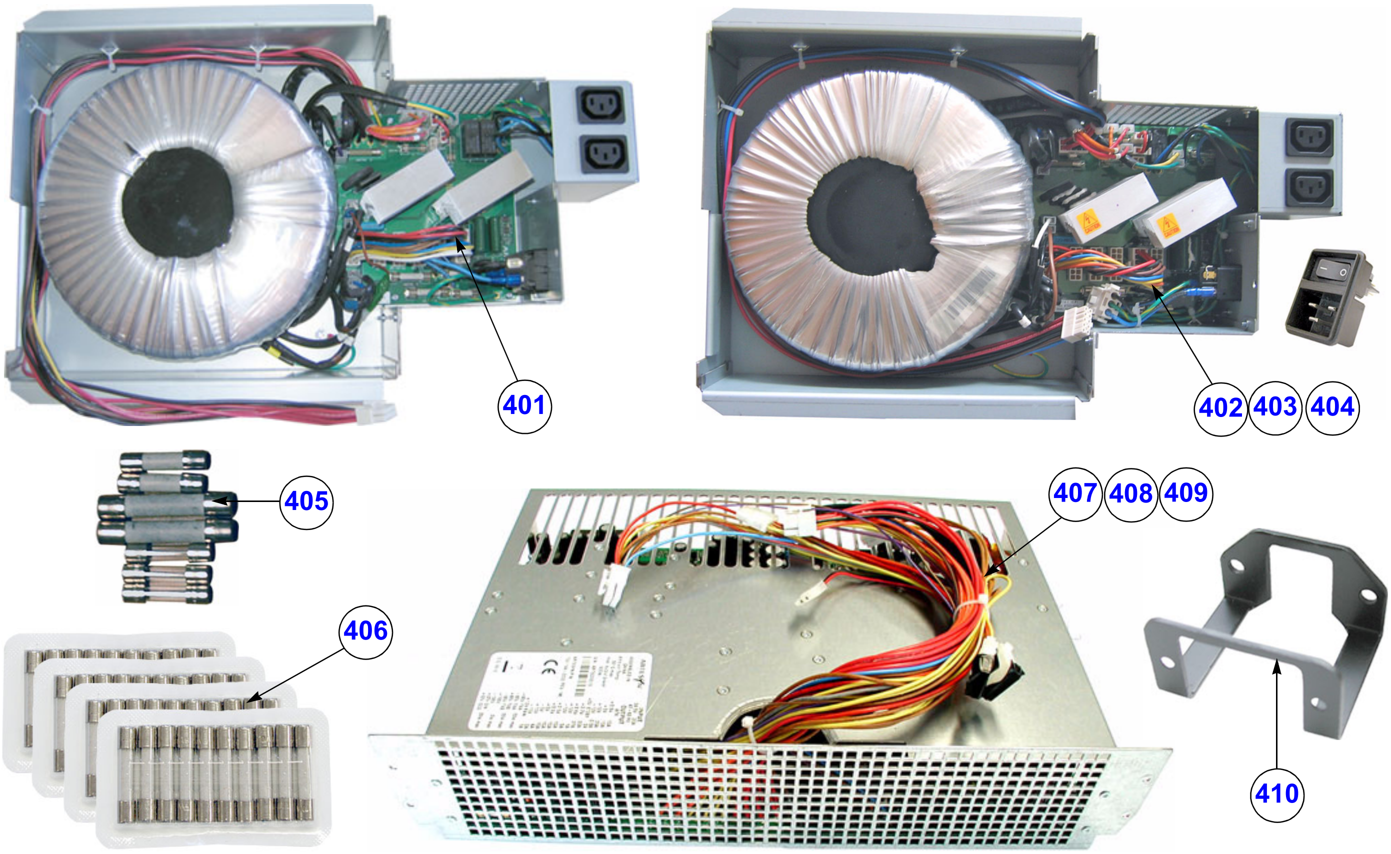


Figure 9-7 Main Power Module

Table 9-8 Main Power Module

Item	Part Name	Part Number	Description	Qty	FRU
401	RTN2 - Primary Power Supply	KTZ220484	Primary Power Supply Module (RTN) incl. Mains Input Connector C20 (16A type) (**BT06 only**)	1	1
402	RTN3 - Primary Power Supply	KTZ220825	Primary Power Supply Module (RTN) incl. Mains Input Connector C14 (10A type) + C20 (16A type) (**BT06 only**) can replace RTN2 (KTZ220484)	1	1
403	RTN4 - Primary Power Supply	KTZ221028	Primary Power Supply Module (RTN) incl. Mains Input Connector C14 (10A type) + C20 (16A type), can replace RTN2 (KTZ220484) and RTN3 (KTZ220825), **but** fuse F1 has to be exchanged at BT06 systems	1	1
404	RTN5 - Primary Power Supply	KTZ300242	Primary Power Supply Module (RTN) incl. Mains Input Connector C14 (10A type) + C20 (16A type) can replace RTN2 (KTZ220484), RTN3 (KTZ220825) and RTN4 (KTZ221028), **but** fuse F1 has to be exchanged at BT06 systems	1	1

Table 9-8 Main Power Module

Item	Part Name	Part Number	Description	Qty	FRU
405	RTN Fuse Set	KTZ220530	Fuses for Primary Power Supply RTN (**BT06 only**)	1	1
406	RTN Fuse Set (BT08 onwards)	KTZ280043	Fuses for Primary Power Supply RTN (1.25A, 1.6A, 10A and 15A; 10 pcs. each = 40)	-	1
407	RTP1-4.P4 - Secondary Power Supply	KTZ220485	Secondary Power Supply Module RTP (**BT06 only**)	1	1
408	RTP5.P5 - Secondary Power Supply	KTZ221029	Secondary Power Supply Module RTP can replace RTP1-4 (KTZ220485)	1	1
409	RTP5a.P5 - Secondary Power Supply	KTZ280081	Secondary Power Supply Module RTP can replace RTP1-4 (KTZ220485) and RTP5 (KTZ221029)	1	1
410	Pull-out Protection for Mains Power cable	KTZ154717	Pull-out Protection for Main Power cable with C20 connector (16A type), incl. screws	1	1

BT Version: Please observe that replacement parts might be different; dependent on BT-version.

Section 9-8
Main Board Module

Table 9-9 below outlines the replacement parts described in the sub-sections.

Table 9-9 Main Board Module - Replacement Parts

Sub-section	Description	Page Number
9-8-1	FrontEnd (US-Part) Components	9-14
9-8-2	BackEnd (PC-Part) Components	9-17

9-8-1 FrontEnd (US-Part) Components

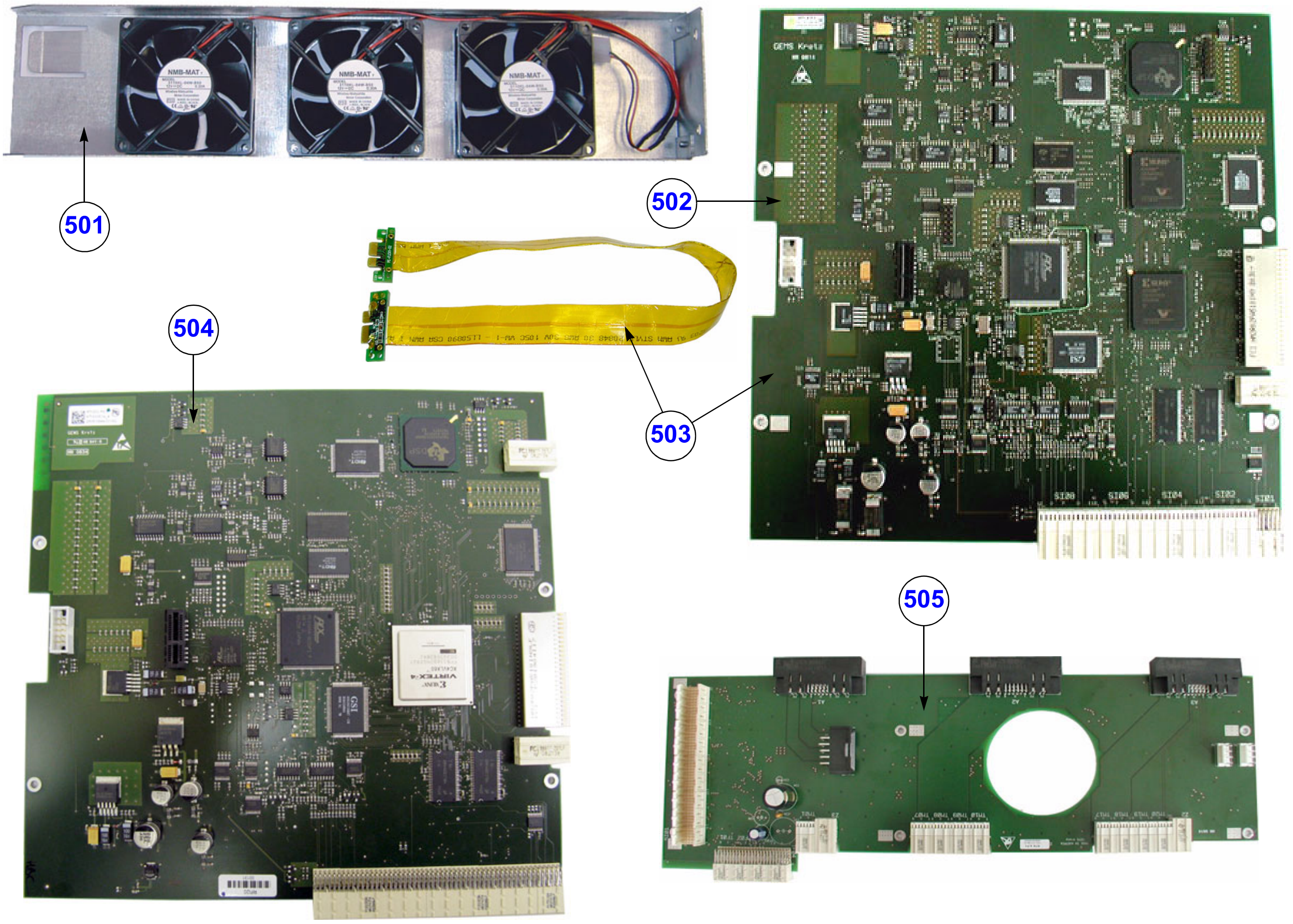


Figure 9-8 FrontEnd (US-Part) Components

Table 9-10 FrontEnd (US-Part) Components

Item	Part Name	Part Number	Description	Qty	FRU
501	Fan Tray (3 fan)	KTZ154770	Fan Tray (3 fan) - FrontEnd	1	1
502	RFI6-6g.P4 - RF-Interface Board	KTZ196142	Radio Frequency Interface “Controller” Board replaced by KTZ280052	1	1
503	RFI6-6i.P4 - RF-Interface Board + PCI-E Connection cable	KTZ280052	Radio Frequency Interface “Controller” Board + PCI-E Connection cable (RFI - BEP) replaces KTZ196142	1	1
504	RFI20c.P8 - RF-Interface Board	KTZ280098	Radio Frequency Interface “Controller” Board **BT08 only (SW7.0.4 or higher is required)**	1	1
505	RTK5-5c.P4 - Motherboard	KTZ196133	Electrical Signal- and Supply-Connection for all boards	1	1

9-8-1 FrontEnd (US-Part) Components (cont'd)

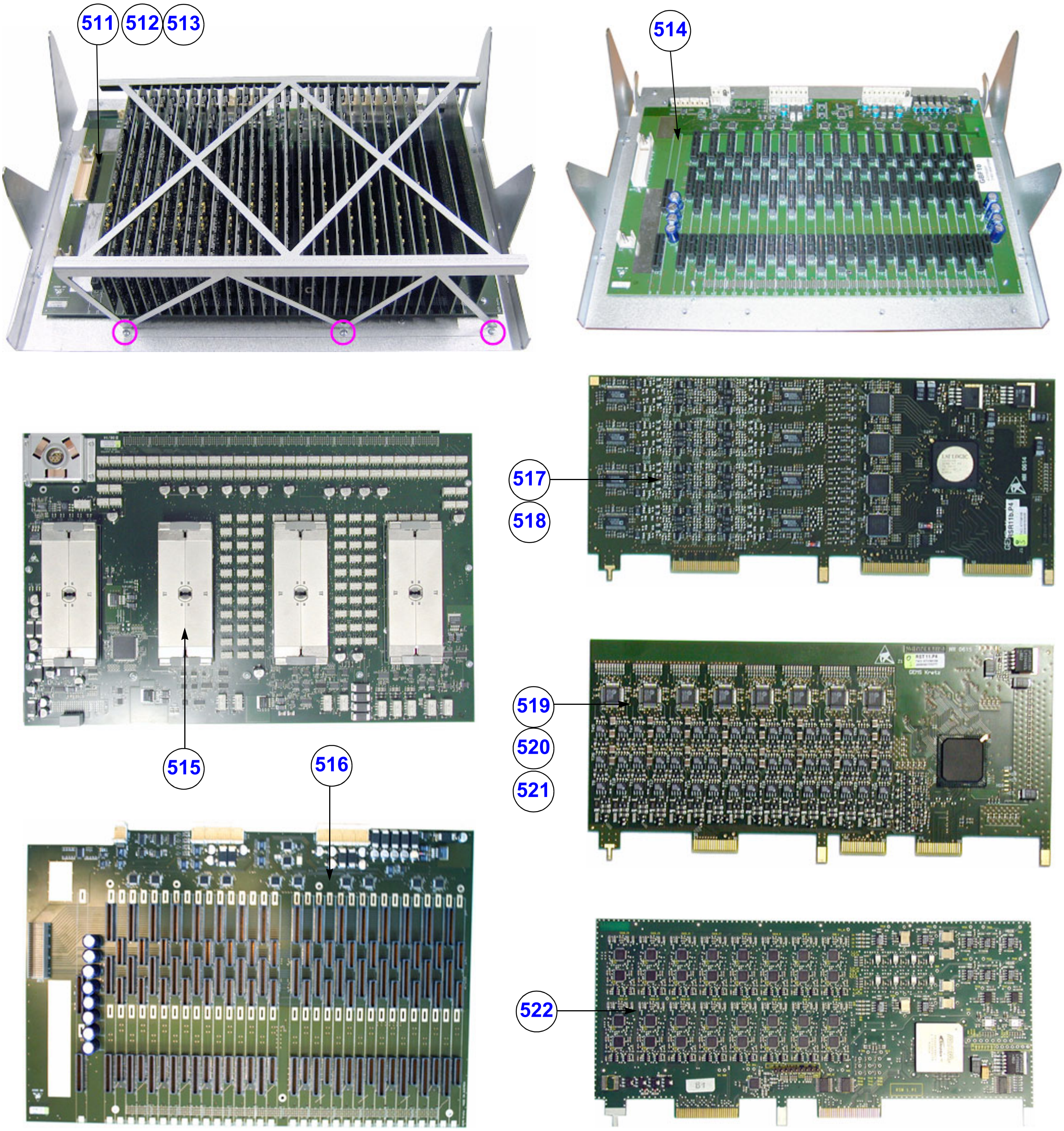


Figure 9-9 FrontEnd (US-Part) cont´d

Table 9-11 FrontEnd (US-Part) cont´d

Item	Part Name	Part Number	Description	Qty	FRU
511	GBF10 - Beamformer Module	KTZ196207	Beamformer Assembly including RTF, RTM, RST and RSR board(s) for Voluson® E8 (**BT06 only**) replaced by GBF11 (KTZ196356 or KTZ280082)	1	1
512	GBF11 - Beamformer Module HAL	KTZ196356	Beamformer Assembly including RTF, RTM, RST and RSR board(s) for Voluson® E8 replaced by GBF11 HAL-2 (KTZ280082)	1	1
513	GBF11 - Beamformer Module HAL-2	KTZ280082	Beamformer Assembly including RTF, RTM, RST and RSR board(s) for Voluson® E8 can replace GBF10 and GBF11 HAL	1	1
514	GBF10 - Beamformer Module without Sub-boards	KTZ196315	Beamformer Assembly including RTF and RTM; **without** any Sub-boards, can be used for all Voluson® E8 units	1	1
515	RTF3-3a.P3 - Probe Control Board	KTZ196163	Probe Connector Board, Module Board	1	1
516	RTM15-15a.P4 - Beamformer Motherboard	KTZ196221	Beamformer Motherboard	1	1
517	RSR14.P7 - Receiver Sub-board (1 pcs.)	KTZ196219	RX Sub-board on Beamformer Motherboard RTM (**BT06 only**) replaced by RSR14 HAL (KTZ196357)	16	1
518	RSR14.P9 - Receiver Sub-board HAL (1 pcs.)	KTZ196357	RX Sub-board on Beamformer Motherboard RTM replaces RSR14 (KTZ196219)	16	1
519	RST15.P5 - Transmitter Sub-board (1 pcs.)	KTZ196220	TX Sub-board on Beamformer Motherboard RTM (**BT06 only**) replaced by RST15 HAL (KTZ196358)	16	1
520	RST15.P6 - Transmitter Sub-board HAL (1 pcs.)	KTZ196358	TX Sub-board on Beamformer Motherboard RTM can replace RST15 (KTZ196220) *Compatibility:* It is possible to mix RST15 and RST20 within a Beamformer (GBF).	16	1
521	RST20.P8 - Transmitter Sub-board (1 pcs.)	KTZ280122	TX Sub-board on Beamformer Motherboard RTM can replace RST15 (KTZ196220 or KTZ196358) *Compatibility:* It is possible to mix RST15 and RST20 within a Beamformer (GBF).	16	1
522	RSW16-17a.P4-P6 - CW-Doppler Board	KTZ196088	CW-Doppler Board, optional (**BT08 only**)	-	1

BT Version: Please observe that replacement parts might be different; dependent on BT-version.

9-8-2 BackEnd (PC-Part) Components

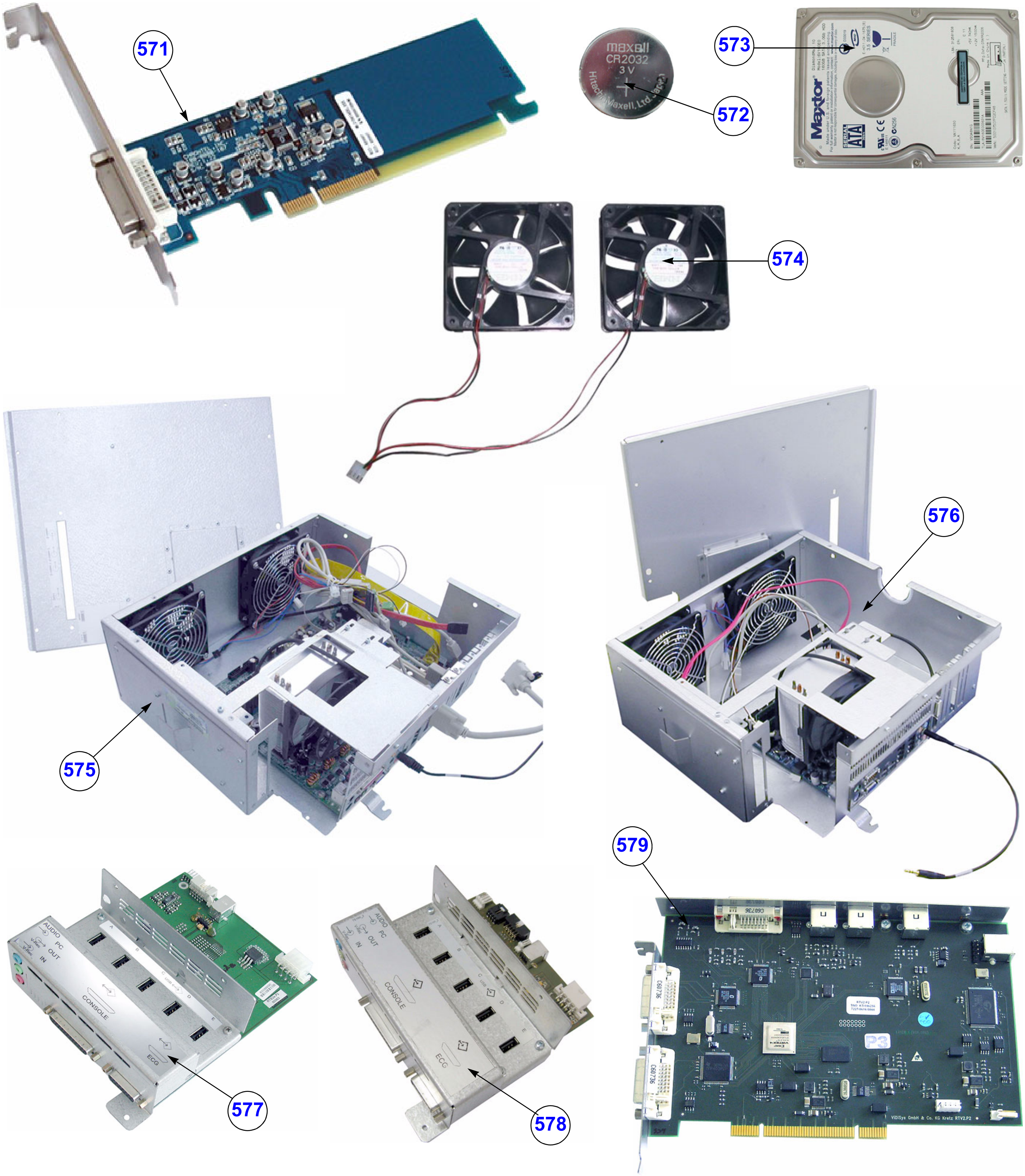


Figure 9-10 BackEnd (PC-Part) Components

Table 9-12 Back End (PC-Part) Components

Item	Part Name	Part Number	Description	Qty	FRU
571	ADD2-DVI card	KTZ208588	ADD2-DVI (Add-On) card for PC-Motherboard	1	1
572	Battery Lithium CR2032 (3V)	KTZ208791	Lithium Battery CR2032 (3V) for PC-Motherboard	1	1
573	Hard Disk Drive (HDD)	KTZ220529	Hard disk drive 160GB (Maxtor or Western digital) System/Boot DVD (see: Table 9-13) is **required**	1	1
574	Fan Set (2 fan) for PC - BackEnd	KTZ134698	Fan for PC-box (2 fan) - BackEnd	1	1
575	**BT06** Back End Processor (BEP) Kit incl. housing, ADD2-DVI card and cables	KTZ154769	Kit contains ATX Motherboard (TYAN), CPU cooler, ADD2-DVI card, 1Gb RAM, Serial Slot, Fan(s), housing + internal cables, DVI cable and Audio cable premounted (**BT06 only**)	1	1
576	**BT08** Back End Processor (BEP) Kit incl. housing, ADD2-DVI card and cables	KTZ154813	Kit contains ATX Motherboard, CPU cooler, ADD2-DVI card, 1Gb RAM, Serial Slot, Fan(s), housing + internal cables premounted (**BT08 only**)	1	1
577	RTB1-3b.P1-5 - Distribution Board Bottom	KTZ220501	Distribution Board Bottom replaced by RTB4 (KTZ221016)	1	1
578	RTB4.P6 - Distribution Board Bottom	KTZ221016	Distribution Board Bottom can replace RTB1-3 (KTZ220501)	1	1
579	RTV2a.P2 - Video Management Board	KTZ196208	Video Management Board	1	1

BT Version: Please observe that replacement parts might be different; dependent on BT-version.

Section 9-9
Options and Upgrades

Table 9-13 Software Options and Upgrades

Item	Part Name	Part Number	Description	Qty	FRU
601	System/Boot DVD (SW 6.2.4, **BT06**) **Note:** Refer to **SN79009**, which is the best source for the latest revision	KTZ280066	bootable DVD for System HDD recovery Contents: SP with newest MS patches, Linux rescue partition, System C: Image (Windows XP, Kontron + Tyan PC-Motherboard supplied) UISApp, Backup, EUM, Database Repair Tool, etc.	1	1
602	System/Boot DVD (SW 7.0.6, **BT08**) **Note:** Refer to **SN79009**, which is the best source for the latest revision	KTZ280128	bootable DVD for System HDD recovery Contents: SP with newest MS patches, Linux rescue partition, System C: Image (Windows XP, Kontron Dual-Core + DFI Dual-Core PC-Motherboard supplied) UISApp, Backup, EUM, Database Repair Tool, etc.	1	1
603	BIOS Upgrade CD Tv0.06 (**BT06**)	KTZ220891	CD containing BIOS-Flash software Tv0.06, (TYAN **only**)	-	N
604	Upgrade Kit: Voluson® E8 (BT06) to Voluson® E8 (BT08)	H48661KE	BT08 Upgrade kit (incl. new Hardware components, new BackEnd Processor kit, System DVD, System Manuals, etc.)	-	N
605	Upgrade Kit: Voluson® E8 (BT08) to Voluson® E8 Expert (BT08)	H48661LF	encrypted Software Option string (password) which is specific for each Voluson® E8 ultrasound system (**BT08 only**) + “Expert” label (User Interface)	-	N
606	Upgrade Kit: Voluson® E8 (BT06) to Voluson® E8 Expert (BT09)	H48671ZH	BT09 Upgrade kit (incl. new Hardware components, new BackEnd Processor kit, System DVD, System Manuals, etc.)	-	N
607	Upgrade Kit: Voluson® E8 (BT08) to Voluson® E8 (BT09)	H48671PJ	BT09 Upgrade kit (incl. new Hardware components, new BackEnd Processor kit, System DVD, System Manuals, etc.)	-	N
608	Upgrade Kit: Voluson® E8 Expert (BT08) to Voluson® E8 Expert (BT09)	H48671PK	BT09 Upgrade kit (incl. new Hardware components, new BackEnd Processor kit, System DVD, System Manuals, etc.)	-	N
609	Real Time 4D	H48651SL	encrypted Software Option string (password) which is specific for each Voluson® E8 ultrasound system	-	N
610	VOCAL II - Volume Calculation	H48651SM	encrypted Software Option string (password) which is specific for each Voluson® E8 ultrasound system	-	N
611	VCI - Volume Contrast Imaging	H48651SN	encrypted Software Option string (password) which is specific for each Voluson® E8 ultrasound system	-	N
612	Interface for DICOM 3 Standard	H48651SP	encrypted Software Option string (password) which is specific for each Voluson® E8 ultrasound system	-	N
613	STIC	H48651SR	encrypted Software Option string (password) which is specific for each Voluson® E8 ultrasound system	-	N
614	B-Flow	H48651SS	encrypted Software Option string (password) which is specific for each Voluson® E8 ultrasound system	-	N
615	Coded Contrast Imaging - Contrast Media	H48651ST	encrypted Software Option string (password) which is specific for each Voluson® E8 ultrasound system	-	N
616	TUI - Tomographic Ultrasound Imaging	H48651SW	encrypted Software Option string (password) which is specific for each Voluson® E8 ultrasound system	-	N
617	SonoVCAD Heart - Computer Assisted Heart Diagnosis Package	H48651SY	encrypted Software Option string (password) which is specific for each Voluson® E8 ultrasound system	-	N

Section 9-9 Options and Upgrades (cont'd)

Table 9-14 Software Options and Upgrades (cont´d)

Item	Part Name	Part Number	Description	Qty	FRU
618	STIC Oncology	H48661KF	encrypted Software Option string (password) which is specific for each Voluson® E8 ultrasound system (**BT08 only**)	-	N
619	SonoAVC - Sono Automated Volume Count	H48661KG	encrypted Software Option string (password) which is specific for each Voluson® E8 ultrasound system (**BT08 only**)	-	N
620	Fetal Expert Package	H48661KT	encrypted Application Package string (password) which is specific for each Voluson® E8 ultrasound system (**BT08 only**)	-	N
621	General Obstetrics Package	H48661KW	encrypted Application Package string (password) which is specific for each Voluson® E8 ultrasound system (**BT08 only**)	-	N
622	OB/Gyn Package	H48661KY	encrypted Application Package string (password) which is specific for each Voluson® E8 ultrasound system (**BT08 only**)	-	N
623	Gyn Package	H48661KZ	encrypted Application Package string (password) which is specific for each Voluson® E8 ultrasound system (**BT08 only**)	-	N
624	Breast Package	H48661L	encrypted Application Package string (password) which is specific for each Voluson® E8 ultrasound system (**BT08 only**)	-	N
625	ARM Package	H48661LE	encrypted Application Package string (password) which is specific for each Voluson® E8 ultrasound system (**BT08 only**)	-	N
626	4D View PC Software	H48651SZ	stand alone PC-Software which can be used to view and work on data produced with Kretztechnik´s Voluson® E8 system	-	N
627	CW-Doppler Upgrade Kit external	H48661KK	CW-Doppler Upgrade Kit incl. upgrade instructions for Voluson® E8 ultrasound system (**BT08 only**)	-	N
628	Key Cap Kit - Swedish	KTZ280015 H48651S	kit includes special native language keys	-	1
629	Key Cap Kit - Danish	KTZ280014 H48651SA	kit includes special native language keys	-	1
630	Key Cap Kit - Norwegian	KTZ280013 H48651SB	kit includes special native language keys	-	1
631	Key Cap Kit - Finnish	KTZ280012 H48651SC	kit includes special native language keys	-	1
632	Key Cap Kit - Spanish	KTZ280011 H48651SD	kit includes special native language keys	-	1
633	Key Cap Kit - French	KTZ280010 H48651SE	kit includes special native language keys	-	1
634	Key Cap Kit - German	KTZ280005 H48651SF	kit includes special native language keys	-	1
635	Key Cap Kit - Italian	KTZ280004 H48651SG	kit includes special native language keys	-	1

NOTICE A sales order has to be obtained for item !
Software Options (item 608 - 625): Once the order has been processed, the option string can be either entered by the customer or Applications support.

BT Version: The options "STIC Oncology" and "SonoAVC" are only applicable at systems with BT08 software.

BT Version: Application Packages are only available for systems with BT08 software.
For more details see: Table 5-2, "Software Options and Application Packages," on page 5-15.

Section 9-10
Miscellaneous Cables

Table 9-15 Miscellaneous Cables

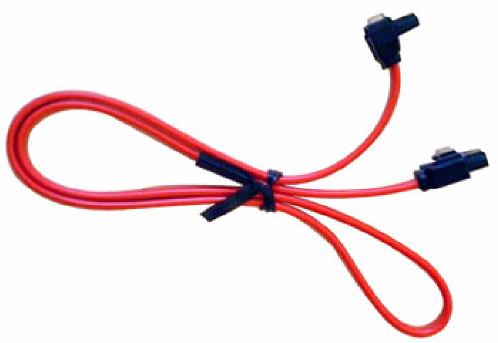
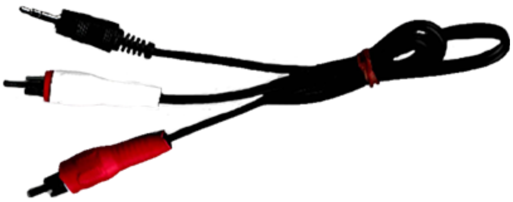
Item	Part Name	Part Number	Description	Qty	FRU
701	SATA Data Cable for HD-Drive	KTZ300244	SATA Data Cable for HD-Drive 	1	1
702	PCI-E Connection Cable (BEP - RFI)	KTZ220428	PCI-E Connection Cable from BackEnd to RFI board 	1	1
703	Cable Stereo Jack - Chinch	KTZ212074	Cable from PC-Sound-StereoJack to DVR Shelf 	2	1
704	KVX1 Network Cable	KTZ212016	Network Cable from external rear panel (GES) to the Voluson® E8 units (internal) rear panel 	1	1

Table 9-15 Miscellaneous Cables

Item	Part Name	Part Number	Description	Qty	FRU
705	Monitor Cable Set	KTZ196912	Monitor Cable Set (Power Cable and Video Cable) 	1	1
706	Power Cord Europe 230V	KTZ212317	Power Cord Europe 230V/240V used at Mains Input Connector C20 (16A type) 	1	1
707	Power Cord Japan (Hosp. grade)	KTZ212448	Power Cord Japan Hospital Grade used at Mains Input Connector C20 (16A type) 	1	1
708	Power Cord UK	KTZ212441	Power Cord United Kingdom 240V used at Mains Input Connector C20 (16A type) 	1	1

Table 9-15 Miscellaneous Cables

Item	Part Name	Part Number	Description	Qty	FRU
709	Power Cord USA (Hosp.grade)	KTZ212402	Power Cord USA Hospital Grade used at Mains Input Connector C20 (16A type) 	1	1
710	Power Cord - Europe 230V	KTZ220388	Power Cord Europe 230V/240V used at Mains Input Connector C14 (10A type) 	-	1
711	Power Cord - China	KTZ220391	Power Cord China used at Mains Input Connector C14 (10A type) 	-	1

Table 9-15 Miscellaneous Cables

Item	Part Name	Part Number	Description	Qty	FRU
712	Power Cord - Australia	KTZ220392	Power Cord Australia used at Mains Input Connector C14 (10A type) 	-	1
713	Power Cord - India	KTZ220387	Power Cord India used at Mains Input Connector C14 (10A type) 	-	1
714	Power Cord - United Kingdom	KTZ220476	Power Cord United Kingdom (UK) 240V used at Mains Input Connector C14 (10A type) 	-	1

Table 9-15 Miscellaneous Cables

Item	Part Name	Part Number	Description	Qty	FRU
715	Power Cord - South Africa	KTZ220477	Power Cord South Africa used at Mains Input Connector C14 (10A type) 	-	1
716	Power Cord - Argentina	KTZ220478	Power Cord Argentina used at Mains Input Connector C14 (10A type) 	-	1
717	Power Cord - Israel	KTZ220479	Power Cord Israel used at Mains Input Connector C14 (10A type) 	-	1

Table 9-15 Miscellaneous Cables

Item	Part Name	Part Number	Description	Qty	FRU
718	Power Cord - Switzerland	KTZ220480	Power Cord Switzerland used at Mains Input Connector C14 (10A type) 	-	1
719	Power Cord - Denmark	KTZ220481	Power Cord Denmark used at Mains Input Connector C14 (10A type) 	-	1
720	Cable DVI (Digital Visual Interface) from Add-On DVI Output to RTV	KTZ208574	Cable DVI (Digital Visual Interface) from ADD-On DVI Output to RTV) 	1	1

Table 9-15 Miscellaneous Cables

Item	Part Name	Part Number	Description	Qty	FRU
721	Console Cable	KTZ220876	Console Cable 	1	1
722	Monitor Power Connection Cable (Console rear panel -> RTH4)	KTZ300054	Monitor Power Connection cable from Console rear panel to Distribution bd USB-Hub (RTH4) 	1	1
723	USB -> RS-232 Adapter	KTZ212114	USB -> -RS-232 Adapter 	1	1
724	USB Cable	KTZ212125	USB Cable for Printers (1m) 	1	1

Table 9-15 Miscellaneous Cables

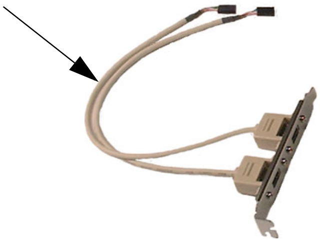
Item	Part Name	Part Number	Description	Qty	FRU
725	USB to PC-Motherboard	KTZ207029	**Set contains two parts:** **Not to be used** at Voluson® E8 systems  USB for PC-Slot, Connector on Backpanel. Cables are connected to PC-Board. Leads the USB-signals to the PC-Backpanel  **Note:** The cable above can also be used when replacing the USB connectors beside the DVD Drive in the Top Console. Therefore remove connectors from the metal bracket and mount them next to DVD Drive.	1	1
726	GES14 External I/O Connection Panel	KTZ196243	External Rear Panel incl. VGA, USB and Network cables to the Voluson® E8 (**BT06 only**) main unit (internal) 	1	1
727	GES15 External I/O Connection Panel	KTZ196332	External Rear Panel incl. VGA, USB, Network and S-Video cables to the Voluson® E8 main unit (internal), replaces GES14 (KTZ196243) 	1	1

Table 9-15 Miscellaneous Cables

Item	Part Name	Part Number	Description	Qty	FRU
728	Adapter S-Video -> RCA Jack (Cinch)	KTZ196334	Adapter S-Video -> RCA Jack (Cinch **only** to be used in combination with GES15 	1	1
729	RTP-ATX Adapter	KTZ220899	ATX Adapter between RTP (Secondary Power Supply) and PC-Motherboard 	1	1
730	VGA cable for Secondary Monitor	KTZ220527	VGA cable to connect Secondary Patient Monitor (15m) 	-	1

Section 9-11
Optional Peripherals and Accessories

Table 9-16 below outlines the replacement parts described in the sub-sections.

Table 9-16 Optional Peripherals and Accessories - Replacement Parts

Sub-section	Description	Page Number
9-11-1	Recording Tools	9-30
9-11-2	Printers	9-31
9-11-3	Drives & additional Devices	9-32
9-11-4	Optional Equipment	9-33

9-11-1 Recording Tools

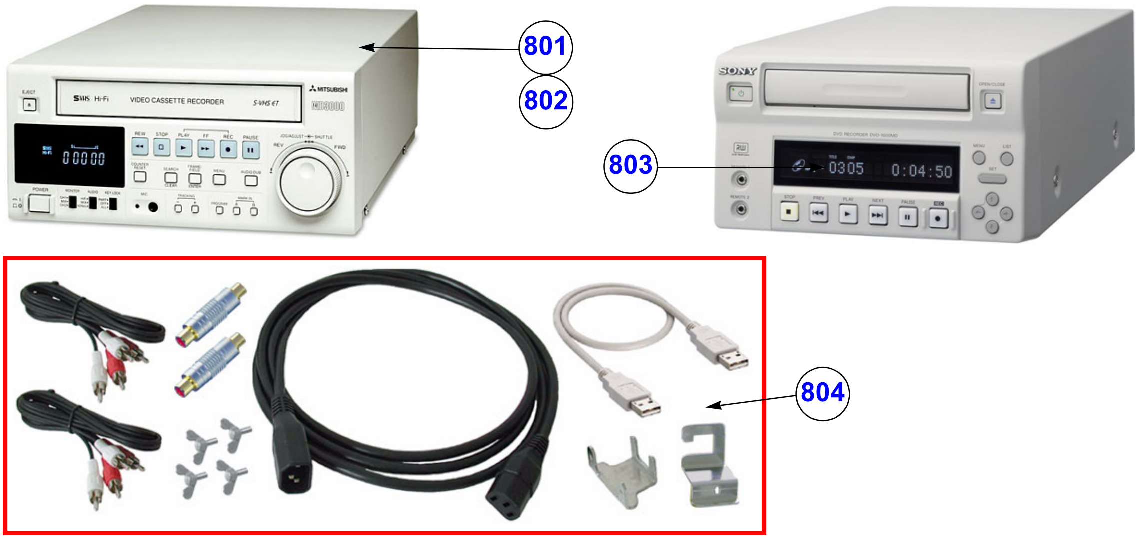


Figure 9-11 Optional Peripherals and Accessories - Recording Tools

Table 9-17 Optional Peripherals and Accessories - Recording Tools

Item	Part Name	Part Number	Description	Qty	FRU
801	S-VHS Medical Grade VCR - NTSC (Mitsubishi VCR HS-MD3000U)	KTZ211368 (H46801D)	Medical Grade VCR - NTSC Connection Kit (KTZ196311) is required	-	1
802	S-VHS Medical Grade VCR - PAL (Mitsubishi VCR HS-MD3000E)	KTZ211369 (H46801C)	Medical Grade VCR - PAL Connection Kit (KTZ196311) is required	-	1
803	DVD Recorder - PAL/NTSC (Sony DVO-1000MD)	KTZ154759 (H48651ND)	DVD Recorder (PAL/NTSC) Connection Kit (KTZ196311) is needed, if Color printer is already mounted in left shelf	-	1
804	Connection Kit (Video/DVD recorder to VE8)	KTZ196311	Connection Kit for Video/DVD recorder	-	1

NOTE: *The illustrations may not correspond to the actual product!*

9-11-2 Printers

Figure 9-12 Optional Peripherals and Accessories - Printers

Table 9-18 Optional Peripherals and Accessories - Printers

Item	Part Name	Part Number	Description	Qty	FRU
811	Digital B/W Video Printer (Sony UP-D897)	KTZ220507 (H48651ML)	Digital B/W Video Printer, USB-Port	-	1
812	Digital Color Printer (Sony UP-D23MD)	KTZ211373 (H46831B)	Digital Color Printer, USB-Port	-	1
813	Line Printer Bluetooth (HP 5940)	KTZ220510 (H48651WE)	Line Printer Bluetooth (USB-Port) **without** cartridge (Bluetooth Connection Set KTZ196002 is required) can be replaced by Canon printer KTZ300182	-	1
814	Bluetooth Connection Set	KTZ196002 (H46631M)	Bluetooth Connection Set for HP Line Printer (KTZ220510)	-	1
815	Line Printer Bluetooth (Canon Pixma MP600 or MP610)	KTZ300182 (H48661MT)	Line Printer Bluetooth incl. Ink, Bluetooth Adapters + power cable US and EU (replaces HP printer KTZ220510)	-	1
816	Line Printer Destination Set	KTZ280057 (H48661MW)	Line printer power cable set for US, EU and ROW (rest of world)	-	1

NOTE: The illustrations may not correspond to the actual product!

9-11-3 Drives & additional Devices

Figure 9-13 Optional Peripherals and Accessories - Drives & additional Devices

Table 9-19 Optional Peripherals and Accessories - Drives & additional Devices

Item	Part Name	Part Number	Description	Qty	FRU
821	LAN Optical Isolation Box	EP200132 (H45021EC)	LAN Patient Isolation Box (replaces PRJ1 network isolation)	-	1
822	USB Stick 512MB	2411544 (H45021G)	USB Flash Memory Stick (512 MB)	-	1
823	USB-RS232 Connection kit PRY	KTZ195858 (H46681S)	Converter from USB to RS-232 Serial Port (Connection Module - Report data)	-	1
824	USB external Hard Disk Drive	KTZ220680 (H48661DF)	USB “Handydrive” external Hard disk drive 80GB	-	1
825	Wireless Network Interface - EU & MEA	KTZ196269 (H48661KN)	Wireless Network Interface (“D-Link” WLAN Adapter) for Europe, Middle East & Africa, **BT08 only** **obsolete:** replaced by “Netgear” WLAN Adapter	-	1
826	Wireless Network Interface	KTZ196269 (H48671DT)	Wireless Network Interface (“Netgear” WLAN Adapter), **BT08 only**, (**SW 7.0.2** or higher is required), replaces “D-Link” WLAN Adapter	-	1

NOTE: The illustrations may not correspond to the actual product!

9-11-4 Optional Equipment

Figure 9-14 Optional Peripherals and Accessories - Optional Equipment

Table 9-20 Optional Peripherals and Accessories - Optional Equipment

Item	Part Name	Part Number	Description	Qty	FRU
831	19” LCD Secondary Monitor	H48671EM	19” LCD Secondary “Patient” Monitor incl. Wall Mount kit, Isolation Transformer, cables, etc.	-	-
832	19” LCD Secondary Monitor	KTZ220525	19” LCD Secondary “Patient” Monitor **without** Wall Mount kit and Transformer	-	2
833	Isolation Transformer kit	H48671WN	Isolation Transformer kit for Secondary Monitor incl. power cord set for US, EU and ROW (rest of world), monitor power cable, fuses, documentation, etc.	-	-
834	Isolation Transformer	KTZ220714	Isolation Transformer **without** cables, etc.	-	1
835	Fuses for Isolation Transformer	KTZ196333	Fuses for Isolation Transformer (2AT, 4AT; 10 pcs. each = 20)	-	1
836	Wall Mount kit for 19” LCD Secondary Monitor	KTZ220526	Wall Mount kit for 19” LCD Secondary Monitor	-	2
837	VGA Image Resizer	KTZ280074 (H48671KJ)	VGA Image Resizer (resizer box, power supply, cables, documentation, etc.), **Note:** Required whenever the used Secondary Monitor has a different screen resolution than the VE8 system.	-	1
838	RIC-Holder	KTZ225469	Probe holder used for Real-time 4D endocavity probes (RIC) during disinfection process	-	1
839	ECG-preamplifier (MAN 6)	KTZ154644 (H46681H)	consists of ECG-preamplifier and patient connection cable	-	1
840	Foot switch (GP26)	KTZ196270 (H48651T)	Scan/Freeze Foot switch	-	1
	DVD+RW Disk blank	KTZ196204 (H48641D)	DVD+RW Disk (re-writable)	-	1

NOTE: The illustrations may not correspond to the actual product!

Section 9-12
System Manuals

Table 9-21 System Manuals - Voluson® E8 / Voluson® E8 Expert

Part Name	Part # BT06	Kretz # BT06	Part # BT08	Kretz # BT08
Service Manual, Voluson® E8	KTI106056	KTI106056	KTI106056	KTI106056
System User Manuals				
Basic User Manual, Voluson® E8, English	H48651RC	KTI106035	H48661EG	KTI106186
Basic User Manual, Voluson® E8, German	H48651RD	KTI106072	H48661EH	KTI106188
Basic User Manual, Voluson® E8, Spanish	H48651RE	KTI106073	H48661EJ	KTI106189
Basic User Manual, Voluson® E8, Portuguese	H48651RF	KT106074	H48661EK	KTI106190
Basic User Manual, Voluson® E8, Italian	H48651RG	KTI106075	H48661EL	KTI106191
Basic User Manual, Voluson® E8, French	H48651RH	KTI106076	H48661EM	KTI106192
Basic User Manual, Voluson® E8, Mandarin Chinese	H48651RJ	KTI106077	H48661EN	KTI106193
Basic User Manual, Voluson® E8, Japanese	H48651RK	KT106078	H48661EP	KTI106194
Basic User Manual, Voluson® E8, Mandarin TR Chinese	H48651RL	KTI106079	H48661ES	KTI106195
Basic User Manual, Voluson® E8, Danish	H48651RM	KTI106080	H48661ER	KTI106196
Basic User Manual, Voluson® E8, Dutch	H48651RN	KT106081	H48661ET	KTI106197
Basic User Manual, Voluson® E8, Finnish	H48651RP	KTI106082	H48661EW	KTI106198
Basic User Manual, Voluson® E8, Greek	H48651RR	KTI106083	H48661EY	KTI106199
Basic User Manual, Voluson® E8, Norwegian	H48651RS	KTI106084	H48661EZ	KTI106200
Basic User Manual, Voluson® E8, Polish	H48651RT	KTI106085	H48661F	KTI106201
Basic User Manual, Voluson® E8, Russian	H48651RW	KTI106086	H48661FA	KTI106202
Basic User Manual, Voluson® E8, Swedish	H48651RY	KTI106087	H48661FB	KTI106203
Basic User Manual, Voluson® E8, Turkish	H48651RZ	KTI106088	H48661FC	KTI106204
Basic User Manual, Voluson® E8, Czech	H48651TT	KTI106104	H48661FD	KTI106205
Basic User Manual, Voluson® E8, Hungarian	H48651TW	KTI106105	H48661FE	KTI106206
Basic User Manual, Voluson® E8, Latvian	H48651TY	KTI106106	H48661FF	KTI106207
Basic User Manual, Voluson® E8, Lithuanian	H48651TZ	KTI106107	H48661FG	KTI106208
Basic User Manual, Voluson® E8, Estonian	H48651W	KTI106065	H48661FH	KTI106209
Basic User Manual, Voluson® E8, Slovakian	H48651WA	KTI106066	H48661FJ	KTI106210
Basic User Manual, Voluson® E8, Rumanian	H48651WB	KTI106067	H48661FK	KTI106211
Basic User Manual, Voluson® E8, Korean	H48651WC	KTI106068	H48661FL	KTI106212
Basic User Manual, Voluson® E8, Serbian	H48671LR	KTD101026	H48661NF	KTD101018
Basic User Manual, Voluson® E8, Croatian	H48671LS	KTD101027	H48661LH	KTD100540
Basic User Manual, Voluson® E8, Bulgarian	---	---	H48661NG	KTD100541
Basic User Manual, Voluson® E8, Portoguese (Europe)	---	---	H48671LT	KTD101019
Advanced Reference Manual, English	H48651TC	KTI106022	H48661KL	KTD100278

Section 9-13
Probes

Table 9-22 below outlines the replacement parts described in the sub-sections.

Table 9-22 Probes - Replacement Parts

Sub-section	Description	Page Number
9-13-1	2D-Probes - Curved Array Transducers	9-37
9-13-2	2D-Probes - Linear Array Transducers	9-38
9-13-3	2D-Probes - Phased Array Transducers	9-39
9-13-4	Real-Time 4D Volume Probes	9-40
9-13-5	CW-Doppler - Pencil Probes	9-42

9-13-1 2D-Probes - Curved Array Transducers

Figure 9-15 2D curved array Transducers

Table 9-23 2D curved array Transducers

Item	Part Name	Part Number	Description	Qty	FRU
900	4C-D	KTZ157036 (H4001BC)	broadband curved array transducer, 1.5 - 4.6 MHz, 128 Elements Applications: Abdominal, Obstetrics, Gynecology	-	1
901	M6C-D	KTZ157049 (H40432LM)	1,5D Matrix curved array transducer, 2.14 - 6.1 MHz, 192 Elements / 5 rows Applications: Abdominal, Obstetrics, Gynecology, Pediatrics	-	1
902	AB2-7-D	KTZ157022 (H48651MW)	broadband curved array transducer, 2.0 - 8.0 MHz, 192 Elements Applications: Abdominal, Obstetrics, Gynecology, Urology, Pediatrics	-	1
903	IC5-9-D	KTZ280047 (H40442LK)	endocavity broadband curved array transducer, 3.7 - 9.3 MHz, 192 Elements, field of view: max. 175° Applications: Obstetrics, Gynecology, Urology	-	1

BT Version: The probe "IC5-9-D" is only applicable at systems with BT08 software (SW 7.x.x).

9-13-2 2D-Probes - Linear Array Transducers

Figure 9-16 2D linear array Transducers

Table 9-24 2D linear array Transducers

Item	Part Name	Part Number	Description	Qty	FRU
910	SP10-16-D	KTZ157047 (H48651MT)	broadband linear array transducer, 4.5 - 16.5 MHz, 192 Elements, electronically steerable Applications: Small Parts, Peripheral Vascular, Pediatrics, Orthopedics	-	1
911	11L-D	KTZ157048 (H40432LN)	broadband linear array transducer, 5.9 - 17.3 MHz, 192 Elements, electronically steerable Applications: Small Parts, Peripheral Vascular, Pediatrics, Orthopedics	-	1
912	9L-D	KTZ280048 (H40442LM)	broadband linear array transducer, 3.1 - 7.9 MHz, 192 Elements, electronically steerable Applications: Small Parts, Peripheral Vascular, Pediatrics, Orthopedics	-	1

BT Version: The probe “9L-D” is only applicable at systems with BT08 software (SW 7.x.x).

9-13-3 2D-Probes - Phased Array Transducers

Figure 9-17 2D phased array Transducers

Table 9-25 2D phased array Transducers

Item	Part Name	Part Number	Description	Qty	FRU
920	PA6-8-D	KTZ157042 (H48651MZ)	broadband phased array transducer, 3.9- 9.4 MHz, 128 Elements Applications: Abdominal, Cardiology, Pediatrics/Neonatology	-	1
921	3S-D	KTZ280049 (H48661LG)	broadband phased array transducer, 1.37 - 3.25 MHz, 64 Elements Applications: Cardiology, Pediatrics, Neurology	-	1

BT Version: The probes “PA6-8-D” and “3S-D” are only applicable at systems with BT08 software (SW 7.x.x).

9-13-4 Real-Time 4D Volume Probes

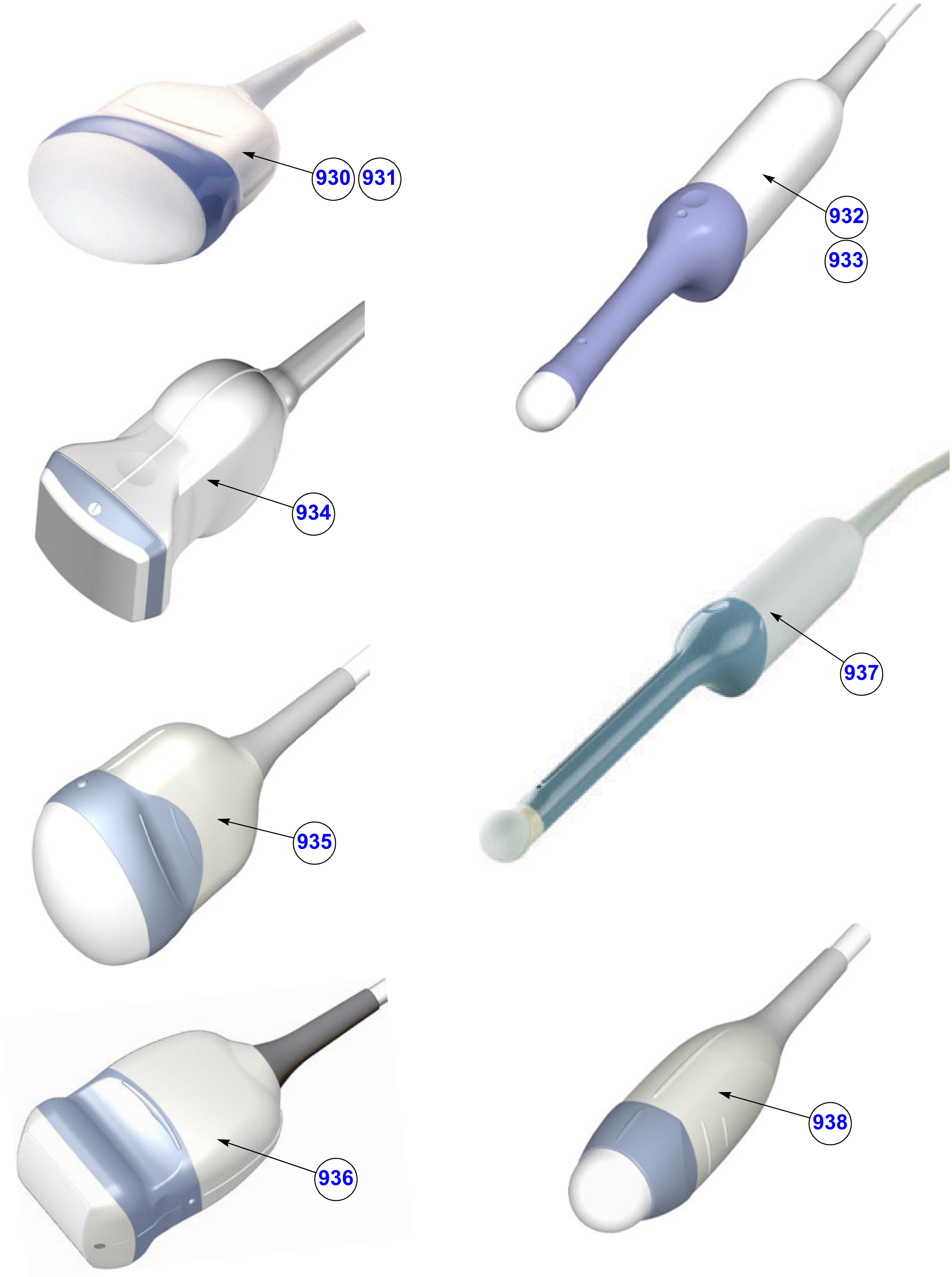


Figure 9-18 Real-Time 4D Volume Probes

Table 9-26 Real-Time 4D Volume Probes

Item	Part Name	Part Number	Description	Qty	FRU
930	RAB2-5-D	KTZ157037 (H48651MN)	Real-time 4D broadband electronic curved-array transducer 2 - 5 MHz, 192 Elements Applications: Abdominal, Obstetrics, Gynecology, Interventional Radiology	-	1
931	RAB4-8-D	KTZ157038 (H48651MP)	Real-time 4D broadband electronic curved-array transducer 4 - 8.5 MHz, 192 Elements Applications: Abdominal, OB, Gyn, Pediatrics, Urology, Interventional Radiology	-	1
932	RIC5-9-D	KTZ157043 (H48651MS)	Real-time 4D endocavity broadband electronic curved array transducer 3.7 - 9.3 MHz, 192 Elements, field of view: max. 175° Applications: Gynecology/Fertility, Obstetrics, Urology	-	1
933	RIC6-12-D	KTZ157045 (H48651NA)	Real-time 4D endocavity broadband electronic curved array transducer 4.5 - 11.9 MHz, 256 Elements, field of view: max. 190° Applications: Gynecology/Fertility, Obstetrics, Urology **Note:** This probe is only applicable at Voluson® E8 **Expert** systems (BT08 only).	-	1
934	RSP6-16-D	KTZ157046 (H48651MR)	Real-time 4D broadband electronic linear array transducer 5.6 - 18.4 MHz, 192 Elements Applications: Small Parts, Periph.Vascular, Pediatrics, Urology, Orthopedics	-	1
935	RAM3-8-D	KTZ157039 (H48651NB)	Abdominal Matrix Array (AMA) Real-time 4D broadband electronic transducer 2.14 - 6.55 MHz, 192 Elements / 5 rows (= 960) Applications: Abdominal, OB, Gyn, Pediatrics, Urology, Interventional Radiology **Note:** This probe is only applicable at Voluson® E8 **Expert** systems (BT08 only).	-	1
936	RSM5-14-D	KTZ157044 (H48651NC)	Linear Matrix Array (LMA) Real-time 4D broadband electronic transducer 4.7 - 13 MHz, 192 Elements / 5 rows (= 960) Applications: Small Parts, Periph.Vascular, Pediatrics, Urology, Orthopedics **Note:** This probe is only applicable at Voluson® E8 **Expert** systems (BT08 only).	-	1
937	RRE6-10-D	KTZ156992 (H48651N)	Real-time 4D Multi-Plane broadband curved array transrectal transducer 3.3 - 10 MHz, 192 Elements, field of view: max. 146° Applications: Gynecology, Urology, Rectal wall	-	1
938	RNA5-9-D	KTZ156994 (H48651MY)	Real-time 4D neonatal broadband electronic curved array transducer 3.3 - 9.1 MHz, 192 Elements, field of view: max. 145° Applications: Abdominal, Small Parts, Obstetrics, Cardiology, Pediatrics	-	1

BT Version: The probes “RSM5-14-D”, “RRE6-10-D” and “RNA5-9-D” are only applicable at systems with BT08 software (SW 7.x.x).

BT Version: The probes “RIC6-12D”, “RSM5-14-D” and “RAM3-8-D” are only applicable at Voluson® E8 **Expert** systems (BT08 only); i.e. “Expert” option is purchased an therefore **P**ermanently activated.

9-13-5 CW-Doppler - Pencil Probes

Figure 9-19 CW-Doppler - Pencil Probes

Table 9-27 CW-Doppler - Pencil Probes

Item	Part Name	Part Number	Description	Qty	FRU
940	P2D	KTZ280051 (H4830JE)	Continuous Wave (CW) Doppler pencil probe with a center frequency of 2.1 MHz (no B-image) Applications: Cardiology (suprasternal), Peripheral Vascular, Neurology	-	1
941	P6D	KTZ280050 (H4830JG)	Continuous Wave (CW) Doppler pencil probe with a center frequency of 5.56 MHz (no B-image) Applications: Cardiology, Peripheral Vascular, Pediatrics	-	1

BT Version: The probes “P2D” and “P6D” are only applicable at systems with BT08 software (SW 7.x.x).

Section 9-14
Biopsy Needle Guides

NOTICE A sales order has to be obtained for most of the Biopsy Needle Guides.

Figure 9-20 Biopsy Needle Guides

Table 9-28 Biopsy Needle Guides

Item	Part Name	Part Number	Description	Qty	FRU
950	***** (disposable)	E8385MJ	disposable Biopsy needle guide for probe **IC5-9-D** needle diameter: < 1.65 mm	-	N
951	***** (reusable)	KTZ196274 H40412LN	reusable Biopsy needle guide for probe **IC5-9-D** needle diameter: < 1.65 mm	-	N
952	PEC63	KTZ220003 (H46721R)	reusable Biopsy needle guide for probe **RIC5-9-D / RIC6-12-D** needle diameter: < 1.8 mm	-	N
953	PEC64	KTZ220004 (H46721B)	reusable Biopsy needle guide for probe **SP10-16-D** needle diameter: < 1 mm, 1.4 mm, 2.2 mm	-	N
954	PEC 82	H48671MD	reusable Biopsy needle guide for probe **SP10-16-D** needle diameter: < 1 mm, 1.4 mm, 2.2 mm	-	N
955	PEC69	H46721S	reusable Biopsy needle guide for probe **RRE6-10-D** needle diameter: < 1.4 mm	-	N
956	PEC71	H46721D	reusable Biopsy needle guide for probe **AB2-7-D** needle diameter: < 1 mm, 1.4 mm, 2.2 mm	-	N
957	PEC 83	H48671ME	reusable Biopsy needle guide for probe **AB2-7-D** needle diameter: < 1 mm, 1.4 mm, 2.2 mm	-	N

Section 9-14 Biopsy Needle Guides (cont'd)

Figure 9-21 Biopsy Needle Guides

Table 9-29 Biopsy Needle Guides

Item	Part Name	Part Number	Description	Qty	FRU
960	PEC74	KTZ220078 (H48621Y)	reusable Biopsy needle guide for probe **RAB2-5-D / RAB4-8-D** needle diameter: < 1 mm, 1.4 mm, 2.2 mm	-	N
961	RAB Single-angle bracket	H46701AE	Non Sterile Single Angle Bracket needle guide for probe **RAB2-5-D/RAB4-8-D** needle diameter: > 0.6 mm - < 2.1 mm	-	N
962	PEC75	KTZ196275 (H46721W)	reusable Biopsy needle guide for probe **RSP6-16-D** needle diameter: < 1 mm, 1.4 mm, 2.2 mm	-	N
963	RSP Single-angle bracket	H46701AD	Non Sterile Single Angle Bracket needle guide for probe **RSP6-16-D** needle diameter: > 0.6 mm - < 2.1 mm	-	N
964	PEC76	H48651DG	reusable Biopsy needle guide for probe **RNA5-9-D** needle diameter: < 1 mm, 1.4 mm, 2.2 mm	-	N
965	RNA Single-angle bracket	H46701AF	Non Sterile Single Angle Bracket needle guide for probe **RNA5-9-D** needle diameter: > 0.6 mm - < 2.1 mm	-	N
967	PEC 80	(H48651PP)	reusable Biopsy needle guide for probe **RSM5-14-D** needle diameter: < 1 mm, 1.4 mm, 2.2 mm	-	N
968	PEC 81	(H48651PN)	reusable Biopsy needle guide for probe **RAM3-8-D** needle diameter: < 1 mm, 1.4 mm, 2.2 mm	-	N

Section 9-14 Biopsy Needle Guides (cont'd)

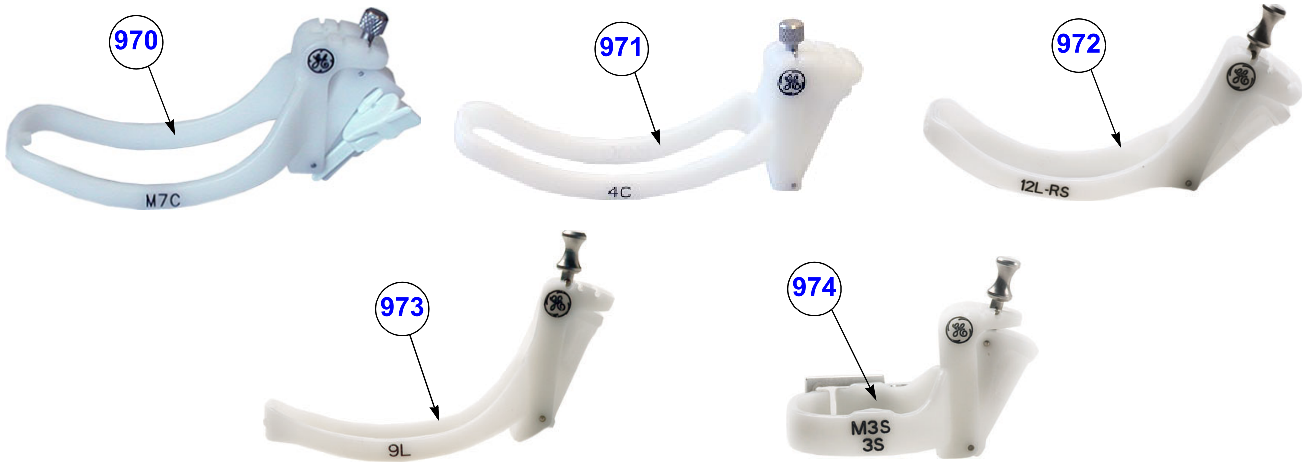


Figure 9-22 Biopsy Needle Guides

Table 9-30 Biopsy Needle Guides

Item	Part Name	Part Number	Description	Qty	FRU
970	M7C Multi-angle bracket	E8385RF	Non Sterile Multi Angle Bracket needle guide starter kit for probe **M6C-D** needle diameter: > 0.6 mm - < 2.1 mm	-	N
971	4C Multi-angle bracket	E8385NA	Non Sterile Multi Angle Bracket needle guide starter kit for probe **4C-D** needle diameter: > 0.6 mm - < 2.1 mm	-	N
972	12L-RS Multi-angle bracket	H40432LC	Non Sterile Multi Angle Bracket needle guide for probe **11L-D** needle diameter: > 0.6 mm - < 2.1 mm	-	N
973	9L Multi-angle bracket	H4906BK	Non Sterile Multi Angle Bracket needle guide for probe **9L-D** needle diameter: > 0.6 mm - < 2.1 mm	-	N
974	3S Multi-angle bracket	H48661LG	Non Sterile Multi Angle Bracket needle guide for probe **3S-D** needle diameter: > 0.6 mm - < 2.1 mm	-	N

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Chapter 10
Care & Maintenance

Section 10-1
Overview

10-1-1 Periodic Maintenance Inspections

It has been determined by engineering that your Voluson® E8 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® E8 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® E8 should be serviced and outlines items requiring special attention.

NOTE: *It is the customer's responsibility to ensure the Voluson® E8 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® E8 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® E8 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, Touch Panel and Probe holder	Clean LCD Monitor surface, Touch Panel 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 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
SVHS VCR Cassette	E7010GG E7010GF	60 minute 120 minute
SVHS VCR Head Cleaner		see VCR user manual for requirements
QIQ Phantom	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 and Touch Panel.
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 4-37).
7	Image Archive	Backup the Image Archive on DVD, USB-Stick, etc. (see: Section 4-5-6-1 "Save Image Archive" on page 4-42).

10-5-2 Functional Checks

The functional checks take about 60 minutes to perform.
Refer to the Voluson® E8 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 and CW if available). 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	Touch Panel	Verify basic Touch Panel display functions.
12	Measurements	Scan a gray scale phantom 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 3-9, "Approved Peripherals," on page 3-71 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	VCR	Verify record/playback capabilities of the VCR. Clean heads and covers if necessary.
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)
9	ECG	Verify basic operation with customer.

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® E8 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 + Touch Panel	Clean LCD Monitor surface and Touch Panel with a fluid detergent in warm water on a soft, damp cloth. **Caution:** DO NOT spray any liquid directly onto the Voluson® E8 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

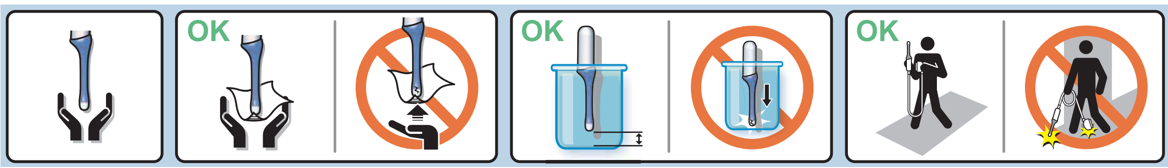
Table 10-10 Probe Related Checks

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® E8 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® E8 for details on cleaning.

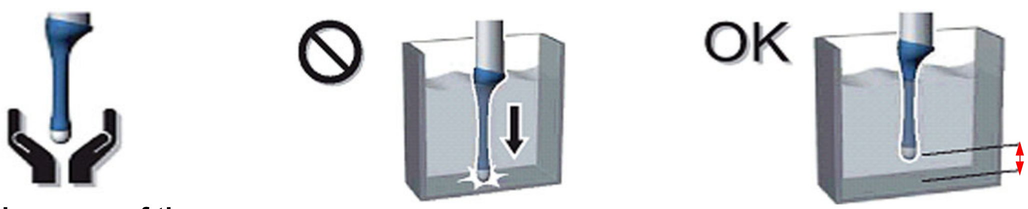
CAUTION **Failure to follow the prescribed cleaning or disinfection procedures will void the probe's warranty. DO NOT soak or wipe the lens with any product not listed in the Voluson® E8 Basic User Manual and/or care card. Doing so could result in irreparable damage to the probe and/or Voluson® E8 system.**

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!

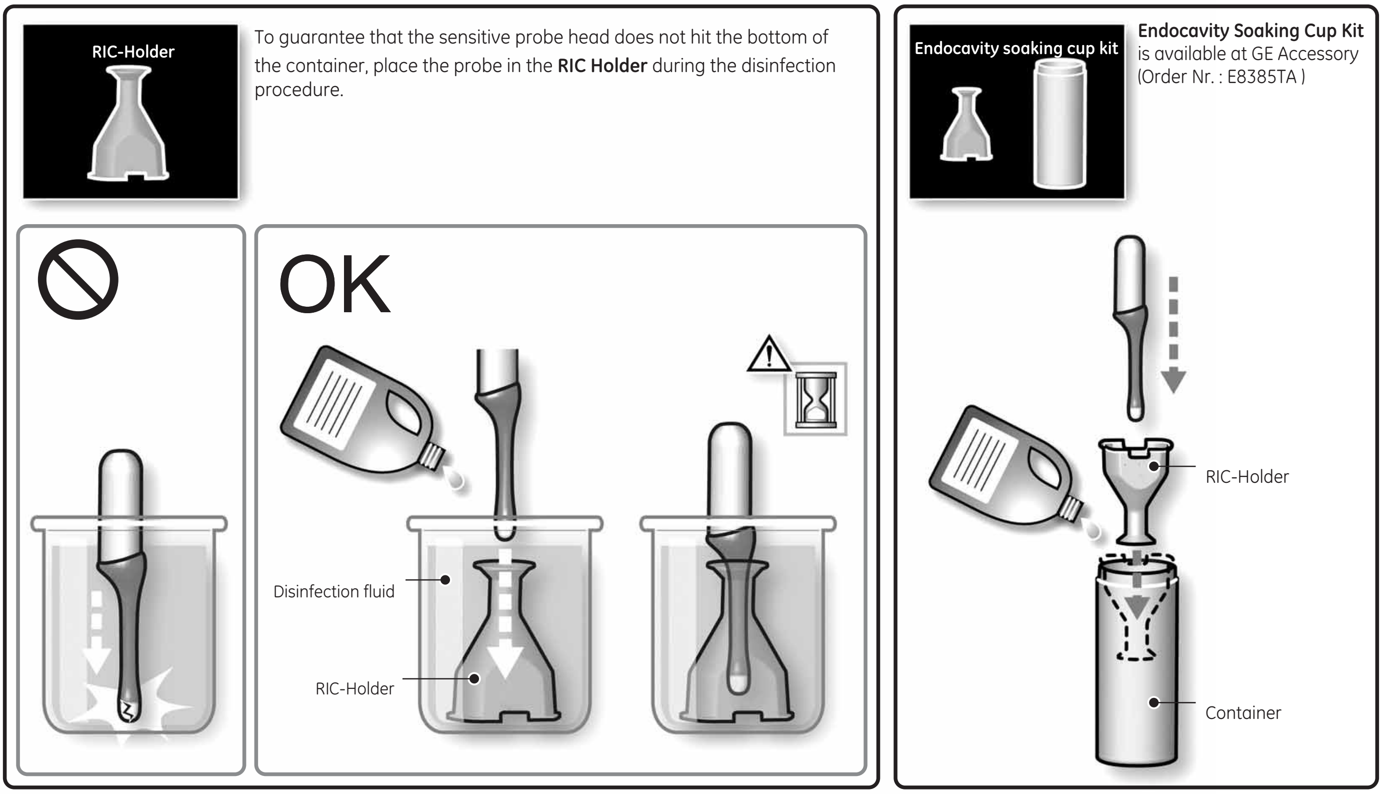
When disinfecting a probe, ensure that there is sufficient space between the probe and the container bottom!

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

Refer to the User Manual of the Phantom for information on using a phantom and quality assurance tests. For measurement accuracy of the system review chapter 13.5 of the Basic User Manual of Voluson® E8. To get comparable results, use Multi-purpose phantom, Model 539-05 from ATS Laboratories Inc.

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 NFPA 99 (For USA) and IEC 60601-1 Medical Equipment Safety Standards. They are intended for the electrical safety evaluation of cord-connected, electrically operated, patient care equipment. If additional information is needed, refer to the NFPA 99 (For USA) and IEC 60601-1 documents.

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 IEC-EN 60601-1. 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® E8 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.

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® E8

The following limits are summarized for NFPA 99 (For USA), IEC 60601-1 Medical Equipment Safety Standards, and IEC 62353 Medical Electrical Equipment - Recurrent test and test after repair of medical electrical equipment.
Measurement limits per IEC 60601-1 Medical Equipment Safety Standards, Table IV.

Table 10-11 Chassis Leakage Current Limits -Accessible Metal Surfaces

Country	Normal Condition	Open Ground	Reverse Polarity	Open Neutral
USA	0.1 mA	0.3 mA*	0.3 mA	0.3 mA
Other	0.1 mA	0.5 mA	0.5 mA	0.5 mA

Table 10-12 Type BF Patient Leakage Limits - Non-Conductive (Floating) Surface and Cavity Probes

all Countries	Normal Condition	Open Ground	Reverse Polarity	Open Neutral
USA	0.1 mA	0.5 mA	0.5 mA	0.5 mA
Other	0.1 mA	0.5 mA	0.5 mA	0.5 mA

Table 10-13 Type CF Patient Leakage Limits - Surgical Probes and ECG Connections

all Countries	Normal Condition	Open Ground	Reverse Polarity	Open Neutral
USA	0.01 mA	0.05 mA	0.05 mA	0.05 mA
Other	0.01 mA	0.05 mA	0.05 mA	0.05 mA

Table 10-14 ISO (on Dale 600) and Mains Applied (on Dale 601) Limits**

Probe Type	Measurement
BF	0.5 mA
CF	0.05 mA

NOTE: ** Measurement limits per IEC 60601-1 Medical Equipment Safety Standards, Table 19.5DV.1*

*** ISO (on Dale 600) and Mains Applied (on Dale 601) refer to the sink leakage test where mains (supply) voltage is applied to the part to determine the amount of current that will pass (or sink) to ground if a patient contacted mains voltage.*

The following tests are performed at the factory and should be performed at site.

- Grounding Continuity
- Chassis Leakage Current
- Probe Leakage Current
- ECG Leakage Current

All measurements are 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.

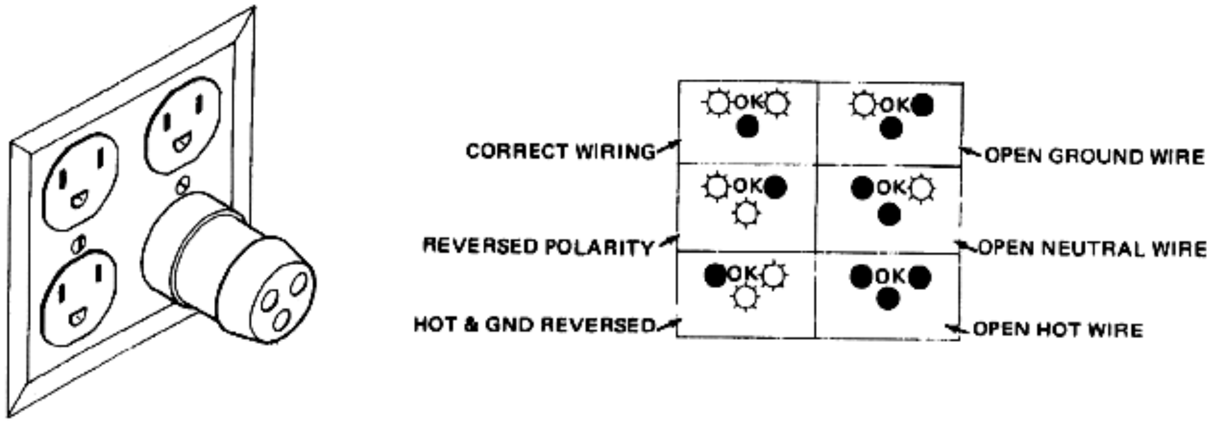


Figure 10-1 Typical Outlet Tester

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 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® E8 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 metal part of the Voluson® E8 unit.
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 Chassis Leakage Current Test

10-7-5-1 Definition

This test measures the current that would flow in a grounded person who touched accessible metal parts of the bedside station if the ground wire should break. The test verifies the isolation of the power line from the chassis.

The meter is connected from accessible metal parts of the case to ground. Measurements should be made with the unit On and Off, with the power line polarity Normal and Reversed. 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 chassis. The testing meter is connected from accessible metal parts of the case to ground. Measurements should be made with the unit ON and OFF, with the power line polarity Normal and Reversed. Record the highest reading of current.

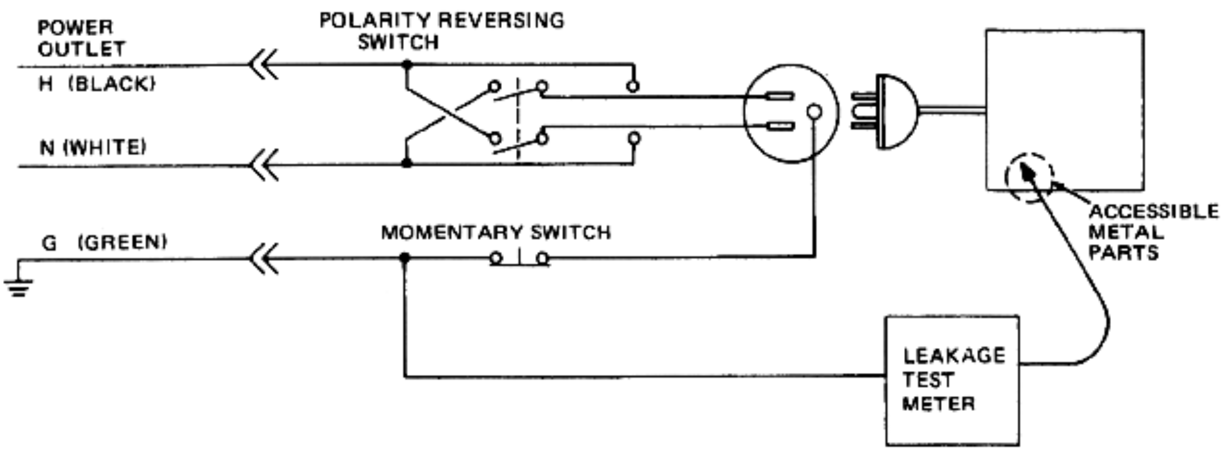


Figure 10-3 Set Up for Chassis Source Leakage Current, IEC 60601-1 Clause 19 - Continuos Leakage Currents and Patient, Auxiliary Currents

When using the Microguard 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 Chassis Source 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 10-15 Typical Data Sheet for Chassis Source Leakage Current

Unit Power	Tester Polarity Switch	Tester Neutral or Ground Switch	Test 1 Probe Connector	Test 2 Wheel	Test 3 CRT	Optional Test 4	Optional Test 5
Enter Name of tested peripheral here:							
ON	NORM	OPEN					
ON	NORM	CLOSED					
ON	REV	OPEN					
ON	REV	CLOSED					
OFF	NORM	OPEN					
OFF	NORM	CLOSED					
OFF	REV	OPEN					
OFF	REV	CLOSED					

10-7-6 Isolated Patient Lead (Source) Leakage–Lead to Ground

10-7-6-1 Definition

This test measures the current which would flow to ground from any of the isolated ECG leads. The meter simulates a patient who is connected to the monitoring equipment and is grounded by touching some other grounded surface. Measurements should be made with the ground open and closed, with power line polarity normal and reversed, and with the ultrasound console Off and On. For each combination the operating controls, such as the lead switch, should be operated to find the worst case condition.

CAUTION **Equipment damage possibility. Never switch the Polarity when the unit is powered ON. Be sure to turn the unit power OFF before switching the polarity using the POLARITY switch. Otherwise, the unit may be damaged.**

10-7-6-2 Generic Procedure

Measurements should be made with the ground open and closed, with power line polarity normal and reversed, and with the unit Off and On. For each combination, the operating controls such as the lead switch should be operated to find the worst case condition.

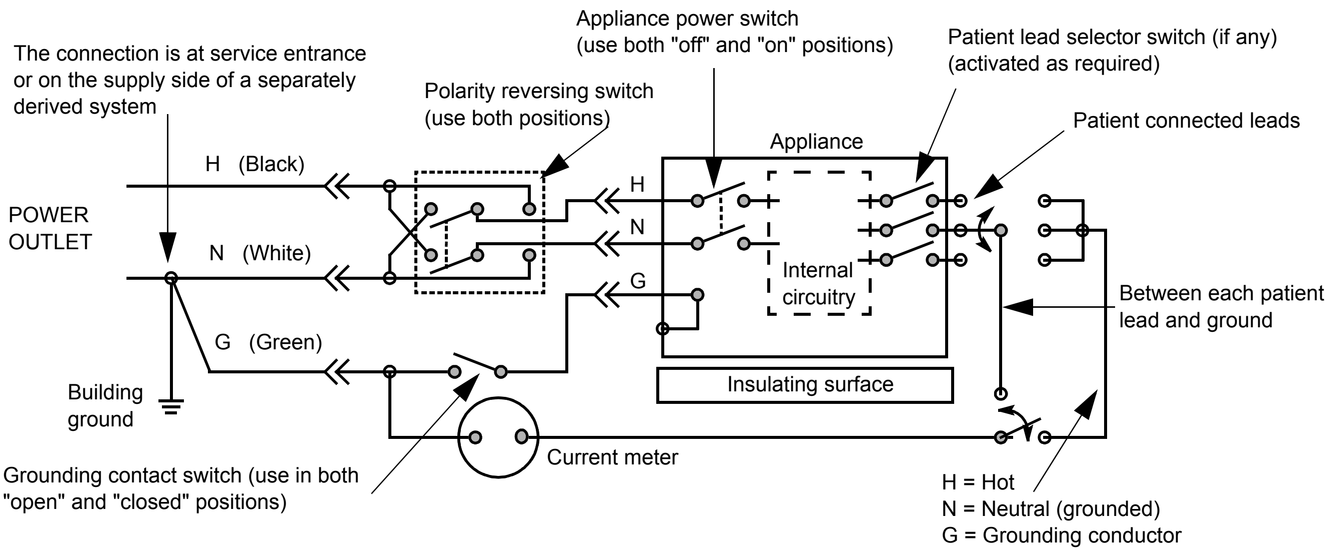


Figure 10-4 Test Circuit for Measuring Non-Isolated Patient Leads

Table 10-16 Testing Power Conditions

ECG Power	Meter's Polarity Switch	Meter's Neutral Switch
ON	NORM	CLOSED
ON	NORM	OPEN
ON	REVERSE	CLOSED
ON	REVERSE	OPEN
OFF	NORM	CLOSED
OFF	NORM	OPEN
OFF	REVERSE	CLOSED
OFF	REVERSE	OPEN

10-7-7 Isolated Patient Lead (Source) Leakage–Lead to Lead

Reference the procedure in the IEC 60601-1. When using the Dale 600, switch the meter's function selector to the LEAD-LEAD position. Select and test each of the five ECG lead positions (except ALL) on the LEAD selector, testing each to the power condition combinations found in the table. Record the highest leakage current measured.

10-7-8 Isolated Patient Lead (Sink) Leakage-Isolation Test

Reference the procedure in the IEC 60601-1. When using the Dale 600, switch the meter's function selector to the LEAD-ISO. Select the ALL position on the lead selector. Depress the rocker switch to ISO TEST to test lead isolation.

CAUTION **Line voltage is applied to the ECG leads during this test. To avoid possible electric shock hazard, the system being tested must not be touched by patients, users or anyone while the ISO TEST switch is depressed.**

NOTE: It is not necessary to test each lead individually or power condition combinations as required in previous tests.

10-7-8-1 Data Sheet for ECG Leakage Current

The test passes when all readings measure less than the value shown in the table below. Record all data on the Ultrasound Inspection Certificate.

Table 10-17 Maximum Allowance Limit for ECG Leakage Current

	AC Power Source	Maximum Allowance Limit	
		GROUND OPEN	GROUND CLOSED
Patient Lead to Ground Leakage Current Test and Patient Lead to Lead Leakage Current Test	115V	10uA	10uA
	220/240V	500uA	10uA

Table 10-18 Maximum Allowance Limit for ECG Leakage Current

	AC Power Source	Maximum Allowance Limit
Patient Lead Isolation Current Test	115V	20uA
	220/240V	5mA

Table 10-19 Typical Data Sheet for ECG Leakage Current

ECG Power	Tester Polarity Switch	Tester Ground Switch	Tester Lead Selector				
			RL	RA	LA	LL	C
ON	NORM	CLOSED					
ON	REVERSE	CLOSED					
ON	NORM	OPEN					
ON	REVERSE	OPEN					
OFF	NORM	CLOSED					
OFF	REVERSE	CLOSED					
OFF	NORM	OPEN					
OFF	REVERSE	OPEN					

10-7-9 Probe Leakage Current Test

10-7-9-1 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.

10-7-9-2 Generic Procedure on Leakage Current

Measurements should be made with the ground open and closed, with power line polarity normal and reversed, and with the unit Off and On.
For each combination, the probe must be active to find the worst case condition.

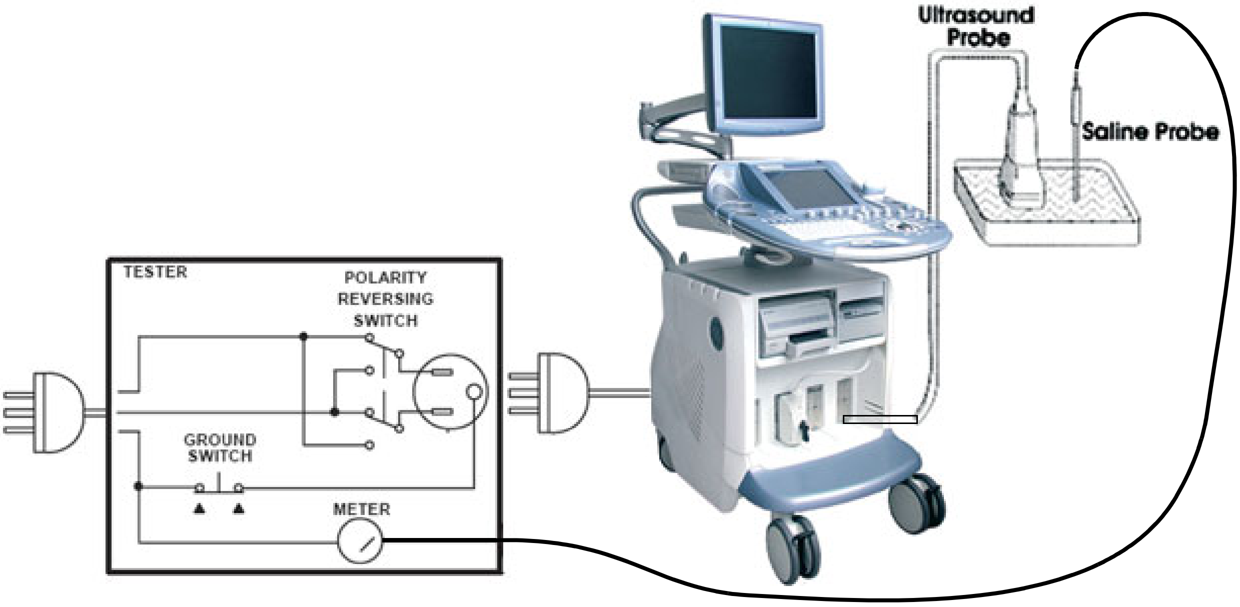


Figure 10-5 Set Up for Probe Leakage Current

Table 10-20 Typical Data Sheet for Probe Source Leakage Current

Probe Tested:				
Unit Power	**Tester Power Polarity Switch**	**Tester NEUTRAL Switch**	**Tester GROUND Switch**	**Measurement**
Start with System Powered OFF				
OFF	NORMAL	OPEN	CLOSED	
OFF	NORMAL	OPEN	OPEN	
OFF	NORMAL	CLOSED	CLOSED	
OFF	NORMAL	CLOSED	OPEN	

Table 10-20 Typical Data Sheet for Probe Source Leakage Current

Probe Tested:				
Unit Power	**Tester Power Polarity Switch**	**Tester NEUTRAL Switch**	**Tester GROUND Switch**	**Measurement**
Open Neutral first, then attempt Power ON				
ON	NORMAL	OPEN	CLOSED	
ON	NORMAL	OPEN	OPEN	
Close Neutral. Power System ON, and wait until Probe under test is active, before continuing				
ON	NORMAL	CLOSED	CLOSED	
ON	NORMAL	CLOSED	OPEN	

Keep a record of the results with other hard copies of Planned Maintenance data using Table 10-20.

Section 10-8
When There's Too Much Leakage Current...

10-8-1 Chassis 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 work around, 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 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, then the on board ones, 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 can not be corrected, submit a Safety Failure Report to document the system problem. Remove unit from operation.

10-8-6 ECG Fails

Inspect cables for damage or poor connections.

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

Functional Check (if applicable)	OK? or N/A
B-Mode Function	
M-Mode Function	
Doppler Modes Functions	
Color Modes Functions	
3D/4D-Mode Function	
Applicable Software Options	
Applicable Hardware Options	
Control Panel	
Monitor	
Touch Panel	
Measurement Accuracy	

PHYSICAL INSPECTION AND CLEANING

Physical Inspection and Cleaning (if applicable)	Inspect	Clean
Console		
Monitor		
Touch Panel		
Air Filter		
Probe Holders		
External I/O		
Wheels, Brakes & Swivel Locks		
Cables and Connectors		
Approved Peripherals (VCR, DVD Drive, Printers, etc.)		

COMMENTS:

ELECTRICAL SAFETY

Electrical Test Performed	Max Value Allowed	Value Measured	OK?	Comments
Outlet (correct ground &wiring config.)				
System Ground Continuity				
Chassis Source Leakage Current - Probe				
Chassis Source Leakage Current - Wheel				
Chassis Source Leakage Current - CRT				
Patient Lead Source Leakage (Lead to Ground)				
Patient Lead Source Leakage (Lead to Lead)				
Patient Lead Source Leakage (Isolation)				
Peripheral 1 Leakage Current				
Peripheral 1Ground Continuity				
Peripheral 2 Leakage Current				
Peripheral 2Ground Continuity				
Peripheral 3 Leakage Current				
Peripheral 3Ground Continuity				
PROBES				
Probe Number (from previous page)	**Max Value Allowed**	**Max Value Measured**	**OK?**	**Comments**
Probe 1:				
Probe 2:				
Probe 3:				
Probe 4:				
Probe 5:				
Probe 6:				
Probe 7:				
Probe 8:				
Probe 9:				

Final Check. All system covers are in place. System scans with all probes as expected.

Accepted by: ______________________________

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Appendix A
Acoustic Output & Index Determination Tables

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.

Table A-1 Tables for Transducers at different Operating Modes

Table A-1 Tables for Transducers at different Operating Modes

Table A-1 Tables for Transducers at different Operating Modes

Table A-1 Tables for Transducers at different Operating Modes

A-1-1 Tables for AB2-7-D at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: AB2-7-D **Operating Mode: B-Mode**

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt}\leq1$	$A_{aprt}>1$		
Global Maximum	Index Value			1,3	0,4	-	-	-	1,5
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,0					
	P	W_o	(mW)		49	-		-	216
	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)	1,7					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2,5	3,1	-	-	-	2,7
	Dim of A_{aprt}		X (cm)		1,8	-	-	-	7,8
			Y (cm)		1,3	-	-	-	1,3
Other Information	t_d	PD	(µsec)	0,8					
	prr	PRF	(Hz)	2470					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	1,9					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		3,0	-	-		13,0
			FL_y (cm)		7,0	-	-		7,0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	110					
Operating Control Conditions	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	28,0	28,0				4,0
	B-Imagesector angle		(Degree)	20,0	20,0				80,0
	Quality			low	low				high
	Zoom			1,0	1,0				1,0
	Foc. Zones			1	1				1
	Frequency Setting			Low	-				High
	SENS PRI			-	1,0				-
	Power		(%)	100	100				100
	ZoomBox start		(cm)	14,9	8,3				1,2
	ZoomBox end		(cm)	20,5	11,3				3,7
	ZoomBox angle		(Degree)	20,0	17,5				80,0
	Mode Type			B(Harm)	BFlow				B(Harm)
	Focal Depth		(cm)	3,0	3,0				13,0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: AB2-7-D **Operating Mode: B-Mode**

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt}\leq1$	$A_{aprt}>1$			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	2,5	3,1	-	-	3,1	-	
Output Power	P	(mW)			-	-		-	216
Bounded output Power	P_1	(mW)		27			27		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak tempora 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)	0,09					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	1,9						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,0						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			10,1
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)	1,7						

A-1-2 Tables for AB2-7-D at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: AB2-7-D **Operating Mode:** B+M Mode

Index Label					MI	TIS scan	TIS non-scan $A_{aprt}\le1\ cm^2$	TIS non-scan $A_{aprt}>1\ cm^2$	TIB non-scan	TIC
Global Maximum Index Value					1,3	0,5	-	-	-	1,3
	IEC	FDA	Units							
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)		2,0					
	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)		1,7					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)						-	
	f_{awf}	f_c	(MHz)		2,5	2,4	-	-	-	2,4
	Dim of A_{aprt}		X	(cm)		2,1	-	-	-	2,1
			Y	(cm)		1,3	-	-	-	1,3
Other Information	t_d	PD	(µsec)		0,8					
	prr	PRF	(Hz)		900					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)		1,9					
	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)		110					
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(Harm)	M(Harm)				M(Harm)
	Focal Depth		(cm)		3,0	13,0				13,0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: AB2-7-D **Operating Mode:** B+M Mode

Index			MI	TIS Scanning	TIS Non-Scanning $A_{aprt}\le1\ cm^2$	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)	2,5	2,4	-	-	2,4	-	
Output Power	P	(mW)			-	-		-	129
Bounded output Power	P_1	(mW)		41			92		
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)	0,09					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	1,9						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,0						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			2,7
Equivalent aperture diameter	D_{eq}	(cm)				-			1,9
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-1-3 Tables for AB2-7-D at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: AB2-7-D **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1$	$A_{aprt} > 1$		
Global Maximum	Index Value			1,2	-	-	0,9	1,7	1,7
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,0					
	P	W_o	(mW)		-	-		63	121
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				47,1		
	z_s	z_1	(cm)				2,4		
	z_{bp}	z_{bp}	(cm)				2,1		
	z_b	z_{sp}	(cm)					4,4	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	3,8					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,4	
	f_{awf}	f_c	(MHz)	2,6	-	-	4,0	2,6	3,2
	Dim of A_{aprt}		X (cm)		-	-	1,1	1,1	1,8
			Y (cm)		-	-	1,3	1,3	1,3
Other Information	t_d	PD	(µsec)	0,7					
	prr	PRF	(Hz)	1300					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2,6					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					0,4	
	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)	164					
Operating Control Conditions	Gate width		(cm)	0,1			0,2	0,2	0,3
	Gate pos		(cm)	2,8			5,7	5,7	8,5
	B-Imagesector angle		(Degree)	1,3			3,3	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: AB2-7-D **Operating Mode:** Pulsed Doppler

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \le 1$	$A_{aprt} > 1$			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	2,6	-	-	4,0	-	2,6	
Output Power	P	(mW)			-	93		63	121
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				47		7,7	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				771		599	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				197		266	
pulse intensity integral	I_{pi}	(mWs/cm²)	0,26					0,27	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,12					0,12	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2,6						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,0						
-12 dB output beam area	A_{aprt}	(cm²)			-	1,5			2,4
Equivalent aperture diameter	D_{eq}	(cm)				1,4			1,7
Depth for *TIS*	z_s	(cm)				2,4			
Depth for *TIB*	z_b	(cm)						4,4	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	3,8						

A-1-4 Tables for AB2-7-D at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: AB2-7-D **Operating Mode:** Color Flow

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt}\leq1$	$A_{aprt}>1$		
Global Maximum Index Value				1,3	0,8	-	-	-	1,7
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,3					
	P	W_o	(mW)		61	-		-	253
	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)	0,8					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	3,3	4,0	-	-	-	4,0
	Dim of A_{aprt}		X (cm)		1,5	-	-	-	8,0
			Y (cm)		1,3	-	-	-	1,3
Other Information	t_d	PD	(µsec)	1,3					
	prr	PRF	(Hz)	2370					
	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)		5,0	-	-		15,0
			FL_y (cm)		7,0	-	-		7,0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	185					
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			norm	norm				norm
	SENS PRI			-	-				-
	B Tx Power		(%)	1	1				1
	CFM Box start		(cm)	0,0	2,0				12,9
	CFM Box end		(cm)	4,2	6,2				17,1
	CFM Box angle		(Degree)	80,0	7,5				80,0
	CFM Tx power		(%)	100	100				100
	Ensemble			7,0	9,0				31,0
	Line Density			1	2				9
	Flow Res			low	low				low
	Velocity Range		(kHz)	7,5	0,1				3,2
	CFM Quality			low	high				norm
	CFM Frequency			mid	high				high

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: AB2-7-D **Operating Mode:** Color Flow

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt}\leq1$	$A_{aprt}>1$			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	3,3	4,0	-	-	4,0	-	
Output Power	P	(mW)			-	-		-	253
Bounded output Power	P_1	(mW)		39			39		
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)	0,36					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,29					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2,3						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,3						
-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)	0,8						

A-1-5 Tables for AB2-7-D at Color/Motion Mode (CM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: AB2-7-D **Operating Mode:** cM-Mode

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	1,1	-	-	-	1,7
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,0					
	P	W_o	(mW)		60	-		-	134
	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)	4,8					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2,6	4,0	-	-	-	3,1
	Dim of A_{aprt}	X	(cm)		0,7	-	-	-	2,3
		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)	2,9					
	d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)					-	
	Focal Length	FL_x	(cm)		3,0	-	-		15,0
		FL_y	(cm)		7,0	-	-		7,0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	153					
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	8				16
	Flow Res			high	high				high
	Velocity Range		(kHz)	0,1	0,6				1,8
	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: AB2-7-D **Operating Mode:** cM-Mode

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)	2,6	4,0	-	-	4,0	-	
Output Power	P	(mW)			-	-		-	134
Bounded output Power	P_1	(mW)		60			92		
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)	0,14					-	
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)			-	-			3,0
Equivalent aperture diameter	D_{eq}	(cm)				-			1,9
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)	4,8						

A-1-6 Tables for 4C-D at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 4C-D **Operating Mode:** B-Mode

	Index Label			MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1$	$A_{aprt} > 1$		
Global Maximum Index Value				1,3	0,8	-	-	-	1,7
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	1,8					
	P	W_o	(mW)		126	-		-	215
	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)	6,0					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2,1	2,9	-	-	-	2,4
	Dim of A_{aprt}		X (cm)		2,2	-	-	-	5,8
			Y (cm)		1,3	-	-	-	1,3
Other Information	t_d	PD	(µsec)	0,7					
	prr	PRF	(Hz)	1880					
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	3,2					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		3,0	-	-		9,0
			FL_y (cm)		6,0	-	-		6,0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	200					
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				57,6
	Quality			low	low				low
	Zoom			1,0	1,0				1,0
	Foc. Zones			1	1				1
	Frequency Setting			Mid	resol				norm
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	ZoomBox start		(cm)	6,0	1,5				6,0
	ZoomBox end		(cm)	12,0	4,0				12,0
	ZoomBox angle		(Degree)	20,0	15,0				36,3
	Mode Type			B(Harm)	B				B
	Focal Depth		(cm)	9,0	3,0				9,0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 4C-D **Operating Mode:** B-Mode

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \le 1$	$A_{aprt} > 1$			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	2,1	2,9	-	-	2,9	-	
Output Power	P	(mW)			-	-		-	215
Bounded output Power	P_1	(mW)		59			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)	0,30					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,13					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,2						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	1,8						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			7,5
Equivalent aperture diameter	D_{eq}	(cm)				-			3,1
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)	6,0						

A-1-7 Tables for 4C-D at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 4C-D **Operating Mode:** B+M Mode

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	0,5	-	-	-	1,7
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	1,8					
	P	W_o	(mW)		174	-		-	178
	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)	6,7					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2,1	2,1	-	-	-	2,2
	Dim of A_{aprt}		X (cm)		2,4	-	-	-	2,4
			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)	2,9					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		13,5	-	-		13,5
			FL_y (cm)		6,0	-	-		6,0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	188					
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)	57,6	57,6				57,6
	Quality			low	low				low
	Zoom			1,0	1,0				1,0
	Foc. Zones			1	1				1
	Frequency Setting			resol	resol				penet
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	Mode Type			M(Harm)	M(Harm)				M
	Focal Depth		(cm)	10,0	13,5				13,5

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 4C-D **Operating Mode:** B+M Mode

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning A_{aprt}≤1 cm²	Non-Scanning A_{aprt}>1 cm²	Scanning	Non-Scanning	
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	2,1	2,1	-	-	2,3	-	
Output Power	P	(mW)			-	-		-	178
Bounded output Power	P_1	(mW)		55			144		
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)	0,28					-	
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)	1,8						
-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)	6,7						

A-1-8 Tables for 4C-D at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 4C-D **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1$	$A_{aprt} > 1$		
Global Maximum Index Value				1,2	-	-	0,8	1,7	1,7
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,0					
	P	W_o	(mW)		-	-		89	78
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				50,7		
	z_s	z_1	(cm)				2,7		
	z_{bp}	z_{bp}	(cm)				2,0		
	z_b	z_{sp}	(cm)					4,3	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	4,5					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,5	
	f_{awf}	f_c	(MHz)	2,7	-	-	3,2	2,8	2,5
	Dim of A_{aprt}		X (cm)		-	-	1,1	1,1	0,8
			Y (cm)		-	-	1,3	1,3	1,3
Other Information	t_d	PD	(µsec)	1,0					
	prr	PRF	(Hz)	1300					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3,0					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					0,5	
	Focal Length		FL_x (cm)		-	-	7,0		5,0
			FL_y (cm)		-	-	6,0		6,0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	178					
Operating Control Conditions	Gate width		(cm)	0,1			0,4	0,3	0,1
	Gate pos		(cm)	3,0			3,2	3,1	0,0
	B-Imagesector angle		(Degree)	1,3			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: 4C-D **Operating Mode:** Pulsed Doppler

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \le 1$	$A_{aprt} > 1$			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	2,7	-	-	3,2	-	2,8	
Output Power	P	(mW)			-	90		89	78
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				51		7,7	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				763		656	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				275		275	
pulse intensity integral	I_{pi}	(mWs/cm²)	0,39					0,50	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,17					0,21	
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)			-	1,4			1,0
Equivalent aperture diameter	D_{eq}	(cm)				1,3			1,1
Depth for *TIS*	z_s	(cm)				2,7			
Depth for *TIB*	z_b	(cm)						4,3	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	4,5						

A-1-9 Tables for 4C-D at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 4C-D **Operating Mode:** Color Flow

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1$	$A_{aprt} > 1$		
Global Maximum Index Value				1,3	1,1	-	-	-	1,7
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,0					
	P	W_o	(mW)		108	-		-	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)	4,8					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2,5	3,2	-	-	-	3,1
	Dim of A_{aprt}		X (cm)		1,5	-	-	-	3,0
			Y (cm)		1,3	-	-	-	1,3
Other Information	t_d	PD	(µsec)	0,6					
	prr	PRF	(Hz)	5680					
	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)		3,0	-	-		9,0
			FL_y (cm)		6,0	-	-		6,0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	185					
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)	57,6	20,0				20,0
	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)	4,3	0,0				6,4
	CFM Box end		(cm)	8,8	4,5				10,9
	CFM Box angle		(Degree)	57,6	7,1				7,1
	CFM Tx power		(%)	100	100				100
	Ensemble			11,0	7,0				9,0
	Line Density			10	1				2
	Flow Res			high	low				low
	Velocity Range		(kHz)	6	9,0				0,1
	CFM Quality			low	low				high
	CFM Frequency			mid	high				high

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 4C-D **Operating Mode:** Color Flow

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning $A_{aprt} \le 1$	Non-Scanning $A_{aprt} > 1$	Scanning	Non-Scanning	
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	2,5	3,2	-	-	3,2	-	
Output Power	P	(mW)			-	-		-	154
Bounded output Power	P_1	(mW)		71			71		
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)	0,25					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,11					-	
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)			-	-			3,9
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)	4,8						

A-1-10 Tables for 4C-D at Color/Motion Mode (CM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 4C-D **Operating Mode:** cM-Mode

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	0,8	-	-	-	1,7
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,0					
	P	W_o	(mW)		91	-		-	173
	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)	4,8					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2,5	3,0	-	-	-	2,4
	Dim of A_{aprt}		X (cm)		1,2	-	-	-	3,3
			Y (cm)		1,3	-	-	-	1,3
Other Information	t_d	PD	(µsec)	0,6					
	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)		5,0	-	-		15,0
			FL_y (cm)		6,0	-	-		6,0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	185					
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	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		(%)	97	1				95
	Mc Tx Power		(%)	100	100				100
	Ensemble			16	8				8
	Flow Res			high	high				high
	Velocity Range		(kHz)	0,1	6,0				1,8
	Speed			6,0	6,0				6,0
	Mc Frequency			Mid	High				Mid

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 4C-D **Operating Mode:** cM-Mode

Index: notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units	MI	TIS Scanning	TIS Non-Scanning $A_{aprt} \le 1$ cm²	TIS Non-Scanning $A_{aprt} > 1$ cm²	TIB Scanning	TIB Non-Scanning	TIC
Acoustic working frequency	f_{awf}	(MHz)	2,5	3,0	-	-	3,1	-	
Output Power	P	(mW)			-	-		-	173
Bounded output Power	P_1	(mW)		59			117		
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)	0,25					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,11					-	
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)			-	-			4,3
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)	4,8						

A-1-11 Tables for M6C at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: **M6C** **Operating Mode:** B-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1$	$A_{aprt} > 1$		
Global Maximum Index Value				1,2	0,5	-	-	-	1,7
	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,2					
	P	W_o	(mW)		242	-		-	269
	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)	3,2	3,3	-	-	-	3,2
	Dim of A_{aprt}		X (cm)		7,0	-	-	-	7,8
			Y (cm)		1,5	-	-	-	1,5
	t_d	PD	(µsec)	0,4					
	prr	PRF	(Hz)	2580					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2,4					
Other	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
Information	Focal Length		FL_x (cm)		8,0	-	-		11,0
			FL_y (cm)		7,8	-	-		7,8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	170					
	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	26,0	26,0				26,0
	B-Imagesector angle		(Degree)	20,0	60,0				60,0
	Quality			low	high				low
Operating	Zoom			1,0	1,0				1,0
Control	Foc. Zones			1	1				1
Conditions	Frequency Setting			High	norm				norm
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	ZoomBox start		(cm)	2,6	8,7				14,7
	ZoomBox end		(cm)	7,8	13,9				19,9
	ZoomBox angle		(Degree)	20,0	60,0				60,0
	Mode Type			B(Harm)	B(CE)				B(CE)
	Focal Depth		(cm)	1,8	8,0				11,0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: **M6C** **Operating Mode:** B-Mode

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \le 1$	$A_{aprt} > 1$			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	3,2	3,3	-	-	3,3	-	
Output Power	P	(mW)			-	-		-	269
Bounded output Power	P_1	(mW)		34			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)	0,09					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,07					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2,4						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,2						
-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)	1,4						

A-1-12 Tables for M6C at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: M6C **Operating Mode:** B+M Mode

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	0,3	-	-	-	0,9
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,2					
	P	W_o	(mW)		71	-		-	89
	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)	3,2	2,6	-	-	-	2,6
	Dim of A_{aprt}		X (cm)		1,6	-	-	-	2,0
			Y (cm)		1,5	-	-	-	1,5
Other Information	t_d	PD	(µsec)	0,4					
	prr	PRF	(Hz)	450					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2,4					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		10,0	-	-		12,0
			FL_y (cm)		7,8	-	-		7,8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	170					
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)	60,0	60,0				60,0
	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(Harm)				M(Harm)
	Focal Depth		(cm)	1,8	10,0				12,0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: M6C **Operating Mode:** B+M Mode

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)	3,2	2,6	-	-	2,6	-	
Output Power	P	(mW)			-	-		-	89
Bounded output Power	P_1	(mW)		23			54		
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)	0,09					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,07					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2,4						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,2						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			3,0
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)	1,4						

A-1-13 Tables for M6C at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: M6C **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS scan	TIS non-scan $A_{aprt} \le 1$	TIS non-scan $A_{aprt} > 1$	TIB non-scan	TIC
Global Maximum	Index Value			1,1	-	1,3	-	1,7	1,7
	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,2					
	P	W_o	(mW)		-	70		53	83
	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)					2,5	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	2,6					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,4	
	f_{awf}	f_c	(MHz)	3,8	-	3,9	-	3,3	3,4
	Dim of A_{aprt}	X	(cm)		-	1,0	-	0,8	1,3
		Y	(cm)		-	0,9	-	0,9	0,9
	t_d	PD	(µsec)	0,4					
	prr	PRF	(Hz)	1300					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2,9					
Other	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					0,4	
Information	Focal Length	FL_x	(cm)		-	8,0	-		10,0
		FL_y	(cm)		-	7,8	-		7,8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	363					
Operating	Gate width		(cm)	0,1		0,1		0,1	0,2
Control	Gate pos		(cm)	0,0		5,2		2,6	5,3
Conditions	B-Imagesector angle		(Degree)	1,3		2,2		1,3	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: M6C **Operating Mode:** Pulsed Doppler

Index			MI	TIS Scanning	TIS Non-Scanning $A_{aprt} \le 1$	TIS Non-Scanning $A_{aprt} > 1$	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	-	3,9	-	-	3,3	
Output Power	P	(mW)			70	-		53	83
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				-		7,3	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				-		226	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		118	
pulse intensity integral	I_{pi}	(mWs/cm²)	0,28					0,17	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,14					0,09	
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)			0,9	-			1,1
Equivalent aperture diameter	D_{eq}	(cm)				-			1,2
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						2,5	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	2,6						

A-1-14 Tables for M6C at Color Flow Mode (CFM-Mode)

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: M6C **Operating Mode:** Color Flow

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning $A_{aprt}\leq1$	Non-Scanning $A_{aprt}>1$	Scanning	Non-Scanning	
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	3,4	3,9	-	-	3,9	-	
Output Power	P	(mW)			-	-		-	191
Bounded output Power	P_1	(mW)		57			57		
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)	0,53					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,26					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,1						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,3						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			5,9
Equivalent aperture diameter	D_{eq}	(cm)				-			2,7
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)	3,1						

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: M6C **Operating Mode:** Color Flow

Index Label					MI	TIS			TIB	TIC
						scan	non-scan $A_{aprt}\leq1$	non-scan $A_{aprt}>1$	non-scan	
Global Maximum Index Value					1,3	1,1	-	-	-	1,7
Assoc. Acoustic Parameter	**IEC**	**FDA**		**Units**						
	$p_{r\alpha}$	$p_{r.3}$		(MPa)	2,3					
	P	W_o		(mW)		114	-		-	191
	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)	3,1					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$		(cm)					-	
	f_{awf}	f_c		(MHz)	3,4	3,9	-	-	-	3,4
	Dim of A_{aprt}		X	(cm)		2,0	-	-	-	6,6
			Y	(cm)		1,5	-	-	-	0,9
Other Information	t_d	PD		(µsec)	0,8					
	prr	PRF		(Hz)	2410					
	p_r at max. I_{pi}	p_r@PII_{max}		(MPa)	3,1					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}		(cm)					-	
	Focal Length		FL_x	(cm)		8,0	-	-		6,0
			FL_y	(cm)		7,8	-	-		7,8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}		(W/cm²)	230					
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)	60,0	20,0				60,0
	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)	1,8	5,5				3,7
	CFM Box end			(cm)	5,7	9,4				7,6
	CFM Box angle			(Degree)	60,0	7,2				60,0
	CFM Tx power			(%)	100	100				100
	Ensemble				7,0	22,0				7,0
	Line Density				1	1				1
	Flow Res				high	high				low
	Velocity Range			(kHz)	7,5	6,0				6,0
	CFM Quality				low	low				low
	CFM Frequency				mid	high				mid

A-1-15 Tables for M6C at Color/Motion Mode (CM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: **M6C** **Operating Mode:** cM-Mode

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	1,1	-	-	-	1,7
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,3					
	P	W_o	(mW)		58	-		-	136
	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)	1,5					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	3,5	3,9	-	-	-	2,8
	Dim of A_{aprt}		X (cm)		0,9	-	-	-	2,0
			Y (cm)		0,9	-	-	-	1,5
Other Information	t_d	PD	(µsec)	0,8					
	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)		4,5	-	-		12,0
			FL_y (cm)		7,8	-	-		7,8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	259					
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	60				60
	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		(%)	100	1				1
	Mc Tx Power		(%)	100	100				100
	Ensemble			16	8				8
	Flow Res			high	high				high
	Velocity Range		(kHz)	0,1	1,3				1,8
	Speed			6,0	6,0				6,0
	Mc Frequency			Mid	High				Low

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: **M6C** **Operating Mode:** cM-Mode

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)	3,5	3,9	-	-	4,0	-	
Output Power	P	(mW)			-	-		-	136
Bounded output Power	P_1	(mW)		58			91		
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)	0,28					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,19					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2,8						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,3						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			3,0
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)	1,5						

A-1-16 Tables for M6C at Continuous Wave Doppler (CW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: M6C **Operating Mode:** Continuous Wave

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1$ cm²	$A_{aprt} > 1$ cm²		
Global Maximum	Index Value			0,1	-	0,2	-	1,2	0,8
	IEC	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	0,1					
	P	W_o	(mW)		-	17		17	17
	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)					1,0	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	1,0					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,3	
	f_{awf}	f_c	(MHz)	2,7	-	2,7	-	2,7	2,7
	Dim of A_{aprt}		X (cm)		-	0,5	-	0,5	0,5
			Y (cm)		-	0,5	-	0,5	0,5
	t_d	PD	(µsec)	5,1					
	prr	PRF	(Hz)	-					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	0,1					
Other	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					0,3	
Information	Focal Length		FL_x (cm)		-	6,0	-		6,0
			FL_y (cm)		-	7,8	-		7,8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	0					
Operating	Velocity Range		(kHz)	10,1		10,1		10,1	10,1
Control	Power		(%)	100,0		100,0		100,0	100,0
Conditions									

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: M6C **Operating Mode:** Continuous Wave

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)	2,7	-	2,7	-	-	2,7	
Output Power	P	(mW)			17	-		17	17
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				-		13,8	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				-		320	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		266	
pulse intensity integral	I_{pi}	(mWs/cm²)	-					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	-					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	0,1						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	0,1						
-12 dB output beam area	A_{aprt}	(cm²)			0,2	-			0,2
Equivalent aperture diameter	D_{eq}	(cm)				-			0,5
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						1,0	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1,0						

A-1-17 Tables for IC5-9-D at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: IC5-9-D **Operating Mode:** B-Mode

Index Label				MI	TIS scan	TIS non-scan $A_{aprt}\le1$	TIS non-scan $A_{aprt}>1$	TIB non-scan	TIC
Global Maximum	Index Value			1,2	0,3	-	-	-	0,7
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,7					
	P	W_o	(mW)		26	-		-	48
	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	4,6	-	-	-	4,3
	Dim of A_{aprt}	X	(cm)		2,1	-	-	-	3,8
		Y	(cm)		0,6	-	-	-	0,6
Other Information	t_d	PD	(µsec)	0,4					
	prr	PRF	(Hz)	4190					
	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)		1,0	-	-		6,0
		FL_y	(cm)		3,5	-	-		3,5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	250					
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			high	high				low
	Zoom			1,0	1,0				1,0
	Foc. Zones			1	1				1
	Frequency Setting			High	Mid				Mid
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	ZoomBox start		(cm)	2,1	2,1				11,7
	ZoomBox end		(cm)	5,3	5,3				14,9
	ZoomBox angle		(Degree)	146,3	87,8				146,3
	Mode Type			B(Harm)	B(Harm)				B(Harm)
	Focal Depth		(cm)	3,0	1,0				6,0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: IC5-9-D **Operating Mode:** B-Mode

notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units	MI	TIS Scanning	TIS Non-Scanning $A_{aprt}\le1$	TIS Non-Scanning $A_{aprt}>1$	TIB Scanning	TIB Non-Scanning	TIC
Acoustic working frequency	f_{awf}	(MHz)	4,7	4,6	-	-	4,6	-	
Output Power	P	(mW)			-	-		-	48
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)	0,17					-	
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)	2,7						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			2,3
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)	2,1						

A-1-18 Tables for IC5-9-D at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: IC5-9-D **Operating Mode:** B+M Mode

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	0,3	-	-	-	0,6
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,6					
	P	W_o	(mW)		33	-		-	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)					-	
	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	4,4	-	-	-	4,4
	Dim of A_{aprt}		X (cm)		0,9	-	-	-	0,9
			Y (cm)		0,6	-	-	-	0,6
Other Information	t_d	PD	(µsec)	0,4					
	prr	PRF	(Hz)	450					
	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)		4,5	-	-		4,5
			FL_y (cm)		3,5	-	-		3,5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	250					
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	norm				norm
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	Mode Type			M(Harm)	M(Harm)				M(Harm)
	Focal Depth		(cm)	3,0	4,5				4,5

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: IC5-9-D **Operating Mode:** B+M Mode

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	4,4	-	-	4,6	-	
Output Power	P	(mW)			-	-		-	33
Bounded output Power	P_1	(mW)		16			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)	0,17					-	
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)	2,6						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			0,6
Equivalent aperture diameter	D_{eq}	(cm)				-			0,8
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)	2,1						

A-1-19 Tables for IC5-9-D at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: IC5-9-D **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1	A_{aprt}>1		
Global Maximum	Index Value			1,2	-	0,8	-	0,8	1,0
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,7					
	P	W_o	(mW)		-	33		33	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)					0,4	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	1,8					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,8	
	f_{awf}	f_c	(MHz)	4,9	-	5,2	-	5,2	5,2
	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)	0,5					
	prr	PRF	(Hz)	1300					
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	3,6					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					0,5	
	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)	238					
Operating Control Conditions	Gate width		(cm)	0,1		0,5		0,5	0,5
	Gate pos		(cm)	0,0		9,6		9,6	9,6
	B-Imagesector angle		(Degree)	1,3		5,5		5,5	5,5
	Power		(%)	100		100		100	100

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: IC5-9-D **Operating Mode:** Pulsed Doppler

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1	A_{aprt}>1			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	4,9	-	5,2	-	-	5,2	
Output Power	P	(mW)			33	-		33	33
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				-		3,5	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				-		270	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		127	
pulse intensity integral	I_{pi}	(mWs/cm²)	0,22					0,05	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,12					0,02	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,6						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,7						
-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)						0,4	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1,8						

A-1-20 Tables for IC5-9-D at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: IC5-9-D **Operating Mode:** Color Flow

Index Label				MI	TIS scan	TIS non-scan $A_{aprt}\leq1$	TIS non-scan $A_{aprt}>1$	TIB non-scan	TIC
Global Maximum Index Value				1,2	0,4	-	-	-	0,9
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,7					
	P	W_o	(mW)		53	-		-	59
	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)	5,2	6,3	-	-	-	5,1
	Dim of A_{aprt}	X	(cm)		3,8	-	-	-	4,0
		Y	(cm)		0,6	-	-	-	0,6
Other Information	t_d	PD	(µsec)	0,8					
	prr	PRF	(Hz)	1420					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3,2					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length	FL_x	(cm)		6,0	-	-		8,0
		FL_y	(cm)		3,5	-	-		3,5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	353					
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	5,1				6,2
	CFM Box end		(cm)	2,4	7,5				8,6
	CFM Box angle		(Degree)	146,3	146,3				146,3
	CFM Tx power		(%)	100	100				100
	Ensemble			7,0	7,0				7,0
	Line Density			1	1				2
	Flow Res			low	low				high
	Velocity Range		(kHz)	0,1	6,0				6,0
	CFM Quality			low	low				high
	CFM Frequency			low	high				low

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: IC5-9-D **Operating Mode:** Color Flow

notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units	MI	TIS Scanning	TIS Non-Scanning $A_{aprt}\leq1$	TIS Non-Scanning $A_{aprt}>1$	TIB Scanning	TIB Non-Scanning	TIC
Acoustic working frequency	f_{awf}	(MHz)	5,2	6,3	-	-	6,3	-	
Output Power	P	(mW)			-	-		-	59
Bounded output Power	P_1	(mW)		14			14		
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)	0,41					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,29					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,2						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,7						
-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)	0,9						

A-1-21 Tables for IC5-9-D at Color/Motion Mode (CM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: IC5-9-D **Operating Mode:** cM-Mode

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				1,2	1,4	-	-	-	1,2
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3,1					
	P	W_o	(mW)		47	-		-	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)	0,9					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	6,1	6,2	-	-	-	6,2
	Dim of A_{aprt}		X (cm)		1,3	-	-	-	1,3
			Y (cm)		0,6	-	-	-	0,6
Other Information	t_d	PD	(µsec)	0,4					
	prr	PRF	(Hz)	150					
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	3,5					
	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)	242					
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	20				20
	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
	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			High	High				High

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: IC5-9-D **Operating Mode:** cM-Mode

notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units	MI	TIS Scanning	TIS Non-Scanning $A_{aprt} \le 1$ cm²	TIS Non-Scanning $A_{aprt} > 1$ cm²	TIB Scanning	TIB Non-Scanning	TIC
Acoustic working frequency	f_{awf}	(MHz)	6,1	6,2	-	-	5,2	-	
Output Power	P	(mW)			-	-		-	47
Bounded output Power	P_1	(mW)		47			66		
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)	0,29					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,14					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,5						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3,1						
-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-1-22 Tables for SP10-16-D at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: SP10-16-D **Operating Mode:** B-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1	A_{aprt}>1		
Global Maximum Index Value				1,3	0,2	-	-	-	0,3
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3,5					
	P	W_o	(mW)		4	-		-	17
	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)	7,8	9,9	-	-	-	9,7
	Dim of A_{aprt}		X (cm)		1,1	-	-	-	5,1
			Y (cm)		0,3	-	-	-	0,3
Other Information	t_d	PD	(µsec)	0,2					
	prr	PRF	(Hz)	5490					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	4,6					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		0,4	-	-		4,5
			FL_y (cm)		1,5	-	-		1,5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	419					
Operating Control Conditions	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	4,5	4,5				4,5
	B-Imagesector width		(cm)	3,4	3,4				3,4
	Quality			low	high				low
	Zoom			1,0	1,0				1,0
	Foc. Zones			1	1				1
	Frequency Setting			High	resol				norm
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	ZoomBox start		(cm)	0,0	2,9				3,4
	ZoomBox end		(cm)	1,0	3,9				4,4
	ZoomBox width		(cm)	2,1	0,8				3,4
	Mode Type			B(Harm)	B				B
	Focal Depth		(cm)	1,4	0,4				4,5

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: SP10-16-D **Operating Mode:** B-Mode

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1	A_{aprt}>1			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	7,8	9,9	-	-	9,9	-	
Output Power	P	(mW)			-	-		-	17
Bounded output Power	P_1	(mW)		3			3		
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)	4,6						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3,5						
-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-1-23 Tables for SP10-16-D at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: SP10-16-D **Operating Mode:** B+M Mode

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	0,2	-	-	-	0,2
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3,5					
	P	W_o	(mW)		11	-		-	11
	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)	7,8	9,9	-	-	-	9,9
	Dim of A_{aprt}	X	(cm)		1,7	-	-	-	1,7
		Y	(cm)		0,3	-	-	-	0,3
Other Information	t_d	PD	(µsec)	0,2					
	prr	PRF	(Hz)	450					
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	4,6					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					-	
	Focal Length	FL_x	(cm)		4,5	-	-		4,5
		FL_y	(cm)		1,5	-	-		1,5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	419					
Operating Control Conditions	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	6,0	6,0				6,0
	B-Imagesector width		(cm)	3,4	3,4				3,4
	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				M
	Focal Depth		(cm)	1,4	4,5				4,5

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: SP10-16-D **Operating Mode:** B+M Mode

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)	7,8	9,9	-	-	8,6	-	
Output Power	P	(mW)			-	-		-	11
Bounded output Power	P_1	(mW)		3			3		
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)	4,6						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3,5						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			0,5
Equivalent aperture diameter	D_{eq}	(cm)				-			0,8
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)	1,2						

A-1-24 Tables for SP10-16-D at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: SP10-16-D **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt}\le1$	$A_{aprt}>1$		
Global Maximum Index Value				1,3	-	1,2	-	1,5	0,9
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3,7					
	P	W_o	(mW)		-	27		27	27
	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)					0,6	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	1,1					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,3	
	f_{awf}	f_c	(MHz)	8,7	-	9,0	-	9,0	9,0
	Dim of A_{aprt}		X (cm)		-	1,4	-	1,4	1,4
			Y (cm)		-	0,3	-	0,3	0,3
Other Information	t_d	PD	(µsec)	0,3					
	prr	PRF	(Hz)	1300					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	5,0					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					0,3	
	Focal Length		FL_x (cm)		-	4,2	-		4,2
			FL_y (cm)		-	1,5	-		1,5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	401					
Operating Control Conditions	Gate width		(cm)	0,1		0,3		0,3	0,3
	Gate pos		(cm)	0,0		2,3		2,3	2,3
	B-Imagesector angle		(Degree)	1,3		2,2		2,2	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: SP10-16-D **Operating Mode:** Pulsed Doppler

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt}\le1$	$A_{aprt}>1$			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	8,7	-	9,0	-	-	9,0	
Output Power	P	(mW)			27	-		27	27
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				-		6,4	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				-		372	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		235	
pulse intensity integral	I_{pi}	(mWs/cm²)	0,23					0,17	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,12					0,11	
Peak-rarefactional acoustic pressure	p_r	(MPa)	5,0						
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)						0,6	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1,1						

A-1-25 Tables for SP10-16-D at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: SP10-16-D **Operating Mode:** Color Flow

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1$	$A_{aprt} > 1$		
Global Maximum Index Value				1,2	0,4	-	-	-	0,8
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3,7					
	P	W_o	(mW)		43	-		-	44
	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)	0,4					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	9,0	9,1	-	-	-	7,8
	Dim of A_{aprt}		X (cm)		5,2	-	-	-	5,2
			Y (cm)		0,3	-	-	-	0,3
Other Information	t_d	PD	(µsec)	0,5					
	prr	PRF	(Hz)	3930					
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	4,2					
	d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		4,2	-	-		4,2
			FL_y (cm)		1,5	-	-		1,5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	781					
Operating Control Conditions	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	4,5	4,5				4,5
	B-Imagesector width		(cm)	3,4	3,4				3,4
	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	3,5				3,5
	CFM Box end		(cm)	0,7	4,2				4,2
	CFM Box width		(cm)	3,4	3,4				3,4
	CFM Tx power		(%)	100	100				100
	Ensemble			22,0	11,0				9,0
	Line Density			1	8				8
	Flow Res			high	low				low
	Velocity Range		(kHz)	0,1	11,0				11,0
	CFM Quality			low	low				high
	CFM Frequency			high	high				low

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: SP10-16-D **Operating Mode:** Color Flow

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning $A_{aprt} \le 1$	Non-Scanning $A_{aprt} > 1$	Scanning	Non-Scanning	
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	9,0	9,1	-	-	9,1	-	
Output Power	P	(mW)			-	-		-	44
Bounded output Power	P_1	(mW)		8			8		
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)	0,51					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,40					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	4,2						
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)	0,4						

A-1-26 Tables for 9L-D at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 9L-D **Operating Mode:** B-Mode

Index Label				MI	TIS scan	TIS non-scan $A_{aprt}\le1$	TIS non-scan $A_{aprt}>1$	TIB non-scan	TIC
Global Maximum Index Value				1,3	0,9	-	-	-	1,7
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,6					
	P	W_o	(mW)		58	-		-	149
	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)	0,4					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	4,2	4,0	-	-	-	4,0
	Dim of A_{aprt}		X (cm)		1,2	-	-	-	6,1
			Y (cm)		0,6	-	-	-	0,6
Other Information	t_d	PD	(µsec)	0,3					
	prr	PRF	(Hz)	4990					
	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)		0,6	-	-		6,5
			FL_y (cm)		2,1	-	-		2,1
	$I_{pa,\alpha}$ 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)	14,0	14,0				14,0
	B-Imagesector width		(cm)	4,3	4,3				4,3
	Quality			high	high				high
	Zoom			1,0	1,0				1,0
	Foc. Zones			1	1				1
	Frequency Setting			Mid	Low				Low
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	ZoomBox start		(cm)	0,0	0,5				9,8
	ZoomBox end		(cm)	2,8	3,3				12,6
	ZoomBox width		(cm)	0,9	0,9				4,3
	Mode Type			B(Harm)	B(Harm)				B(Harm)
	Focal Depth		(cm)	0,6	0,6				6,5

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 9L-D **Operating Mode:** B-Mode

Index			MI	TIS Scanning	TIS Non-Scanning $A_{aprt}\le1$	TIS Non-Scanning $A_{aprt}>1$	TIB Scanning	TIB Non-Scanning	TIC
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	4,2	4,0	-	-	4,0	-	
Output Power	P	(mW)			-	-		-	149
Bounded output Power	P_1	(mW)		49			49		
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)	0,07					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,06					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2,8						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,6						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			3,6
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)	0,4						

A-1-27 Tables for 9L-D at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 9L-D **Operating Mode:** B+M Mode

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	0,7	-	-	-	1,6
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,7					
	P	W_o	(mW)		104	-		-	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)	1,8					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	4,8	4,1	-	-	-	4,1
	Dim of A_{aprt}		X (cm)		1,3	-	-	-	1,3
			Y (cm)		0,6	-	-	-	0,6
Other Information	t_d	PD	(µsec)	0,3					
	prr	PRF	(Hz)	900					
	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)		4,5	-	-		4,5
			FL_y (cm)		2,1	-	-		2,1
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	433					
Operating Control Conditions	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	14,0	14,0				14,0
	B-Imagesector width		(cm)	4,3	4,3				4,3
	Quality			low	low				low
	Zoom			1,0	1,0				1,0
	Foc. Zones			1	1				1
	Frequency Setting			norm	resol				resol
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	Mode Type			M	M(Harm)				M(Harm)
	Focal Depth		(cm)	1,9	4,5				4,5

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 9L-D **Operating Mode:** B+M Mode

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)	4,8	4,1	-	-	4,6	-	
Output Power	P	(mW)			-	-		-	104
Bounded output Power	P_1	(mW)		38			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)	0,24					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,13					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,6						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,7						
-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)	1,8						

A-1-28 Tables for 9L-D at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 9L-D **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS scan	TIS non-scan $A_{aprt} \le 1$	TIS non-scan $A_{aprt} > 1$	TIB non-scan	TIC
Global Maximum Index Value				1,2	-	1,7	-	1,5	1,7
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,9					
	P	W_o	(mW)		-	57		63	64
	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)					1,5	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	1,8					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,6	
	f_{awf}	f_c	(MHz)	5,5	-	6,4	-	4,9	5,7
	Dim of A_{aprt}		X (cm)		-	1,2	-	1,2	1,2
			Y (cm)		-	0,6	-	0,6	0,6
Other Information	t_d	PD	(µsec)	0,6					
	prr	PRF	(Hz)	1300					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3,9					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					0,5	
	Focal Length		FL_x (cm)		-	5,0	-		5,0
			FL_y (cm)		-	2,1	-		2,1
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	305					
Operating Control Conditions	Gate width		(cm)	0,1		0,1		0,2	0,2
	Gate pos		(cm)	0,0		2,8		2,9	2,9
	B-Imagesector angle		(Degree)	1,3		4,4		2,2	4,4
	Power		(%)	100		100		100	100

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 9L-D **Operating Mode:** Pulsed Doppler

Index			MI	TIS Scanning	TIS Non-Scanning $A_{aprt} \le 1$	TIS Non-Scanning $A_{aprt} > 1$	TIB Scanning	TIB Non-Scanning	TIC
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	5,5	-	6,4	-	-	4,9	
Output Power	P	(mW)			57	-		63	64
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				-		6,6	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				-		600	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		302	
pulse intensity integral	I_{pi}	(mWs/cm²)	0,37					0,27	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,19					0,14	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,9						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,9						
-12 dB output beam area	A_{aprt}	(cm²)			0,7	-			0,7
Equivalent aperture diameter	D_{eq}	(cm)				-			0,9
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						1,5	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1,8						

A-1-29 Tables for 9L-D at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 9L-D **Operating Mode:** Color Flow

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1$	$A_{aprt} > 1$		
Global Maximum Index Value				1,2	1,5	-	-	-	1,7
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3,1					
	P	W_o	(mW)		55	-		-	146
	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)	2,0					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	6,4	5,8	-	-	-	5,7
	Dim of A_{aprt}		X (cm)		0,9	-	-	-	5,8
			Y (cm)		0,6	-	-	-	0,6
Other Information	t_d	PD	(µsec)	0,9					
	prr	PRF	(Hz)	990					
	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)		0,7	-	-		5,0
			FL_y (cm)		2,1	-	-		2,1
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	428					
Operating Control Conditions	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	14,0	14,0				14,0
	B-Imagesector width		(cm)	4,3	4,3				4,3
	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)	1,0	0,0				3,5
	CFM Box end		(cm)	3,1	2,1				5,6
	CFM Box width		(cm)	0,7	0,7				4,3
	CFM Tx power		(%)	100	100				100
	Ensemble			22,0	7,0				9,0
	Line Density			1	10				2
	Flow Res			low	low				low
	Velocity Range		(kHz)	0,1	0,1				9,0
	CFM Quality			low	low				high
	CFM Frequency			high	mid				mid

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 9L-D **Operating Mode:** Color Flow

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning $A_{aprt} \le 1$	Non-Scanning $A_{aprt} > 1$	Scanning	Non-Scanning	
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	6,4	5,8	-	-	5,8	-	
Output Power	P	(mW)			-	-		-	146
Bounded output Power	P_1	(mW)		55			55		
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)	1,18					-	
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)	3,1						
-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)	2,0						

A-1-30 Tables for 9L-D at Continuous Wave Doppler (CW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 9L-D **Operating Mode:** Continuous Wave

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				0,0	-	0,3	-	0,9	0,6
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	0,1					
	P	W_o	(mW)		-	13		13	13
	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)					1,7	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	1,7					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,2	
	f_{awf}	f_c	(MHz)	4,1	-	4,1	-	4,1	4,1
	Dim of A_{aprt}	X	(cm)		-	0,4	-	0,4	0,4
		Y	(cm)		-	0,6	-	0,6	0,6
Other Information	t_d	PD	(µsec)	5,0					
	prr	PRF	(Hz)	-					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	0,1					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					0,2	
	Focal Length	FL_x	(cm)		-	4,0	-		4,0
		FL_y	(cm)		-	2,1	-		2,1
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	0					
Operating Control Conditions	Velocity Range		(kHz)	10,1		10,1		10,1	10,1
	Power		(%)	100,0		100,0		100,0	100,0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 9L-D **Operating Mode:** Continuous Wave

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)	4,1	-	4,1	-	-	4,1	
Output Power	P	(mW)			13	-		13	13
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				-		8,1	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				-		484	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		279	
pulse intensity integral	I_{pi}	(mWs/cm²)	-					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	-					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	0,1						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	0,1						
-12 dB output beam area	A_{aprt}	(cm²)			0,2	-			0,2
Equivalent aperture diameter	D_{eq}	(cm)				-			0,5
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						1,7	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1,7						

A-1-31 Tables for 11L-D at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 11L-D **Operating Mode:** B-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1$	$A_{aprt} > 1$		
Global Maximum	Index Value			1,3	0,8	-	-	-	1,7
	IEC	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3,0					
	P	W_o	(mW)		35	-		-	113
	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)	1,2					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	5,9	5,1	-	-	-	4,7
	Dim of A_{aprt}		X (cm)		1,0	-	-	-	5,2
			Y (cm)		0,4	-	-	-	0,4
	t_d	PD	(µsec)	1,1					
	prr	PRF	(Hz)	1270					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3,4					
Other	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
Information	Focal Length		FL_x (cm)		0,4	-	-		5,0
			FL_y (cm)		1,3	-	-		1,3
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	224					
	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			high	high				low
Operating	Zoom			1,0	1,0				1,0
Control	Foc. Zones			1	1				1
Conditions	Frequency Setting			norm	Mid				Low
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	ZoomBox start		(cm)	0,0	0,0				4,2
	ZoomBox end		(cm)	1,6	1,6				5,8
	ZoomBox width		(cm)	0,8	0,8				3,7
	Mode Type			B(CE)	B(Harm)				B(Harm)
	Focal Depth		(cm)	3,2	0,4				5,0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 11L-D **Operating Mode:** B-Mode

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \le 1$	$A_{aprt} > 1$			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	5,9	5,1	-	-	5,1	-	
Output Power	P	(mW)			-	-		-	113
Bounded output Power	P_1	(mW)		35			35		
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)	0,47					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,25					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,4						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3,0						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			2,1
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)	1,2						

A-1-32 Tables for 11L-D at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 11L-D **Operating Mode:** B+M Mode

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	0,7	-	-	-	1,5
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3,1					
	P	W_o	(mW)		82	-		-	79
	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)	1,0					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	6,2	5,0	-	-	-	5,0
	Dim of A_{aprt}		X (cm)		1,4	-	-	-	1,1
			Y (cm)		0,4	-	-	-	0,4
Other Information	t_d	PD	(µsec)	0,2					
	prr	PRF	(Hz)	900					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3,8					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		5,0	-	-		4,0
			FL_y (cm)		1,3	-	-		1,3
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	425					
Operating Control Conditions	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	11,0	11,0				11,0
	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	norm				norm
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	Mode Type			M	M(Harm)				M(Harm)
	Focal Depth		(cm)	0,9	5,0				4,0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 11L-D **Operating Mode:** B+M Mode

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	5,0	-	-	5,0	-	
Output Power	P	(mW)			-	-		-	79
Bounded output Power	P_1	(mW)		30			30		
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)	0,15					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,09					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,8						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3,1						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			0,4
Equivalent aperture diameter	D_{eq}	(cm)				-			0,8
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-1-33 Tables for 11L-D at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 11L-D **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1$	$A_{aprt} > 1$		
Global Maximum Index Value				1,3	-	1,6	-	1,7	1,7
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,9					
	P	W_o	(mW)		-	48		43	44
	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)					1,0	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	1,1					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,4	
	f_{awf}	f_c	(MHz)	5,3	-	6,9	-	5,2	6,9
	Dim of A_{aprt}		X (cm)		-	1,0	-	1,0	0,8
			Y (cm)		-	0,4	-	0,4	0,4
Other Information	t_d	PD	(µsec)	0,5					
	prr	PRF	(Hz)	1300					
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	3,3					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					0,4	
	Focal Length		FL_x (cm)		-	6,0	-		4,5
			FL_y (cm)		-	1,3	-		1,3
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	385					
Operating Control Conditions	Gate width		(cm)	0,1		0,1		0,1	0,1
	Gate pos		(cm)	0,0		3,2		3,2	1,6
	B-Imagesector angle		(Degree)	1,3		4,4		3,3	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: 11L-D **Operating Mode:** Pulsed Doppler

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \le 1$	$A_{aprt} > 1$			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	5,3	-	6,9	-	-	5,2	
Output Power	P	(mW)			48	-		43	44
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				-		7,6	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				-		458	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		307	
pulse intensity integral	I_{pi}	(mWs/cm²)	0,29					0,14	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,20					0,09	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,3						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,9						
-12 dB output beam area	A_{aprt}	(cm²)			0,4	-			0,3
Equivalent aperture diameter	D_{eq}	(cm)				-			0,6
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						1,0	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1,1						

A-1-34 Tables for 11L-D at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 11L-D **Operating Mode:** Color Flow

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
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)		37	-		-	99
	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)	1,3					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	7,0	6,9	-	-	-	5,9
	Dim of A_{aprt}		X (cm)		1,3	-	-	-	4,0
			Y (cm)		0,4	-	-	-	0,4
Other Information	t_d	PD	(µsec)	0,7					
	prr	PRF	(Hz)	4060					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	4,3					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		3,2	-	-		0,9
			FL_y (cm)		1,3	-	-		1,3
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	404					
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			1	1				1
	Frequency Setting			norm	norm				norm
	SENS PRI			-	-				-
	B Tx Power		(%)	1	1				1
	CFM Box start		(cm)	0,8	2,0				0,3
	CFM Box end		(cm)	2,0	3,2				1,5
	CFM Box width		(cm)	3,7	0,6				3,7
	CFM Tx power		(%)	100	100				100
	Ensemble			22,0	7,0				7,0
	Line Density			1	1				1
	Flow Res			low	high				high
	Velocity Range		(kHz)	0,1	0,1				15,5
	CFM Quality			low	low				low
	CFM Frequency			high	high				mid

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 11L-D **Operating Mode:** Color Flow

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	7,0	6,9	-	-	6,9	-	
Output Power	P	(mW)			-	-		-	99
Bounded output Power	P_1	(mW)		28			28		
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)	0,77					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,41					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	4,3						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3,2						
-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)	1,3						

A-1-35 Tables for PA6-8-D at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: PA6-8-D **Operating Mode:** B-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1	A_{aprt}>1		
Global Maximum Index Value				1,2	0,6	-	-	-	0,8
	IEC	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3,0					
	P	W_o	(mW)		27	-		-	27
	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)	2,2					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	5,8	4,8	-	-	-	4,8
	Dim of A_{aprt}		X (cm)		1,0	-	-	-	1,0
			Y (cm)		0,6	-	-	-	0,6
	t_d	PD	(µsec)	0,3					
	prr	PRF	(Hz)	2490					
	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)		8,0	-	-		8,0
			FL_y (cm)		3,7	-	-		3,7
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	259					
	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	13,7	13,7				13,7
	B-Imagesector angle		(Degree)	20,0	20,0				20,0
	Quality			low	low				low
Operating	Zoom			1,0	1,0				1,0
Control	Foc. Zones			1	1				1
Conditions	Frequency Setting			resol	Mid				Mid
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	ZoomBox start		(cm)	6,9	3,2				3,2
	ZoomBox end		(cm)	9,6	5,9				5,9
	ZoomBox angle		(Degree)	15,0	17,5				17,5
	Mode Type			B	B(Harm)				B(Harm)
	Focal Depth		(cm)	3,5	8,0				8,0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: PA6-8-D **Operating Mode:** B-Mode

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1	A_{aprt}>1			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	5,8	4,8	-	-	4,8	-	
Output Power	P	(mW)			-	-		-	27
Bounded output Power	P_1	(mW)		27			27		
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)	0,07					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	4,5						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3,0						
-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)	2,2						

A-1-36 Tables for PA6-8-D at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: PA6-8-D **Operating Mode:** B+M Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt}\le1$ cm²	$A_{aprt}>1$ cm²		
Global Maximum Index Value				1,2	0,6	-	-	-	0,7
	IEC	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,7					
	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)				-		
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)	1,9					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	5,2	4,8	-	-	-	4,8
	Dim of A_{aprt}		X (cm)		1,0	-	-	-	1,0
			Y (cm)		0,6	-	-	-	0,6
	t_d	PD	(µsec)	0,3					
	prr	PRF	(Hz)	450					
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	3,4					
Other	d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)					-	
Information	Focal Length		FL_x (cm)		8,0	-	-		8,0
			FL_y (cm)		3,7	-	-		3,7
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	197					
	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	13,7	13,7				13,7
	B-Imagesector angle		(Degree)	90,0	90,0				90,0
	Quality			low	low				low
Operating	Zoom			1,0	1,0				1,0
Control	Foc. Zones			1	1				1
Conditions	Frequency Setting			resol	norm				norm
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	Mode Type			M(Harm)	M(Harm)				M(Harm)
	Focal Depth		(cm)	3,0	8,0				8,0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: PA6-8-D **Operating Mode:** B+M Mode

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt}\le1$ cm²	$A_{aprt}>1$ cm²			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	5,2	4,8	-	-	4,8	-	
Output Power	P	(mW)			-	-		-	26
Bounded output Power	P_1	(mW)		26			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)	0,13					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,06					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,4						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,7						
-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)	1,9						

A-1-37 Tables for PA6-8-D at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: PA6-8-D **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt}\le1$	$A_{aprt}>1$		
Global Maximum Index Value				1,1	-	1,0	-	0,9	1,1
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,1					
	P	W_o	(mW)		-	34		33	34
	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)					0,3	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	1,9					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,8	
	f_{awf}	f_c	(MHz)	3,9	-	6,1	-	5,8	6,1
	Dim of A_{aprt}		X (cm)		-	0,8	-	0,8	0,8
			Y (cm)		-	0,6	-	0,6	0,6
Other Information	t_d	PD	(µsec)	0,8					
	prr	PRF	(Hz)	1300					
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	2,7					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					0,5	
	Focal Length		FL_x (cm)		-	10,0	-		10,0
			FL_y (cm)		-	3,7	-		3,7
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	113					
Operating Control Conditions	Gate width		(cm)	0,1		0,3		0,2	0,3
	Gate pos		(cm)	0,0		4,2		9,6	4,2
	B-Imagesector angle		(Degree)	1,3		3,3		5,5	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: PA6-8-D **Operating Mode:** Pulsed Doppler

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt}\le1$	$A_{aprt}>1$			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	3,9	-	6,1	-	-	5,8	
Output Power	P	(mW)			34	-		33	34
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				-		3,8	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				-		273	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		127	
pulse intensity integral	I_{pi}	(mWs/cm²)	0,15					0,05	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,09					0,02	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2,7						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,1						
-12 dB output beam area	A_{aprt}	(cm²)			0,5	-			0,5
Equivalent aperture diameter	D_{eq}	(cm)				-			0,8
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						0,3	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1,9						

A-1-38 Tables for PA6-8-D at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: PA6-8-D **Operating Mode:** Color Flow

Index Label				MI	TIS scan	TIS non-scan $A_{aprt}\leq1$	TIS non-scan $A_{aprt}>1$	TIB non-scan	TIC
Global Maximum Index Value				1,2	1,4	-	-	-	1,4
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,4					
	P	W_o	(mW)		49	-		-	49
	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)	2,2					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	3,9	6,1	-	-	-	6,1
	Dim of A_{aprt}		X (cm)		1,0	-	-	-	1,0
			Y (cm)		0,6	-	-	-	0,6
Other Information	t_d	PD	(µsec)	0,8					
	prr	PRF	(Hz)	960					
	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)		10,0	-	-		10,0
			FL_y (cm)		3,7	-	-		3,7
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	177					
Operating Control Conditions	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	13,7	13,7				13,7
	B-Imagesector angle		(Degree)	90,0	20,0				20,0
	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)	2,4	7,8				7,8
	CFM Box end		(cm)	4,5	9,8				9,8
	CFM Box angle		(Degree)	90,0	12,0				12,0
	CFM Tx power		(%)	100	100				100
	Ensemble			22,0	9,0				9,0
	Line Density			1	10				10
	Flow Res			high	high				high
	Velocity Range		(kHz)	0,1	5,0				5,0
	CFM Quality			low	high				high
	CFM Frequency			low	high				high

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: PA6-8-D **Operating Mode:** Color Flow

Index			MI	TIS Scanning	TIS Non-Scanning $A_{aprt}\leq1$	TIS Non-Scanning $A_{aprt}>1$	TIB Scanning	TIB Non-Scanning	TIC
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	3,9	6,1	-	-	6,1	-	
Output Power	P	(mW)			-	-		-	49
Bounded output Power	P_1	(mW)		48			48		
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)	0,25					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,14					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,3						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,4						
-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)	2,2						

A-1-39 Tables for PA6-8-D at Color/Motion Mode (CM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: PA6-8-D **Operating Mode:** cM-Mode

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	1,2	-	-	-	1,2
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3,0					
	P	W_o	(mW)		41	-		-	41
	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)	0,6					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	5,8	6,1	-	-	-	6,1
	Dim of A_{aprt}		X (cm)		1,0	-	-	-	1,0
			Y (cm)		0,6	-	-	-	0,6
Other Information	t_d	PD	(µsec)	0,8					
	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)		10,0	-	-		10,0
			FL_y (cm)		3,7	-	-		3,7
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	329					
Operating Control Conditions	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	13,7	13,7				13,7
	B-Imagesector angle		(Degree)	20	90				90
	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	16				16
	Flow Res			high	high				high
	Velocity Range		(kHz)	0,1	0,9				0,9
	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: PA6-8-D **Operating Mode:** cM-Mode

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	6,1	-	-	5,8	-	
Output Power	P	(mW)			-	-		-	41
Bounded output Power	P_1	(mW)		41			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)	0,41					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,32					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,3						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3,0						
-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)	0,6						

A-1-40 Tables for PA6-8-D at Continuous Wave Doppler (CW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: PA6-8-D **Operating Mode:** Continuous Wave

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1$ cm²	$A_{aprt} > 1$ cm²		
Global Maximum Index Value				0,0	-	0,2	-	1,1	0,8
	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	0,1					
	P	W_o	(mW)		-	11		11	11
	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)					0,4	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	0,4					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,2	
	f_{awf}	f_c	(MHz)	4,2	-	4,2	-	4,2	4,2
	Dim of A_{aprt}	X	(cm)		-	0,2	-	0,2	0,2
		Y	(cm)		-	0,6	-	0,6	0,6
	t_d	PD	(μsec)	2,1					
	prr	PRF	(Hz)	-					
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	0,1					
Other	d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)					0,2	
Information	Focal Length	FL_x	(cm)		-	5,0	-		5,0
		FL_y	(cm)		-	3,7	-		3,7
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	0					
	Velocity Range		(kHz)	10,1		10,1		10,1	10,1
Operating	Power		(%)	100,0		100,0		100,0	100,0
Control									
Conditions									

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: PA6-8-D **Operating Mode:** Continuous Wave

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)	4,2	-	4,2	-	-	4,2	
Output Power	P	(mW)			11	-		11	11
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				-		10,3	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				-		296	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		263	
pulse intensity integral	I_{pi}	(mWs/cm²)	-					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	-					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	0,1						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	0,1						
-12 dB output beam area	A_{aprt}	(cm²)			0,1	-			0,1
Equivalent aperture diameter	D_{eq}	(cm)				-			0,4
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						0,4	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	0,4						

A-1-41 Tables for 3S-D at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 3S-D **Operating Mode:** B-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt}\le1$	$A_{aprt}>1$		
Global Maximum	Index Value			1,3	0,8	-	-	-	1,7
	IEC	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	1,8					
	P	W_o	(mW)		71	-		-	115
	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)	5,8					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2,1	2,5	-	-	-	2,3
	Dim of A_{aprt}	X	(cm)		1,0	-	-	-	1,9
		Y	(cm)		1,2	-	-	-	1,2
	t_d	PD	(µsec)	0,6					
	prr	PRF	(Hz)	1280					
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	2,7					
Other	d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)					-	
Information	Focal Length	FL_x	(cm)		7,0	-	-		14,0
		FL_y	(cm)		4,8	-	-		4,8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	146					
	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	23,7	23,7				23,7
	B-Imagesector angle		(Degree)	20,0	20,0				20,0
	Quality			low	high				low
Operating	Zoom			1,0	1,0				1,0
Control	Foc. Zones			1	1				1
Conditions	Frequency Setting			High	resol				norm
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	ZoomBox start		(cm)	11,1	3,2				12,6
	ZoomBox end		(cm)	15,8	7,9				17,4
	ZoomBox angle		(Degree)	15,0	15,0				17,5
	Mode Type			B(Harm)	B				B
	Focal Depth		(cm)	11,0	7,0				14,0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 3S-D **Operating Mode:** B-Mode

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt}\le1$	$A_{aprt}>1$			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	2,1	2,5	-	-	2,5	-	
Output Power	P	(mW)			-	-		-	115
Bounded output Power	P_1	(mW)		68			68		
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)	0,09					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2,7						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	1,8						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			2,1
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)	5,8						

A-1-42 Tables for 3S-D at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 3S-D **Operating Mode:** B+M Mode

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	0,5	-	-	-	1,7
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	1,8					
	P	W_o	(mW)		47	-		-	114
	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)	2,1	2,4	-	-	-	2,3
	Dim of A_{aprt}		X (cm)		0,8	-	-	-	1,9
			Y (cm)		1,2	-	-	-	1,2
Other Information	t_d	PD	(µsec)	0,6					
	prr	PRF	(Hz)	450					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2,7					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		5,0	-	-		14,0
			FL_y (cm)		4,8	-	-		4,8
	$I_{pa,\alpha}$ 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)	23,7	23,7				23,7
	B-Imagesector angle		(Degree)	90,0	90,0				90,0
	Quality			low	low				low
	Zoom			1,0	1,0				1,0
	Foc. Zones			1	1				1
	Frequency Setting			resol	norm				norm
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	Mode Type			M(Harm)	M				M
	Focal Depth		(cm)	11,0	5,0				14,0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 3S-D **Operating Mode:** B+M Mode

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	2,4	-	-	1,9	-	
Output Power	P	(mW)			-	-		-	114
Bounded output Power	P_1	(mW)		47			153		
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)	0,09					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2,7						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	1,8						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			2,1
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)	5,8						

A-1-43 Tables for 3S-D at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 3S-D **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt}\le1$	$A_{aprt}>1$		
Global Maximum	Index Value			1,3	-	-	0,8	1,7	1,7
	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	1,8					
	P	W_o	(mW)		-	-		45	101
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				61,5		
Assoc.	z_s	z_1	(cm)				2,6		
Acoustic	z_{bp}	z_{bp}	(cm)				2,2		
Parameter	z_b	z_{sp}	(cm)					3,6	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	5,0					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,4	
	f_{awf}	f_c	(MHz)	2,1	-	-	2,7	1,9	2,7
	Dim of A_{aprt}		X (cm)		-	-	1,5	0,9	1,5
			Y (cm)		-	-	1,2	1,2	1,2
	t_d	PD	(µsec)	0,7					
	prr	PRF	(Hz)	1300					
	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)					0,4	
Information	Focal Length		FL_x (cm)		-	-	14,0		14,0
			FL_y (cm)		-	-	4,8		4,8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	142					
	Gate width		(cm)	0,1			0,3	0,4	0,3
Operating	Gate pos		(cm)	7,1			16,5	2,5	16,5
Control	Velocity Range		(kHz)	1,3			3,3	4,4	3,3
Conditions	Power		(%)	100			100	100	100

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 3S-D **Operating Mode:** Pulsed Doppler

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt}\le1$	$A_{aprt}>1$			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	2,1	-	-	2,7	-	1,9	
Output Power	P	(mW)			-	101		45	101
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				62		27,9	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				548		307	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				185		198	
pulse intensity integral	I_{pi}	(mWs/cm²)	0,21					0,07	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,10					0,04	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2,5						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	1,8						
-12 dB output beam area	A_{aprt}	(cm²)			-	1,7			1,7
Equivalent aperture diameter	D_{eq}	(cm)				1,5			1,5
Depth for *TIS*	z_s	(cm)				2,6			
Depth for *TIB*	z_b	(cm)						3,6	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	5,0						

A-1-44 Tables for 3S-D at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 3S-D **Operating Mode:** Color Flow

Index Label				MI	TIS scan	TIS non-scan $A_{aprt} \le 1$	TIS non-scan $A_{aprt} > 1$	TIB non-scan	TIC
Global Maximum Index Value				1,3	1,0	-	-	-	1,7
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	1,7					
	P	W_o	(mW)		74	-		-	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)	1,2					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	1,9	2,7	-	-	-	2,3
	Dim of A_{aprt}	X	(cm)		1,0	-	-	-	1,5
		Y	(cm)		1,2	-	-	-	1,2
Other Information	t_d	PD	(µsec)	1,4					
	prr	PRF	(Hz)	930					
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	1,5					
	d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)					-	
	Focal Length	FL_x	(cm)		5,0	-	-		8,0
		FL_y	(cm)		4,8	-	-		4,8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	82					
Operating Control Conditions	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	23,7	23,7				23,7
	B-Imagesector angle		(Degree)	90,0	20,0				90,0
	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)	0,0	2,5				5,0
	CFM Box end		(cm)	3,6	6,1				8,6
	CFM Box angle		(Degree)	90,0	12,0				90,0
	CFM Tx power		(%)	100	100				100
	Ensemble			22,0	22,0				31,0
	Line Density			1	10				1
	Flow Res			high	low				high
	Velocity Range		(kHz)	0,1	7,5				6,0
	CFM Quality			low	low				norm
	CFM Frequency			low	high				mid

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 3S-D **Operating Mode:** Color Flow

Index			MI	TIS Scanning	TIS Non-Scanning $A_{aprt} \le 1$	TIS Non-Scanning $A_{aprt} > 1$	TIB Scanning	TIB Non-Scanning	TIC
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	1,9	2,7	-	-	2,7	-	
Output Power	P	(mW)			-	-		-	101
Bounded output Power	P_1	(mW)		74			74		
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)	0,14					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,11					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	1,5						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	1,7						
-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)	1,2						

A-1-45 Tables for 3S-D at Color/Motion Mode (CM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 3S-D **Operating Mode:** cM-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			1,3	0,8	-	-	-	1,7
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	1,7					
	P	W_o	(mW)		98	-		-	112
	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)	1,9	2,7	-	-	-	2,7
	Dim of A_{aprt}		X (cm)		1,5	-	-	-	1,9
			Y (cm)		1,2	-	-	-	1,2
Other Information	t_d	PD	(µsec)	1,4					
	prr	PRF	(Hz)	150					
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	1,5					
	d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		8,0	-	-		14,0
			FL_y (cm)		4,8	-	-		4,8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	82					
Operating Control Conditions	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	23,7	23,7				23,7
	B-Imagesector angle		(Degree)	20	20				90
	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				8
	Flow Res			high	high				high
	Velocity Range		(kHz)	0,1	1,8				1,3
	Speed			6,0	6,0				6,0
	Mc Frequency			Low	High				High

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 3S-D **Operating Mode:** cM-Mode

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)	1,9	2,7	-	-	2,3	-	
Output Power	P	(mW)			-	-		-	112
Bounded output Power	P_1	(mW)		65			156		
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)	0,14					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,11					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	1,5						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	1,7						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			2,1
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)	1,2						

A-1-46 Tables for 3S-D at Continuous Wave Doppler (CW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: 3S-D **Operating Mode:** Continuous Wave

Index Label				MI	TIS scan	TIS non-scan $A_{aprt} \le 1$	TIS non-scan $A_{aprt} > 1$	TIB non-scan	TIC
Global Maximum Index Value				0,1	-	0,5	-	1,7	1,5
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	0,1					
	P	W_o	(mW)		-	49		49	49
	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)					1,7	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	1,7					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,5	
	f_{awf}	f_c	(MHz)	2,1	-	2,1	-	2,1	2,1
	Dim of A_{aprt}		X (cm)		-	0,5	-	0,5	0,5
			Y (cm)		-	1,2	-	1,2	1,2
Other Information	t_d	PD	(µsec)	5,0					
	prr	PRF	(Hz)	-					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	0,1					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					0,5	
	Focal Length		FL_x (cm)		-	8,0	-		8,0
			FL_y (cm)		-	4,8	-		4,8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	0					
Operating Control Conditions	Velocity Range		(kHz)	10,0		10,0		10,0	10,0
	Power		(%)	100,0		100,0		100,0	100,0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: 3S-D **Operating Mode:** Continuous Wave

Index			MI	TIS Scanning	TIS Non-Scanning $A_{aprt} \le 1$	TIS Non-Scanning $A_{aprt} > 1$	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	-	2,1	-	-	2,1	
Output Power	P	(mW)			49	-		49	49
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				-		38,0	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				-		244	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		196	
pulse intensity integral	I_{pi}	(mWs/cm²)	-					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	-					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	0,1						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	0,1						
-12 dB output beam area	A_{aprt}	(cm²)			0,5	-			0,5
Equivalent aperture diameter	D_{eq}	(cm)				-			0,8
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						1,7	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1,7						

A-1-47 Tables for RAB2-5-D at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RAB2-5-D **Operating Mode:** B-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt}\le1$	$A_{aprt}>1$		
Global Maximum Index Value				1,2	0,4	-	-	-	1,5
	IEC	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,0					
	P	W_o	(mW)		72	-		-	228
	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)	3,8					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2,6	3,1	-	-	-	2,3
	Dim of A_{aprt}		X (cm)		2,7	-	-	-	8,6
			Y (cm)		1,3	-	-	-	1,3
	t_d	PD	(µsec)	0,5					
	prr	PRF	(Hz)	4730					
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	2,6					
Other	d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)					-	
Information	Focal Length		FL_x (cm)		9,0	-	-		15,0
			FL_y (cm)		7,8	-	-		7,8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	147					
	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	30,0	5,0				5,0
	B-Imagesector angle		(Degree)	80,0	20,0				80,0
	Quality			low	low				low
Operating	Zoom			1,0	1,0				1,0
Control	Foc. Zones			1	1				1
Conditions	Frequency Setting			penet	-				-
	SENS PRI			-	15,0				1,0
	Power		(%)	100	100				100
	ZoomBox start		(cm)	5,0	1,2				0,4
	ZoomBox end		(cm)	11,0	3,7				2,9
	ZoomBox angle		(Degree)	80,0	15,0				80,0
	Mode Type			B	BFlow				BFlow
	Focal Depth		(cm)	5,0	9,0				15,0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RAB2-5-D **Operating Mode:** B-Mode

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt}\le1$	$A_{aprt}>1$			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	2,6	3,1	-	-	3,1	-	
Output Power	P	(mW)			-	-		-	228
Bounded output Power	P_1	(mW)		26			26		
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)	0,07					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2,6						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,0						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			11,2
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)	3,8						

A-1-48 Tables for RAB2-5-D at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RAB2-5-D **Operating Mode:** B+M Mode

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	-	-	-	1,0
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	1,8					
	P	W_o	(mW)		44	-		-	92
	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)	6,1					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2,1	2,8	-	-	-	2,1
	Dim of A_{aprt}		X (cm)		0,6	-	-	-	1,9
			Y (cm)		1,3	-	-	-	1,3
Other Information	t_d	PD	(µsec)	1,1					
	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)		3,5	-	-		11,0
			FL_y (cm)		7,8	-	-		7,8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	135					
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)	80,0	80,0				80,0
	Quality			low	low				low
	Zoom			1,0	1,0				1,0
	Foc. Zones			1	1				1
	Frequency Setting			norm	penet				norm
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	Mode Type			M(Harm)	M				M(Harm)
	Focal Depth		(cm)	11,0	3,5				11,0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RAB2-5-D **Operating Mode:** B+M Mode

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)			-	-		-	92
Bounded output Power	P_1	(mW)		27			117		
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)	0,37					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,14					-	
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)			-	-			2,4
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)	6,1						

A-1-49 Tables for RAB2-5-D at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RAB2-5-D **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				1,2	-	-	0,9	1,7	1,7
	IEC	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	1,8					
	P	W_o	(mW)		-	-		99	113
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				59,4		
Assoc.	z_s	z_1	(cm)				2,2		
Acoustic	z_{bp}	z_{bp}	(cm)				2,2		
Parameter	z_b	z_{sp}	(cm)					5,1	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	4,7					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,6	
	f_{awf}	f_c	(MHz)	2,3	-	-	3,1	2,3	2,8
	Dim of A_{aprt}		X (cm)		-	-	1,2	1,6	1,6
			Y (cm)		-	-	1,3	1,3	1,3
	t_d	PD	(µsec)	0,8					
	prr	PRF	(Hz)	1300					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2,6					
Other	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					0,6	
Information	Focal Length		FL_x (cm)		-	-	12,0		15,0
			FL_y (cm)		-	-	7,8		7,8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	162					
	Gate width		(cm)	0,1			0,3	0,1	0,5
Operating	Gate pos		(cm)	6,0			6,1	9,0	9,1
Control	B-Imagesector angle		(Degree)	1,3			2,2	2,2	3,3
Conditions	Power		(%)	100			100	100	100

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RAB2-5-D **Operating Mode:** Pulsed Doppler

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	2,3	-	-	3,1	-	2,3	
Output Power	P	(mW)			-	95		99	113
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				59		7,6	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				604		460	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				210		189	
pulse intensity integral	I_{pi}	(mWs/cm²)	0,26					0,21	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,12					0,09	
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)			-	1,6			2,1
Equivalent aperture diameter	D_{eq}	(cm)				1,4			1,6
Depth for *TIS*	z_s	(cm)				2,2			
Depth for *TIB*	z_b	(cm)						5,1	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	4,7						

A-1-50 Tables for RAB2-5-D at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RAB2-5-D **Operating Mode:** Color Flow

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt}\leq1$	$A_{aprt}>1$		
Global Maximum Index Value				1,3	0,6	-	-	-	1,7
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,2					
	P	W_o	(mW)		45	-		-	227
	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)	1,3					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	3,1	2,9	-	-	-	2,9
	Dim of A_{aprt}		X (cm)		1,0	-	-	-	6,5
			Y (cm)		1,3	-	-	-	1,3
Other Information	t_d	PD	(µsec)	0,8					
	prr	PRF	(Hz)	2400					
	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)		3,0	-	-		5,0
			FL_y (cm)		7,8	-	-		7,8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	207					
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)	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			norm	norm				norm
	SENS PRI			-	-				-
	B Tx Power		(%)	1	1				1
	CFM Box start		(cm)	1,1	1,1				2,1
	CFM Box end		(cm)	5,6	5,6				6,6
	CFM Box angle		(Degree)	80,0	7,6				80,0
	CFM Tx power		(%)	100	100				100
	Ensemble			7,0	7,0				9,0
	Line Density			1	1				2
	Flow Res			high	low				low
	Velocity Range		(kHz)	9	9,0				0,1
	CFM Quality			low	low				high
	CFM Frequency			high	mid				mid

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RAB2-5-D **Operating Mode:** Color Flow

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt}\leq1$	$A_{aprt}>1$			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	3,1	2,9	-	-	2,9	-	
Output Power	P	(mW)			-	-		-	227
Bounded output Power	P_1	(mW)		43			43		
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)	0,17					-	
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)			-	-			8,4
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)	1,3						

A-1-51 Tables for RAB2-5-D at Color/Motion Mode (CM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RAB2-5-D **Operating Mode:** cM-Mode

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
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,2					
	P	W_o	(mW)		106	-		-	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)	1,3					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	3,1	3,0	-	-	-	3,0
	Dim of A_{aprt}		X (cm)		1,4	-	-	-	1,4
			Y (cm)		1,3	-	-	-	1,3
Other Information	t_d	PD	(μsec)	0,8					
	prr	PRF	(Hz)	150					
	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)		9,0	-	-		9,0
			FL_y (cm)		7,8	-	-		7,8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	207					
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	80				80
	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		(%)	97	1				1
	Mc Tx Power		(%)	100	100				100
	Ensemble			16	16				16
	Flow Res			high	high				high
	Velocity Range		(kHz)	0,1	1,3				1,3
	Speed			6,0	6,0				6,0
	Mc Frequency			High	High				High

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RAB2-5-D **Operating Mode:** cM-Mode

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)	3,1	3,0	-	-	2,2	-	
Output Power	P	(mW)			-	-		-	106
Bounded output Power	P_1	(mW)		66			162		
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)	0,17					-	
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)			-	-			1,9
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)	1,3						

A-1-52 Tables for RAB4-8-D at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RAB4-8-D **Operating Mode:** B-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1$	$A_{aprt} > 1$		
Global Maximum Index Value				1,3	0,3	-	-	-	0,9
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,3					
	P	W_o	(mW)		88	-		-	114
	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)	1,9					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	3,2	4,2	-	-	-	3,3
	Dim of A_{aprt}		X (cm)		5,9	-	-	-	7,6
			Y (cm)		1,1	-	-	-	1,1
Other Information	t_d	PD	(µsec)	0,4					
	prr	PRF	(Hz)	4290					
	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)		3,0	-	-		11,0
			FL_y (cm)		6,3	-	-		6,3
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	191					
Operating Control Conditions	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	26,0	3,0				26,0
	B-Imagesector angle		(Degree)	70,0	70,0				70,0
	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)	7,8	0,0				19,9
	ZoomBox end		(cm)	13,0	2,0				25,1
	ZoomBox angle		(Degree)	70,0	70,0				70,0
	Mode Type			B	B(CE)				B(CE)
	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-D **Operating Mode:** B-Mode

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning $A_{aprt} \le 1$	Non-Scanning $A_{aprt} > 1$	Scanning	Non-Scanning	
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	3,2	4,2	-	-	4,2	-	
Output Power	P	(mW)			-	-		-	114
Bounded output Power	P_1	(mW)		15			15		
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)	0,07					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2,5						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,3						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			8,4
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)	1,9						

A-1-53 Tables for RAB4-8-D at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RAB4-8-D **Operating Mode:** B+M Mode

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	0,2	-	-	-	0,7
	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,2					
	P	W_o	(mW)		51	-		-	55
	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)	0,6					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	3,0	3,1	-	-	-	2,7
	Dim of A_{aprt}		X (cm)		2,0	-	-	-	2,0
			Y (cm)		1,1	-	-	-	1,1
	t_d	PD	(µsec)	0,5					
	prr	PRF	(Hz)	900					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	1,8					
Other	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
Information	Focal Length		FL_x (cm)		12,0	-	-		11,0
			FL_y (cm)		6,3	-	-		6,3
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	134					
	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
Operating	Zoom			1,0	1,0				1,0
Control	Foc. Zones			1	1				1
Conditions	Frequency Setting			penet	norm				penet
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	Mode Type			M	M				M(Harm)
	Focal Depth		(cm)	1,5	12,0				11,0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RAB4-8-D **Operating Mode:** B+M Mode

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning A_{aprt}≤1 cm²	Non-Scanning A_{aprt}>1 cm²	Scanning	Non-Scanning	
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	3,0	3,1	-	-	2,7	-	
Output Power	P	(mW)			-	-		-	55
Bounded output Power	P_1	(mW)		16			60		
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)	1,8						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,2						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			2,2
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)	0,6						

A-1-54 Tables for RAB4-8-D at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RAB4-8-D **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt}\le1$	$A_{aprt}>1$		
Global Maximum Index Value				1,0	-	-	0,6	1,1	1,0
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	1,9					
	P	W_o	(mW)		-	-		39	54
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				31,4		
	z_s	z_1	(cm)				2,0		
	z_{bp}	z_{bp}	(cm)				2,0		
	z_b	z_{sp}	(cm)					3,4	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	3,1					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,3	
	f_{awf}	f_c	(MHz)	3,2	-	-	3,8	3,8	3,8
	Dim of A_{aprt}		X (cm)		-	-	1,3	1,0	1,3
			Y (cm)		-	-	1,1	1,1	1,1
Other Information	t_d	PD	(µsec)	0,9					
	prr	PRF	(Hz)	1300					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2,2					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					0,3	
	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)	103					
Operating Control Conditions	Gate width		(cm)	0,1			0,4	0,1	0,4
	Gate pos		(cm)	2,6			5,3	5,2	5,3
	B-Imagesector angle		(Degree)	1,3			2,2	2,2	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: RAB4-8-D **Operating Mode:** Pulsed Doppler

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt}\le1$	$A_{aprt}>1$			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	3,2	-	-	3,8	-	3,8	
Output Power	P	(mW)			-	54		39	54
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				31		4,7	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				534		413	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				160		155	
pulse intensity integral	I_{pi}	(mWs/cm²)	0,19					0,19	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,09					0,07	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2,2						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	1,9						
-12 dB output beam area	A_{aprt}	(cm²)			-	1,4			1,4
Equivalent aperture diameter	D_{eq}	(cm)				1,3			1,3
Depth for *TIS*	z_s	(cm)				2,0			
Depth for *TIB*	z_b	(cm)						3,4	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	3,1						

A-1-55 Tables for RAB4-8-D at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RAB4-8-D **Operating Mode:** Color Flow

Index Label				MI	TIS scan	TIS non-scan $A_{aprt}\le1$	TIS non-scan $A_{aprt}>1$	TIB non-scan	TIC
Global Maximum Index Value				1,3	0,3	-	-	-	0,8
	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,3					
	P	W_o	(mW)		80	-		-	105
	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)	0,5					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	3,4	3,9	-	-	-	3,4
	Dim of A_{aprt}		X (cm)		5,4	-	-	-	6,8
			Y (cm)		1,1	-	-	-	1,1
	t_d	PD	(µsec)	0,8					
	prr	PRF	(Hz)	2660					
	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)		1,5	-	-		11,0
			FL_y (cm)		6,3	-	-		6,3
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	189					
	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
Operating	Frequency Setting			norm	norm				norm
Control	SENS PRI			-	-				-
Conditions	B Tx Power		(%)	1	1				1
	CFM Box start		(cm)	0,0	0,0				8,3
	CFM Box end		(cm)	3,9	3,9				12,2
	CFM Box angle		(Degree)	70,0	70,0				70,0
	CFM Tx power		(%)	100	100				100
	Ensemble			7,0	31,0				9,0
	Line Density			1	2				2
	Flow Res			low	high				high
	Velocity Range		(kHz)	11	11,0				5,0
	CFM Quality			low	high				high
	CFM Frequency			mid	high				mid

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RAB4-8-D **Operating Mode:** Color Flow

Index			MI	TIS Scanning	TIS Non-Scanning $A_{aprt}\le1$	TIS Non-Scanning $A_{aprt}>1$	TIB Scanning	TIB Non-Scanning	TIC
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	3,4	3,9	-	-	3,9	-	
Output Power	P	(mW)			-	-		-	105
Bounded output Power	P_1	(mW)		15			15		
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)	0,15					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2,5						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,3						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			7,5
Equivalent aperture diameter	D_{eq}	(cm)				-			3,1
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)	0,5						

A-1-56 Tables for RAB4-8-D at Color/Motion Mode (CM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RAB4-8-D **Operating Mode:** cM-Mode

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	0,6	-	-	-	1,0
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,3					
	P	W_o	(mW)		64	-		-	64
	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)	3,3	3,0	-	-	-	3,0
	Dim of A_{aprt}		X (cm)		1,7	-	-	-	1,7
			Y (cm)		1,1	-	-	-	1,1
Other Information	t_d	PD	(µsec)	0,8					
	prr	PRF	(Hz)	150					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2,4					
	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)	231					
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	70				70
	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				1
	Mc Tx Power		(%)	100	100				100
	Ensemble			16	8				8
	Flow Res			high	high				high
	Velocity Range		(kHz)	0,1	1,8				1,8
	Speed			6,0	6,0				6,0
	Mc Frequency			Mid	Low				Low

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RAB4-8-D **Operating Mode:** cM-Mode

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)	3,3	3,0	-	-	3,0	-	
Output Power	P	(mW)			-	-		-	64
Bounded output Power	P_1	(mW)		39			122		
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)	0,40					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,25					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2,4						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,3						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			1,9
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)	1,2						

A-1-57 Tables for RAB4-8-D at Continuous Wave Doppler (CW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RAB4-8-D **Operating Mode:** Continuous Wave

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1$ cm²	$A_{aprt} > 1$ cm²		
Global Maximum Index Value				0,1	-	0,4	-	1,5	0,9
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	0,1					
	P	W_o	(mW)		-	30		30	30
	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)					1,0	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	2,6					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,4	
	f_{awf}	f_c	(MHz)	2,7	-	2,7	-	2,7	2,7
	Dim of A_{aprt}		X (cm)		-	0,4	-	0,4	0,4
			Y (cm)		-	1,1	-	1,1	1,1
Other Information	t_d	PD	(µsec)	5,1					
	prr	PRF	(Hz)	-					
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	0,1					
	d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)					0,3	
	Focal Length		FL_x (cm)		-	6,0	-		6,0
			FL_y (cm)		-	6,3	-		6,3
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	0					
Operating Control Conditions	Velocity Range		(kHz)	10,1		10,1		10,1	10,1
	Power		(%)	100,0		100,0		100,0	100,0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RAB4-8-D **Operating Mode:** Continuous Wave

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)	2,7	-	2,7	-	-	2,7	
Output Power	P	(mW)			30	-		30	30
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				-		24,4	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				-		492	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		302	
pulse intensity integral	I_{pi}	(mWs/cm²)	-					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	-					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	0,1						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	0,1						
-12 dB output beam area	A_{aprt}	(cm²)			0,5	-			0,5
Equivalent aperture diameter	D_{eq}	(cm)				-			0,8
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						1,0	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	2,6						

A-1-58 Tables for RIC5-9-D at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RIC5-9-D **Operating Mode:** B-Mode

Index Label				MI	TIS scan	TIS non-scan $A_{aprt} \le 1$	TIS non-scan $A_{aprt} > 1$	TIB non-scan	TIC
Global Maximum Index Value				1,1	0,2	-	-	-	0,4
	IEC	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3,0					
	P	W_o	(mW)		11	-		-	31
	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)	0,7					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	6,8	5,0	-	-	-	5,0
	Dim of A_{aprt}		X (cm)		1,5	-	-	-	4,2
			Y (cm)		0,6	-	-	-	0,6
	t_d	PD	(µsec)	0,3					
	prr	PRF	(Hz)	3540					
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	3,4					
Other	d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)					-	
Information	Focal Length		FL_x (cm)		6,0	-	-		8,0
			FL_y (cm)		3,5	-	-		3,5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	375					
	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			low	high				low
Operating	Zoom			1,0	1,0				1,0
Control	Foc. Zones			1	1				1
Conditions	Frequency Setting			resol	-				-
	SENS PRI			-	15,0				1,0
	Power		(%)	100	100				100
	ZoomBox start		(cm)	10,1	8,0				5,3
	ZoomBox end		(cm)	13,3	11,2				8,5
	ZoomBox angle		(Degree)	146,3	20,0				146,3
	Mode Type			B	BFlow				BFlow
	Focal Depth		(cm)	1,0	6,0				8,0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RIC5-9-D **Operating Mode:** B-Mode

Index			MI	TIS Scanning	TIS Non-Scanning $A_{aprt} \le 1$	TIS Non-Scanning $A_{aprt} > 1$	TIB Scanning	TIB Non-Scanning	TIC
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	6,8	5,0	-	-	5,0	-	
Output Power	P	(mW)			-	-		-	31
Bounded output Power	P_1	(mW)		8			8		
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)	0,15					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,11					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,4						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3,0						
-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)	0,7						

A-1-59 Tables for RIC5-9-D at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RIC5-9-D **Operating Mode:** B+M Mode

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			1,2	0,2	-	-	-	0,4
	IEC	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,7					
	P	W_o	(mW)		20	-		-	20
	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)	1,9					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	4,6	4,4	-	-	-	4,4
	Dim of A_{aprt}		X (cm)		1,2	-	-	-	1,2
			Y (cm)		0,6	-	-	-	0,6
	t_d	PD	(µsec)	0,3					
	prr	PRF	(Hz)	450					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3,5					
Other	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
Information	Focal Length		FL_x (cm)		6,0	-	-		6,0
			FL_y (cm)		3,5	-	-		3,5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	311					
	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
Operating	Zoom			1,0	1,0				1,0
Control	Foc. Zones			1	1				1
Conditions	Frequency Setting			resol	norm				norm
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	Mode Type			M(Harm)	M(Harm)				M(Harm)
	Focal Depth		(cm)	3,0	6,0				6,0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RIC5-9-D **Operating Mode:** B+M Mode

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)	4,6	4,4	-	-	4,3	-	
Output Power	P	(mW)			-	-		-	20
Bounded output Power	P_1	(mW)		9			17		
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)	0,09					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,5						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,7						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			0,7
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)	1,9						

A-1-60 Tables for RIC5-9-D at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RIC5-9-D **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1$	$A_{aprt} > 1$		
Global Maximum Index Value				1,2	-	0,5	-	0,9	0,6
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,8					
	P	W_o	(mW)		-	20		20	20
	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)					1,6	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	1,5					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,3	
	f_{awf}	f_c	(MHz)	5,2	-	5,0	-	5,0	5,0
	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)	1300					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3,6					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					0,3	
	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)	260					
Operating Control Conditions	Gate width		(cm)	0,1		0,4		0,4	0,4
	Gate pos		(cm)	0,0		12,7		12,7	12,7
	B-Imagesector angle		(Degree)	1,3		4,4		4,4	4,4
	Power		(%)	100		100		100	100

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RIC5-9-D **Operating Mode:** Pulsed Doppler

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \le 1$	$A_{aprt} > 1$			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	5,2	-	5,0	-	-	5,0	
Output Power	P	(mW)			20	-		20	20
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				-		4,0	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				-		275	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		155	
pulse intensity integral	I_{pi}	(mWs/cm²)	0,20					0,06	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,11					0,04	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,6						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,8						
-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)						1,6	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1,5						

A-1-61 Tables for RIC5-9-D at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RIC5-9-D **Operating Mode:** Color Flow

Index Label				MI	TIS scan	TIS non-scan $A_{aprt}\le1$	TIS non-scan $A_{aprt}>1$	TIB non-scan	TIC
Global Maximum Index Value				1,3	0,2	-	-	-	0,5
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,8					
	P	W_o	(mW)		33	-		-	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)					-	
	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	5,5	-	-	-	5,5
	Dim of A_{aprt}		X (cm)		4,3	-	-	-	4,3
			Y (cm)		0,6	-	-	-	0,6
Other Information	t_d	PD	(µsec)	0,9					
	prr	PRF	(Hz)	1880					
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	3,2					
	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)	339					
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			resol	resol				resol
	SENS PRI			-	-				-
	B Tx Power		(%)	1	1				1
	CFM Box start		(cm)	0,0	10,2				10,2
	CFM Box end		(cm)	2,4	12,6				12,6
	CFM Box angle		(Degree)	146,3	146,3				146,3
	CFM Tx power		(%)	100	100				100
	Ensemble			22,0	7,0				7,0
	Line Density			1	1				1
	Flow Res			high	high				high
	Velocity Range		(kHz)	0,1	4,0				4,0
	CFM Quality			low	low				low
	CFM Frequency			low	mid				mid

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RIC5-9-D **Operating Mode:** Color Flow

Index			MI	TIS Scanning	TIS Non-Scanning $A_{aprt}\le1$	TIS Non-Scanning $A_{aprt}>1$	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	5,5	-	-	5,5	-	
Output Power	P	(mW)			-	-		-	33
Bounded output Power	P_1	(mW)		8			8		
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)	0,40					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,31					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,2						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,8						
-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)	0,7						

A-1-62 Tables for RIC5-9-D at Color/Motion Mode (CM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RIC5-9-D **Operating Mode:** cM-Mode

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	-	-	-	0,6
	IEC	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,9					
	P	W_o	(mW)		25	-		-	25
	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)	5,4	4,9	-	-	-	4,9
	Dim of A_{aprt}		X (cm)		1,3	-	-	-	1,3
			Y (cm)		0,6	-	-	-	0,6
	t_d	PD	(µsec)	0,5					
	prr	PRF	(Hz)	150					
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	3,8					
Other	d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)					-	
Information	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)	282					
	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	20				20
	B-Quality			low	low				low
	Zoom			1,0	1,0				1,0
	Foc. Zones			1	1				1
Operating	Frequency Setting			resol	resol				resol
Control	SENS PRI			-	-				-
Conditions	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			Mid	Low				Low

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RIC5-9-D **Operating Mode:** cM-Mode

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)	5,4	4,9	-	-	5,1	-	
Output Power	P	(mW)			-	-		-	25
Bounded output Power	P_1	(mW)		25			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)	0,27					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,14					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,8						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,9						
-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)	1,6						

A-1-63 Tables for RIC6-12-D at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RIC6-12-D **Operating Mode:** B-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt}\le1$	$A_{aprt}>1$		
Global Maximum	Index Value			1,3	0,1	-	-	-	0,4
	IEC	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3,0					
	P	W_o	(mW)		7	-		-	20
	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)	5,8	5,9	-	-	-	5,9
	Dim of A_{aprt}		X (cm)		1,4	-	-	-	4,0
			Y (cm)		0,4	-	-	-	0,4
	t_d	PD	(µsec)	0,4					
	prr	PRF	(Hz)	3140					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3,6					
Other	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
Information	Focal Length		FL_x (cm)		5,5	-	-		5,5
			FL_y (cm)		3,0	-	-		3,0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	363					
	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	13,0	2,0				13,0
	B-Imagesector angle		(Degree)	145,8	20,0				145,8
	Quality			low	high				high
Operating	Zoom			1,0	1,0				1,0
Control	Foc. Zones			1	1				1
Conditions	Frequency Setting			Mid	Mid				Mid
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	ZoomBox start		(cm)	0,0	0,0				7,4
	ZoomBox end		(cm)	2,6	1,0				10,0
	ZoomBox angle		(Degree)	145,8	20,0				145,8
	Mode Type			B(Harm)	B(Harm)				B(Harm)
	Focal Depth		(cm)	1,5	5,5				5,5

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RIC6-12-D **Operating Mode:** B-Mode

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt}\le1$	$A_{aprt}>1$			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	5,8	5,9	-	-	5,9	-	
Output Power	P	(mW)			-	-		-	20
Bounded output Power	P_1	(mW)		5			5		
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)	3,6						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3,0						
-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)	0,9						

A-1-64 Tables for RIC6-12-D at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RIC6-12-D **Operating Mode:** B+M Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt}\leq1\ cm^2$	$A_{aprt}>1\ cm^2$		
Global Maximum Index Value				1,2	0,2	-	-	-	0,3
	IEC	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3,0					
	P	W_o	(mW)		14	-		-	14
	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)	6,1	5,8	-	-	-	5,8
	Dim of A_{aprt}		X (cm)		0,8	-	-	-	0,8
			Y (cm)		0,4	-	-	-	0,4
	t_d	PD	(µsec)	0,3					
	prr	PRF	(Hz)	450					
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	3,5					
Other	d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)					-	
Information	Focal Length		FL_x (cm)		4,5	-	-		4,5
			FL_y (cm)		3,0	-	-		3,0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	327					
	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	13,0	13,0				13,0
	B-Imagesector angle		(Degree)	148,7	148,7				148,7
	Quality			low	low				low
Operating	Zoom			1,0	1,0				1,0
Control	Foc. Zones			1	1				1
Conditions	Frequency Setting			resol	norm				norm
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	Mode Type			M(Harm)	M(Harm)				M(Harm)
	Focal Depth		(cm)	1,5	4,5				4,5

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RIC6-12-D **Operating Mode:** B+M Mode

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt}\leq1\ cm^2$	$A_{aprt}>1\ cm^2$			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	6,1	5,8	-	-	5,8	-	
Output Power	P	(mW)			-	-		-	14
Bounded output Power	P_1	(mW)		6			8		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak tempora average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0,12					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,08					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,5						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3,0						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			0,3
Equivalent aperture diameter	D_{eq}	(cm)				-			0,6
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)	0,9						

A-1-65 Tables for RIC6-12-D at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RIC6-12-D **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt}\le1$	$A_{aprt}>1$		
Global Maximum Index Value				1,2	-	0,4	-	0,5	0,4
	IEC	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3,1					
	P	W_o	(mW)		-	11		7	11
	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)					1,1	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	1,4					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,2	
	f_{awf}	f_c	(MHz)	6,9	-	7,0	-	6,4	7,0
	Dim of A_{aprt}		X (cm)		-	0,9	-	0,6	0,9
			Y (cm)		-	0,4	-	0,4	0,4
	t_d	PD	(µsec)	0,4					
	prr	PRF	(Hz)	1300					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	4,2					
Other	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					0,2	
Information	Focal Length		FL_x (cm)		-	6,0	-		6,0
			FL_y (cm)		-	3,0	-		3,0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	285					
	Gate width		(cm)	0,1		0,1		0,1	0,1
Operating	Gate pos		(cm)	0,0		2,6		0,0	2,6
Control	B-Imagesector angle		(Degree)	1,3		7,0		4,4	7,0
Conditions	Power		(%)	100		100		100	100

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RIC6-12-D **Operating Mode:** Pulsed Doppler

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt}\le1$	$A_{aprt}>1$			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	6,9	-	7,0	-	-	6,4	
Output Power	P	(mW)			11	-		7	11
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				-		2,3	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				-		512	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		292	
pulse intensity integral	I_{pi}	(mWs/cm²)	0,20					0,12	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,10					0,07	
Peak-rarefactional acoustic pressure	p_r	(MPa)	4,2						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3,1						
-12 dB output beam area	A_{aprt}	(cm²)			0,3	-			0,3
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)	1,4						

A-1-66 Tables for RIC6-12-D at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RIC6-12-D **Operating Mode:** Color Flow

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1$	$A_{aprt} > 1$		
Global Maximum Index Value				1,2	0,1	-	-	-	0,3
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3,1					
	P	W_o	(mW)		18	-		-	19
	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)	6,4	6,6	-	-	-	6,5
	Dim of A_{aprt}		X (cm)		4,1	-	-	-	4,1
			Y (cm)		0,4	-	-	-	0,4
Other Information	t_d	PD	(µsec)	0,5					
	prr	PRF	(Hz)	2160					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3,5					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		6,0	-	-		6,0
			FL_y (cm)		3,0	-	-		3,0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	379					
Operating Control Conditions	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	13,0	13,0				13,0
	B-Imagesector angle		(Degree)	145,8	145,8				145,8
	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)	0,0	4,6				8,3
	CFM Box end		(cm)	2,0	6,6				10,2
	CFM Box angle		(Degree)	145,8	145,8				145,8
	CFM Tx power		(%)	100	100				100
	Ensemble			7,0	9,0				31,0
	Line Density			1	9				1
	Flow Res			high	low				high
	Velocity Range		(kHz)	7,5	0,1				5,0
	CFM Quality			low	high				norm
	CFM Frequency			low	low				low

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RIC6-12-D **Operating Mode:** Color Flow

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \le 1$	$A_{aprt} > 1$			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	6,4	6,6	-	-	6,6	-	
Output Power	P	(mW)			-	-		-	19
Bounded output Power	P_1	(mW)		4			4		
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)	0,22					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,5						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3,1						
-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)	0,7						

A-1-67 Tables for RIC6-12-D at Color/Motion Mode (CM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RIC6-12-D **Operating Mode:** cM-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt}\leq1$ cm²	$A_{aprt}>1$ cm²		
Global Maximum Index Value				1,2	0,5	-	-	-	0,5
	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)	1,7					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	7,0	7,0	-	-	-	7,0
	Dim of A_{aprt}		X (cm)		1,1	-	-	-	1,1
			Y (cm)		0,4	-	-	-	0,4
Other Information	t_d	PD	(µsec)	0,7					
	prr	PRF	(Hz)	150					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	4,8					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		6,0	-	-		6,0
			FL_y (cm)		3,0	-	-		3,0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	330					
Operating Control Conditions	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	13,0	13,0				13,0
	B-Imagesector angle		(Degree)	20	149				149
	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		(%)	80	1				1
	Mc Tx Power		(%)	100	100				100
	Ensemble			16	8				8
	Flow Res			high	high				high
	Velocity Range		(kHz)	0,1	3,2				3,2
	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: RIC6-12-D **Operating Mode:** cM-Mode

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning $A_{aprt}\leq1$ cm²	Non-Scanning $A_{aprt}>1$ cm²	Scanning	Non-Scanning	
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	7,0	7,0	-	-	7,0	-	
Output Power	P	(mW)			-	-		-	15
Bounded output Power	P_1	(mW)		15			20		
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)	0,55					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,24					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	4,8						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3,3						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			0,4
Equivalent aperture diameter	D_{eq}	(cm)				-			0,8
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)	1,7						

A-1-68 Tables for RSP6-16-D at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RSP6-16-D **Operating Mode:** B-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1$	$A_{aprt} > 1$		
Global Maximum Index Value				1,3	0,4	-	-	-	0,9
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3,1					
	P	W_o	(mW)		36	-		-	56
	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)	6,2	8,7	-	-	-	8,7
	Dim of A_{aprt}		X (cm)		3,5	-	-	-	5,3
			Y (cm)		0,4	-	-	-	0,4
Other Information	t_d	PD	(µsec)	0,3					
	prr	PRF	(Hz)	5820					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	4,0					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		4,5	-	-		6,0
			FL_y (cm)		1,5	-	-		1,5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	399					
Operating Control Conditions	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	7,9	7,9				7,9
	B-Imagesector width		(cm)	3,7	3,7				3,7
	Quality			high	high				high
	Zoom			1,0	1,0				1,0
	Foc. Zones			1	1				1
	Frequency Setting			Low	-				-
	SENS PRI			-	1,0				1,0
	Power		(%)	100	100				100
	ZoomBox start		(cm)	0,0	2,1				0,0
	ZoomBox end		(cm)	1,6	3,7				1,6
	ZoomBox width		(cm)	3,7	2,3				3,7
	Mode Type			B(Harm)	BFlow				BFlow
	Focal Depth		(cm)	2,0	4,5				6,0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RSP6-16-D **Operating Mode:** B-Mode

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \le 1$	$A_{aprt} > 1$			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	6,2	8,7	-	-	8,7	-	
Output Power	P	(mW)			-	-		-	56
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)	0,26					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,14					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	4,0						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3,1						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			2,1
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)	1,4						

A-1-69 Tables for RSP6-16-D at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RSP6-16-D **Operating Mode:** B+M Mode

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	-	-	-	0,7
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3,1					
	P	W_o	(mW)		37	-		-	37
	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)	6,2	6,2	-	-	-	6,2
	Dim of A_{aprt}		X (cm)		1,3	-	-	-	1,3
			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)	4,0					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		4,8	-	-		4,8
			FL_y (cm)		1,5	-	-		1,5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	399					
Operating Control Conditions	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	7,9	7,9				7,9
	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			penet	penet				penet
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	Mode Type			M(Harm)	M(Harm)				M(Harm)
	Focal Depth		(cm)	2,0	4,8				4,8

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RSP6-16-D **Operating Mode:** B+M Mode

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning $A_{aprt} \le 1\ cm^2$	Non-Scanning $A_{aprt} > 1\ cm^2$	Scanning	Non-Scanning	
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	6,2	6,2	-	-	6,2	-	
Output Power	P	(mW)			-	-		-	37
Bounded output Power	P_1	(mW)		12			11		
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)	0,14					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	4,0						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3,1						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			0,5
Equivalent aperture diameter	D_{eq}	(cm)				-			0,8
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)	1,4						

A-1-70 Tables for RSP6-16-D at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RSP6-16-D **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS scan	TIS non-scan $A_{aprt}\leq1$	TIS non-scan $A_{aprt}>1$	TIB non-scan	TIC
Global Maximum	Index Value			1,0	-	1,1	-	1,7	0,9
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,7					
	P	W_o	(mW)		-	27		27	27
	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)					0,8	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	0,7					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,3	
	f_{awf}	f_c	(MHz)	7,2	-	8,2	-	6,3	6,3
	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)	0,7					
	prr	PRF	(Hz)	1300					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3,1					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					0,3	
	Focal Length		FL_x (cm)		-	5,5	-		5,5
			FL_y (cm)		-	1,5	-		1,5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	287					
Operating Control Conditions	Gate width		(cm)	0,1		0,3		0,5	0,5
	Gate pos		(cm)	0,8		3,2		3,2	3,2
	B-Imagesector angle		(Degree)	1,3		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: RSP6-16-D **Operating Mode:** Pulsed Doppler

notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units	MI	TIS Scanning	TIS Non-Scanning $A_{aprt}\leq1$	TIS Non-Scanning $A_{aprt}>1$	TIB Scanning	TIB Non-Scanning	TIC
Acoustic working frequency	f_{awf}	(MHz)	7,2	-	8,2	-	-	6,3	
Output Power	P	(mW)			27	-		27	27
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				-		7,3	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				-		461	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		308	
pulse intensity integral	I_{pi}	(mWs/cm²)	0,33					0,14	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,23					0,09	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,1						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,7						
-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)						0,8	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	0,7						

A-1-71 Tables for RSP6-16-D at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RSP6-16-D **Operating Mode:** Color Flow

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt}\le1$	$A_{aprt}>1$		
Global Maximum Index Value				1,2	0,5	-	-	-	1,2
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3,6					
	P	W_o	(mW)		63	-		-	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)	1,0					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	8,2	7,2	-	-	-	7,2
	Dim of A_{aprt}		X (cm)		4,0	-	-	-	4,9
			Y (cm)		0,4	-	-	-	0,4
Other Information	t_d	PD	(µsec)	0,6					
	prr	PRF	(Hz)	4050					
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	4,6					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		0,9	-	-		5,5
			FL_y (cm)		1,5	-	-		1,5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	476					
Operating Control Conditions	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	7,9	7,9				7,9
	B-Imagesector width		(cm)	3,7	3,7				3,7
	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)	0,8	0,6				6,4
	CFM Box end		(cm)	2,0	1,7				7,6
	CFM Box width		(cm)	3,7	3,7				3,7
	CFM Tx power		(%)	100	100				100
	Ensemble			22,0	31,0				7,0
	Line Density			1	2				8
	Flow Res			low	low				high
	Velocity Range		(kHz)	0,1	15,5				6,0
	CFM Quality			low	high				low
	CFM Frequency			high	mid				mid

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RSP6-16-D **Operating Mode:** Color Flow

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning $A_{aprt}\le1$	Non-Scanning $A_{aprt}>1$	Scanning	Non-Scanning	
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	8,2	7,2	-	-	7,2	-	
Output Power	P	(mW)			-	-		-	77
Bounded output Power	P_1	(mW)		16			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)	0,83					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,47					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	4,6						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3,6						
-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)	1,0						

A-1-72 Tables for RAM3-8 at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RAM3-8 **Operating Mode:** B-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt}\le1$	$A_{aprt}>1$		
Global Maximum Index Value				1,3	0,2	-	-	-	0,7
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,0					
	P	W_o	(mW)		67	-		-	105
	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)	2,7	2,9	-	-	-	2,9
	Dim of A_{aprt}		X (cm)		4,3	-	-	-	6,7
			Y (cm)		1,5	-	-	-	1,5
Other Information	t_d	PD	(µsec)	0,8					
	prr	PRF	(Hz)	2880					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2,4					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		6,0	-	-		10,0
			FL_y (cm)		9,0	-	-		9,0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	186					
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)	60,0	60,0				60,0
	Quality			high	high				high
	Zoom			1,0	1,0				1,0
	Foc. Zones			1	1				1
	Frequency Setting			Low	High				High
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	ZoomBox start		(cm)	14,7	0,2				0,0
	ZoomBox end		(cm)	19,9	2,2				2,0
	ZoomBox angle		(Degree)	60,0	37,5				60,0
	Mode Type			B(Harm)	B(Harm)				B(Harm)
	Focal Depth		(cm)	4,5	6,0				10,0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RAM3-8 **Operating Mode:** B-Mode

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt}\le1$	$A_{aprt}>1$			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	2,7	2,9	-	-	2,9	-	
Output Power	P	(mW)			-	-		-	105
Bounded output Power	P_1	(mW)		16			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)	0,24					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,15					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2,4						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,0						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			10,1
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)	2,3						

A-1-73 Tables for RAM3-8 at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RAM3-8 **Operating Mode:** B+M Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt}\le 1$ cm²	$A_{aprt}>1$ cm²		
Global Maximum Index Value				1,0	0,2	-	-	-	0,5
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	1,6					
	P	W_o	(mW)		40	-		-	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)	2,9					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2,7	2,6	-	-	-	2,6
	Dim of A_{aprt}		X (cm)		1,4	-	-	-	1,4
			Y (cm)		1,5	-	-	-	1,5
Other Information	t_d	PD	(µsec)	0,8					
	prr	PRF	(Hz)	900					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2,0					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		11,0	-	-		11,0
			FL_y (cm)		9,0	-	-		9,0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	119					
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)	60,0	60,0				60,0
	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(Harm)	M(Harm)				M(Harm)
	Focal Depth		(cm)	4,5	11,0				11,0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RAM3-8 **Operating Mode:** B+M Mode

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning $A_{aprt}\le 1$ cm²	Non-Scanning $A_{aprt}>1$ cm²	Scanning	Non-Scanning	
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	2,7	2,6	-	-	2,6	-	
Output Power	P	(mW)			-	-		-	40
Bounded output Power	P_1	(mW)		13			46		
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)	2,0						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	1,6						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			2,1
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)	2,9						

A-1-74 Tables for RAM3-8 at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RAM3-8 **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt}\leq1$	$A_{aprt}>1$		
Global Maximum Index Value				1,2	-	-	0,4	0,8	0,6
	IEC	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,2					
	P	W_o	(mW)		-	-		15	41
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				23,2		
Assoc.	z_s	z_1	(cm)				2,5		
Acoustic	z_{bp}	z_{bp}	(cm)				2,4		
Parameter	z_b	z_{sp}	(cm)					2,2	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	2,4					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,2	
	f_{awf}	f_c	(MHz)	3,3	-	-	3,4	3,3	3,4
	Dim of A_{aprt}		X (cm)		-	-	1,4	0,9	1,4
			Y (cm)		-	-	1,5	0,9	1,5
	t_d	PD	(µsec)	0,4					
	prr	PRF	(Hz)	1300					
	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)					0,2	
Information	Focal Length		FL_x (cm)		-	-	12,0		12,0
			FL_y (cm)		-	-	9,0		9,0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	257					
	Gate width		(cm)	0,1			0,2	0,1	0,2
Operating	Gate pos		(cm)	0,0			7,8	0,0	7,8
Control	B-Imagesector angle		(Degree)	1,3			3,3	2,2	3,3
Conditions	Power		(%)	100			100	100	100

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RAM3-8 **Operating Mode:** Pulsed Doppler

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt}\leq1$	$A_{aprt}>1$			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	3,3	-	-	3,4	-	3,3	
Output Power	P	(mW)			-	41		15	41
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				23		3,7	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				279		282	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				75		167	
pulse intensity integral	I_{pi}	(mWs/cm²)	0,20					0,13	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,12					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)			-	2,1			2,1
Equivalent aperture diameter	D_{eq}	(cm)				1,6			1,6
Depth for *TIS*	z_s	(cm)				2,5			
Depth for *TIB*	z_b	(cm)						2,2	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	2,4						

A-1-75 Tables for RAM3-8 at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RAM3-8 **Operating Mode:** Color Flow

Index Label				MI	TIS scan	TIS non-scan $A_{aprt} \le 1$	TIS non-scan $A_{aprt} > 1$	TIB non-scan	TIC
Global Maximum Index Value				1,3	0,2	-	-	-	0,7
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,3					
	P	W_o	(mW)		92	-		-	96
	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)	3,2	3,4	-	-	-	3,4
	Dim of A_{aprt}		X (cm)		6,7	-	-	-	7,1
			Y (cm)		1,5	-	-	-	1,5
Other Information	t_d	PD	(µsec)	0,8					
	prr	PRF	(Hz)	1200					
	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	-	-		12,0
			FL_y (cm)		9,0	-	-		9,0
	$I_{pa,\alpha}$ 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	26,0				26,0
	B-Imagesector angle		(Degree)	60,0	60,0				60,0
	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)	5,5	6,5				9,2
	CFM Box end		(cm)	9,4	10,4				13,1
	CFM Box angle		(Degree)	60,0	60,0				60,0
	CFM Tx power		(%)	100	100				100
	Ensemble			7,0	7,0				7,0
	Line Density			1	9				9
	Flow Res			high	low				low
	Velocity Range		(kHz)	0,1	0,1				0,1
	CFM Quality			low	low				low
	CFM Frequency			mid	mid				mid

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RAM3-8 **Operating Mode:** Color Flow

Index			MI	TIS Scanning	TIS Non-Scanning $A_{aprt} \le 1$	TIS Non-Scanning $A_{aprt} > 1$	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	3,4	-	-	3,4	-	
Output Power	P	(mW)			-	-		-	96
Bounded output Power	P_1	(mW)		14			14		
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)	0,39					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,14					-	
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)			-	-			10,6
Equivalent aperture diameter	D_{eq}	(cm)				-			3,7
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)	4,5						

A-1-76 Tables for RAM3-8 at Color/Motion Mode (CM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RAM3-8 **Operating Mode:** cM-Mode

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	-	-	-	0,7
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,3					
	P	W_o	(mW)		43	-		-	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)					-	
	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)	3,2	3,2	-	-	-	3,2
	Dim of A_{aprt}		X (cm)		1,5	-	-	-	1,7
			Y (cm)		1,5	-	-	-	1,5
Other Information	t_d	PD	(µsec)	0,8					
	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)		10,0	-	-		12,0
			FL_y (cm)		9,0	-	-		9,0
	$I_{pa,\alpha}$ 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	26,0				26,0
	B-Imagesector angle		(Degree)	20	60				60
	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		(%)	100	1				1
	Mc Tx Power		(%)	100	100				100
	Ensemble			16	8				12
	Flow Res			high	high				high
	Velocity Range		(kHz)	0,1	1,3				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: RAM3-8 **Operating Mode:** cM-Mode

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)	3,2	3,2	-	-	2,8	-	
Output Power	P	(mW)			-	-		-	50
Bounded output Power	P_1	(mW)		24			69		
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)	0,39					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,14					-	
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)	4,5						

A-1-77 Tables for RSM5-14 at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RSM5-14 **Operating Mode:** B-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1$	$A_{aprt} > 1$		
Global Maximum	Index Value			1,3	0,2	-	-	-	0,5
	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3,1					
	P	W_o	(mW)		12	-		-	37
	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)	1,0					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	6,1	6,0	-	-	-	4,7
	Dim of A_{aprt}		X (cm)		1,7	-	-	-	5,1
			Y (cm)		0,6	-	-	-	0,6
	t_d	PD	(µsec)	0,2					
	prr	PRF	(Hz)	5780					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3,7					
Other	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
Information	Focal Length		FL_x (cm)		2,1	-	-		4,5
			FL_y (cm)		1,4	-	-		1,4
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	333					
	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	7,9	1,9				7,9
	B-Imagesector width		(cm)	3,7	3,7				3,7
	Quality			high	low				high
Operating	Zoom			1,0	1,0				1,0
Control	Foc. Zones			1	1				1
Conditions	Frequency Setting			High	High				High
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	ZoomBox start		(cm)	0,0	0,9				0,3
	ZoomBox end		(cm)	1,6	1,9				1,9
	ZoomBox width		(cm)	3,7	0,8				3,7
	Mode Type			B(Harm)	B(Harm)				B(Harm)
	Focal Depth		(cm)	1,5	2,1				4,5

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RSM5-14 **Operating Mode:** B-Mode

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning $A_{aprt} \le 1$	Non-Scanning $A_{aprt} > 1$	Scanning	Non-Scanning	
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	6,1	6,0	-	-	6,0	-	
Output Power	P	(mW)			-	-		-	37
Bounded output Power	P_1	(mW)		8			8		
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)	0,11					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,07					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,7						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3,1						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			3,0
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)	1,0						

A-1-78 Tables for RSM5-14 at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RSM5-14 **Operating Mode:** B+M Mode

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	0,2	-	-	-	0,4
	IEC	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3,1					
	P	W_o	(mW)		25	-		-	29
	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)	1,0					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	6,1	5,7	-	-	-	5,1
	Dim of A_{aprt}		X (cm)		1,1	-	-	-	1,3
			Y (cm)		0,6	-	-	-	0,6
	t_d	PD	(µsec)	0,2					
	prr	PRF	(Hz)	450					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3,7					
Other	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
Information	Focal Length		FL_x (cm)		3,6	-	-		4,5
			FL_y (cm)		1,5	-	-		1,5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	333					
	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	7,9	7,9				7,9
	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			resol	resol				penet
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	Mode Type			M(Harm)	M(Harm)				M(Harm)
	Focal Depth		(cm)	1,5	3,6				4,5

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RSM5-14 **Operating Mode:** B+M Mode

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)	6,1	5,7	-	-	5,4	-	
Output Power	P	(mW)			-	-		-	29
Bounded output Power	P_1	(mW)		8			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)	0,11					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,07					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,7						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3,1						
-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)	1,0						

A-1-79 Tables for RSM5-14 at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RSM5-14 **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS scan	TIS non-scan $A_{aprt}\le1$	TIS non-scan $A_{aprt}>1$	TIB non-scan	TIC
Global Maximum Index Value				1,2	-	1,0	-	0,9	0,9
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,7					
	P	W_o	(mW)		-	32		27	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)					1,5	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	0,8					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,4	
	f_{awf}	f_c	(MHz)	5,4	-	6,6	-	5,9	6,6
	Dim of A_{aprt}		X (cm)		-	1,1	-	1,1	1,1
			Y (cm)		-	0,6	-	0,6	0,6
Other Information	t_d	PD	(µsec)	0,5					
	prr	PRF	(Hz)	1300					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	2,9					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					0,4	
	Focal Length		FL_x (cm)		-	5,5	-		5,5
			FL_y (cm)		-	1,4	-		1,4
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	314					
Operating Control Conditions	Gate width		(cm)	0,1		0,1		0,3	0,1
	Gate pos		(cm)	0,0		3,2		3,2	3,2
	B-Imagesector angle		(Degree)	1,3		4,4		2,2	4,4
	Power		(%)	100		100		100	100

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RSM5-14 **Operating Mode:** Pulsed Doppler

Index			MI	TIS Scanning	TIS Non-Scanning $A_{aprt}\le1$	TIS Non-Scanning $A_{aprt}>1$	TIB Scanning	TIB Non-Scanning	TIC
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	5,4	-	6,6	-	-	5,9	
Output Power	P	(mW)			32	-		27	32
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				-		4,0	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				-		315	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		153	
pulse intensity integral	I_{pi}	(mWs/cm²)	0,29					0,14	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,23					0,07	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2,9						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,7						
-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)						1,5	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	0,8						

A-1-80 Tables for RSM5-14 at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: **RSM5-14** **Operating Mode:** Color Flow

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt}\le1$	$A_{aprt}>1$		
Global Maximum Index Value				1,3	0,4	-	-	-	0,8
	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3,2					
	P	W_o	(mW)		15	-		-	61
	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)	0,5					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	6,7	6,7	-	-	-	6,4
	Dim of A_{aprt}		X (cm)		1,2	-	-	-	4,8
			Y (cm)		0,6	-	-	-	0,6
	t_d	PD	(µsec)	0,7					
	prr	PRF	(Hz)	6340					
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	3,6					
Other	d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)					-	
Information	Focal Length		FL_x (cm)		2,2	-	-		5,5
			FL_y (cm)		1,4	-	-		1,4
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	468					
	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	7,9	7,9				7,9
	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	1,4				6,2
	CFM Box end		(cm)	1,2	2,6				7,4
	CFM Box width		(cm)	3,7	0,6				3,7
	CFM Tx power		(%)	100	100				100
	Ensemble			7,0	7,0				7,0
	Line Density			1	10				8
	Flow Res			low	low				high
	Velocity Range		(kHz)	18	0,1				0,1
	CFM Quality			low	low				low
	CFM Frequency			high	high				high

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: **RSM5-14** **Operating Mode:** Color Flow

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt}\le1$	$A_{aprt}>1$			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	6,7	6,7	-	-	6,7	-	
Output Power	P	(mW)			-	-		-	61
Bounded output Power	P_1	(mW)		13			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)	0,52					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,40					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,6						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3,2						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			2,9
Equivalent aperture diameter	D_{eq}	(cm)				-			1,9
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)	0,5						

A-1-81 Tables for RRE6-10-D at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RRE6-10-D **Operating Mode:** B-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1$	$A_{aprt} > 1$		
Global Maximum	Index Value			1,2	0,1	-	-	-	0,3
	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,6					
	P	W_o	(mW)		4	-		-	16
	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)	5,0	4,6	-	-	-	4,5
	Dim of A_{aprt}		X (cm)		1,0	-	-	-	4,2
			Y (cm)		0,5	-	-	-	0,5
	t_d	PD	(µsec)	0,3					
	prr	PRF	(Hz)	2540					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3,2					
Other	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
Information	Focal Length		FL_x (cm)		2,0	-	-		7,0
			FL_y (cm)		3,5	-	-		3,5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	367					
	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	12,0	12,0				12,0
	B-Imagesector angle		(Degree)	144,5	20,0				144,5
	Quality			low	low				high
Operating	Zoom			1,0	1,0				1,0
Control	Foc. Zones			1	1				1
Conditions	Frequency Setting			High	Mid				Mid
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	ZoomBox start		(cm)	8,4	1,2				6,8
	ZoomBox end		(cm)	10,8	3,6				9,2
	ZoomBox angle		(Degree)	144,5	20,0				144,5
	Mode Type			B(Harm)	B(Harm)				B(Harm)
	Focal Depth		(cm)	2,0	2,0				7,0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RRE6-10-D **Operating Mode:** B-Mode

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \le 1$	$A_{aprt} > 1$			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	5,0	4,6	-	-	4,6	-	
Output Power	P	(mW)			-	-		-	16
Bounded output Power	P_1	(mW)		4			4		
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)	0,10					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,2						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,6						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			2,1
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)	1,4						

A-1-82 Tables for RRE6-10-D at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RRE6-10-D **Operating Mode:** B+M Mode

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	0,1	-	-	-	0,2
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,2					
	P	W_o	(mW)		11	-		-	11
	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)	1,3					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	4,6	4,6	-	-	-	4,6
	Dim of A_{aprt}		X (cm)		1,2	-	-	-	1,2
			Y (cm)		0,5	-	-	-	0,5
Other Information	t_d	PD	(µsec)	0,5					
	prr	PRF	(Hz)	450					
	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)		5,5	-	-		5,5
			FL_y (cm)		3,5	-	-		3,5
	$I_{pa,\alpha}$ 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)	12,0	12,0				12,0
	B-Imagesector angle		(Degree)	144,5	144,5				144,5
	Quality			low	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
	Mode Type			M(Harm)	M(Harm)				M(Harm)
	Focal Depth		(cm)	2,0	5,5				5,5

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RRE6-10-D **Operating Mode:** B+M Mode

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	0,1	-	-	-	0,2
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,2					
	P	W_o	(mW)		11	-		-	11
	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)	1,3					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	4,6	4,6	-	-	-	4,6
	Dim of A_{aprt}		X (cm)		1,2	-	-	-	1,2
			Y (cm)		0,5	-	-	-	0,5
Other Information	t_d	PD	(µsec)	0,5					
	prr	PRF	(Hz)	450					
	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)		5,5	-	-		5,5
			FL_y (cm)		3,5	-	-		3,5
	$I_{pa,\alpha}$ 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)	12,0	12,0				12,0
	B-Imagesector angle		(Degree)	144,5	144,5				144,5
	Quality			low	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
	Mode Type			M(Harm)	M(Harm)				M(Harm)
	Focal Depth		(cm)	2,0	5,5				5,5

A-1-83 Tables for RRE6-10-D at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RRE6-10-D **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1$	$A_{aprt} > 1$		
Global Maximum Index Value				1,1	-	0,3	-	0,5	0,3
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,4					
	P	W_o	(mW)		-	11		11	11
	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)					1,6	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	1,8					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,3	
	f_{awf}	f_c	(MHz)	5,1	-	5,3	-	5,3	5,3
	Dim of A_{aprt}		X (cm)		-	1,1	-	1,1	1,1
			Y (cm)		-	0,5	-	0,5	0,5
Other Information	t_d	PD	(µsec)	0,5					
	prr	PRF	(Hz)	1300					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3,2					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					0,3	
	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)	226					
Operating Control Conditions	Gate width		(cm)	0,1		0,4		0,4	0,4
	Gate pos		(cm)	0,0		3,7		3,7	3,7
	B-Imagesector angle		(Degree)	1,3		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: RRE6-10-D **Operating Mode:** Pulsed Doppler

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \le 1$	$A_{aprt} > 1$			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	5,1	-	5,3	-	-	5,3	
Output Power	P	(mW)			11	-		11	11
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				-		2,3	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				-		170	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		91	
pulse intensity integral	I_{pi}	(mWs/cm²)	0,20					0,13	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,10					0,07	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,2						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,4						
-12 dB output beam area	A_{aprt}	(cm²)			0,5	-			0,5
Equivalent aperture diameter	D_{eq}	(cm)				-			0,8
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						1,6	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1,8						

A-1-84 Tables for RRE6-10-D at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RRE6-10-D **Operating Mode:** Color Flow

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt}\leq1$	$A_{aprt}>1$		
Global Maximum Index Value				1,0	0,1	-	-	-	0,3
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,3					
	P	W_o	(mW)		16	-		-	19
	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)	5,3	5,3	-	-	-	5,2
	Dim of A_{aprt}		X (cm)		3,6	-	-	-	4,4
			Y (cm)		0,5	-	-	-	0,5
Other Information	t_d	PD	(µsec)	0,9					
	prr	PRF	(Hz)	1530					
	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)		2,5	-	-		8,0
			FL_y (cm)		3,5	-	-		3,5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	297					
Operating Control Conditions	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	12,0	12,0				12,0
	B-Imagesector angle		(Degree)	144,5	144,5				144,5
	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)	1,3	1,3				6,4
	CFM Box end		(cm)	3,1	3,1				8,2
	CFM Box angle		(Degree)	144,5	144,5				144,5
	CFM Tx power		(%)	100	100				100
	Ensemble			7,0	22,0				7,0
	Line Density			1	1				1
	Flow Res			high	high				high
	Velocity Range		(kHz)	0,1	11,0				6,0
	CFM Quality			low	low				low
	CFM Frequency			low	low				low

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RRE6-10-D **Operating Mode:** Color Flow

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt}\leq1$	$A_{aprt}>1$			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	5,3	5,3	-	-	5,3	-	
Output Power	P	(mW)			-	-		-	19
Bounded output Power	P_1	(mW)		4			4		
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)	0,59					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,33					-	
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)			-	-			2,2
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)	1,6						

A-1-85 Tables for RNA5-9-D at 2D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RNA5-9-D **Operating Mode:** B-Mode

Index Label					MI	TIS			TIB	TIC
						scan	non-scan		non-scan	
							$A_{aprt}\le1$	$A_{aprt}>1$		
Global Maximum	Index Value				1,2	0,3	-	-	-	0,8
	IEC	FDA	Units							
	$p_{r\alpha}$	$p_{r.3}$	(MPa)		2,5					
	P	W_o	(mW)			29	-		-	55
	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)		1,0					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)						-	
	f_{awf}	f_c	(MHz)		4,2	5,0	-	-	-	3,7
	Dim of A_{aprt}			X (cm)		2,6	-	-	-	4,5
				Y (cm)		0,5	-	-	-	0,5
	t_d	PD	(µsec)		0,4					
	prr	PRF	(Hz)		5190					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)		2,7					
Other	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)						-	
Information	Focal Length			FL_x (cm)		2,5	-	-		8,0
				FL_y (cm)		3,8	-	-		3,8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)		227					
	B-Imagesector start		(cm)		0,0	0,0				0,0
	B-Imagesector end		(cm)		18,0	18,0				18,0
	B-Imagesector angle		(Degree)		115,7	115,7				115,7
	Quality				high	low				low
Operating	Zoom				1,0	1,0				1,0
Control	Foc. Zones				1	1				1
Conditions	Frequency Setting				Mid	-				Low
	SENS PRI				-	1,0				-
	Power		(%)		100	100				100
	ZoomBox start		(cm)		0,0	6,9				7,8
	ZoomBox end		(cm)		3,6	9,9				11,4
	ZoomBox angle		(Degree)		115,7	69,4				115,7
	Mode Type				B(Harm)	BFlow				B(Harm)
	Focal Depth		(cm)		1,0	2,5				8,0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RNA5-9-D **Operating Mode:** B-Mode

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt}\le1$	$A_{aprt}>1$			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	4,2	5,0	-	-	5,0	-	
Output Power	P	(mW)			-	-		-	55
Bounded output Power	P_1	(mW)		11			11		
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)	0,12					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,09					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2,7						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,5						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			2,3
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)	1,0						

A-1-86 Tables for RNA5-9-D at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RNA5-9-D **Operating Mode:** B+M Mode

Index Label				MI	TIS scan	TIS non-scan $A_{aprt}\leq1$ cm²	TIS non-scan $A_{aprt}>1$ cm²	TIB non-scan	TIC
Global Maximum Index Value				1,2	0,4	-	-	-	0,9
	IEC	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,5					
	P	W_o	(mW)		41	-		-	46
	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)	1,0					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	4,2	4,3	-	-	-	3,7
	Dim of A_{aprt}	X	(cm)		1,3	-	-	-	1,3
		Y	(cm)		0,5	-	-	-	0,5
	t_d	PD	(µsec)	0,4					
	prr	PRF	(Hz)	450					
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	2,7					
Other	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					-	
Information	Focal Length	FL_x	(cm)		8,0	-	-		8,0
		FL_y	(cm)		3,8	-	-		3,8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	227					
	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	18,0	18,0				18,0
	B-Imagesector angle		(Degree)	115,7	115,7				115,7
	Quality			low	low				low
Operating	Zoom			1,0	1,0				1,0
Control	Foc. Zones			1	1				1
Conditions	Frequency Setting			norm	resol				penet
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	Mode Type			M(Harm)	M(Harm)				M(Harm)
	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: RNA5-9-D **Operating Mode:** B+M Mode

Index			MI	TIS Scanning	TIS Non-Scanning $A_{aprt}\leq1$ 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)	4,2	4,3	-	-	3,7	-	
Output Power	P	(mW)			-	-		-	46
Bounded output Power	P_1	(mW)		20			36		
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)	0,12					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,09					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2,7						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,5						
-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)	1,0						

A-1-87 Tables for RNA5-9-D at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RNA5-9-D **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \le 1$	$A_{aprt} > 1$		
Global Maximum	Index Value			1,2	-	1,1	-	1,7	1,3
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,6					
	P	W_o	(mW)		-	44		39	44
	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)	1,4					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,4	
	f_{awf}	f_c	(MHz)	4,5	-	5,4	-	3,8	5,4
	Dim of A_{aprt}		X (cm)		-	1,2	-	1,2	1,2
			Y (cm)		-	0,5	-	0,5	0,5
Other Information	t_d	PD	(µsec)	0,5					
	prr	PRF	(Hz)	1300					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3,0					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					0,4	
	Focal Length		FL_x (cm)		-	10,0	-		10,0
			FL_y (cm)		-	3,8	-		3,8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	161					
Operating Control Conditions	Gate width		(cm)	0,1		0,1		0,1	0,1
	Gate pos		(cm)	0,0		5,4		5,4	5,4
	B-Imagesector angle		(Degree)	1,3		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: RNA5-9-D **Operating Mode:** Pulsed Doppler

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \le 1$	$A_{aprt} > 1$			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	4,5	-	5,4	-	-	3,8	
Output Power	P	(mW)			44	-		39	44
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				-		7,6	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				-		287	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		202	
pulse intensity integral	I_{pi}	(mWs/cm²)	0,14					0,13	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,09					0,09	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,0						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,6						
-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)						1,1	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1,4						

A-1-88 Tables for RNA5-9-D at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RNA5-9-D **Operating Mode:** Color Flow

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt}\le1$	$A_{aprt}>1$		
Global Maximum Index Value				1,3	0,4	-	-	-	1,2
	IEC	FDA	Units						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,6					
	P	W_o	(mW)		28	-		-	82
	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)	1,1					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	4,5	5,4	-	-	-	4,5
	Dim of A_{aprt}		X (cm)		1,8	-	-	-	4,8
			Y (cm)		0,5	-	-	-	0,5
Other Information	t_d	PD	(µsec)	1,0					
	prr	PRF	(Hz)	1860					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	3,2					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					-	
	Focal Length		FL_x (cm)		10,0	-	-		10,0
			FL_y (cm)		3,8	-	-		3,8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	272					
Operating Control Conditions	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	18,0	18,0				18,0
	B-Imagesector angle		(Degree)	115,7	10,0				115,7
	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)	1,9	10,2				8,3
	CFM Box end		(cm)	4,6	12,9				11,0
	CFM Box angle		(Degree)	115,7	10,0				115,7
	CFM Tx power		(%)	100	100				100
	Ensemble			22,0	31,0				7,0
	Line Density			1	2				9
	Flow Res			low	high				high
	Velocity Range		(kHz)	0,1	4,0				0,1
	CFM Quality			low	high				low
	CFM Frequency			mid	high				mid

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RNA5-9-D **Operating Mode:** Color Flow

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning $A_{aprt}\le1$	Non-Scanning $A_{aprt}>1$	Scanning	Non-Scanning	
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	4,5	5,4	-	-	5,4	-	
Output Power	P	(mW)			-	-		-	82
Bounded output Power	P_1	(mW)		15			15		
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)	0,31					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,2						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,6						
-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)	1,1						

A-1-89 Tables for RNA5-9-D at Color/Motion Mode (CM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RNA5-9-D **Operating Mode:** cM-Mode

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	1,5	-	-	-	1,4
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,4					
	P	W_o	(mW)		57	-		-	57
	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)	1,3					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	3,8	5,4	-	-	-	5,4
	Dim of A_{aprt}		X (cm)		1,5	-	-	-	1,5
			Y (cm)		0,5	-	-	-	0,5
Other Information	t_d	PD	(µsec)	0,8					
	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)		10,0	-	-		10,0
			FL_y (cm)		3,8	-	-		3,8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	232					
Operating Control Conditions	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	18,0	18,0				18,0
	B-Imagesector angle		(Degree)	10	116				116
	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		(%)	92	1				1
	Mc Tx Power		(%)	100	100				100
	Ensemble			16	12				12
	Flow Res			high	high				high
	Velocity Range		(kHz)	0,1	3,2				3,2
	Speed			6,0	6,0				6,0
	Mc Frequency			Low	High				High

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RNA5-9-D **Operating Mode:** cM-Mode

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)	3,8	5,4	-	-	3,8	-	
Output Power	P	(mW)			-	-		-	57
Bounded output Power	P_1	(mW)		57			96		
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)	0,35					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,24					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2,9						
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)	1,3						

A-1-90 Tables for RNA5-9-D at Continuous Wave Doppler (CW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RNA5-9-D **Operating Mode:** Continuous Wave

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1 cm²	A_{aprt}>1 cm²		
Global Maximum Index Value				0,0	-	0,2	-	1,0	0,8
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	0,1					
	P	W_o	(mW)		-	12		12	12
	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)					0,4	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	1,3					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,3	
	f_{awf}	f_c	(MHz)	4,1	-	4,1	-	4,1	4,1
	Dim of A_{aprt}		X (cm)		-	0,3	-	0,3	0,3
			Y (cm)		-	0,5	-	0,5	0,5
Other Information	t_d	PD	(µsec)	5,0					
	prr	PRF	(Hz)	-					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	0,1					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					0,2	
	Focal Length		FL_x (cm)		-	5,0	-		5,0
			FL_y (cm)		-	3,8	-		3,8
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	0					
Operating Control Conditions	Velocity Range		(kHz)	10,1		10,1		10,1	10,1
	Power		(%)	100,0		100,0		100,0	100,0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RNA5-9-D **Operating Mode:** Continuous Wave

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)	4,1	-	4,1	-	-	4,1	
Output Power	P	(mW)			12	-		12	12
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				-		10,9	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				-		396	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		285	
pulse intensity integral	I_{pi}	(mWs/cm²)	-					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	-					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	0,1						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	0,1						
-12 dB output beam area	A_{aprt}	(cm²)			0,1	-			0,1
Equivalent aperture diameter	D_{eq}	(cm)				-			0,4
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						0,4	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1,3						

A-1-91 Tables for P2D at Continuous Wave Doppler (CW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: P2D **Operating Mode:** Continuous Wave

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt}\le1$	$A_{aprt}>1$		
Global Maximum	Index Value			0,1	-	-	0,3	1,3	0,7
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	0,1					
	P	W_o	(mW)		-	-		37	37
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				27,5		
	z_s	z_1	(cm)				2,1		
	z_{bp}	z_{bp}	(cm)				2,0		
	z_b	z_{sp}	(cm)					3,0	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	3,4					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,4	
	f_{awf}	f_c	(MHz)	2,1	-	-	2,1	2,1	2,1
	Dim of A_{aprt}		X (cm)		-	-	1,4	1,4	1,4
			Y (cm)		-	-	1,1	1,1	1,1
Other Information	t_d	PD	(µsec)	5,1					
	prr	PRF	(Hz)	-					
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	0,1					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					0,4	
	Focal Length		FL_x (cm)		-	-	5,0		5,0
			FL_y (cm)		-	-	6,0		6,0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	0					
Operating Control Conditions	Velocity Range		(kHz)	12,0			12,0	12,0	12,0
	Power		(%)	100,0			100,0	100,0	100,0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: P2D **Operating Mode:** Continuous Wave

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt}\le1$	$A_{aprt}>1$			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	2,1	-	-	2,1	-	2,1	
Output Power	P	(mW)			-	37		37	37
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				27		24,1	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				291		291	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				170		170	
pulse intensity integral	I_{pi}	(mWs/cm²)	-					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	-					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	0,1						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	0,1						
-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)						3,0	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	3,4						

A-1-92 Tables for P6D at Continuous Wave Doppler (CW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: P6D **Operating Mode:** Continuous Wave

Index Label				MI	TIS scan	TIS non-scan $A_{aprt}\leq1$	TIS non-scan $A_{aprt}>1$	TIB non-scan	TIC
Global Maximum Index Value				0,0	-	0,2	-	0,6	0,3
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	0,1					
	P	W_o	(mW)		-	7		7	7
	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)					0,2	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	0,2					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,2	
	f_{awf}	f_c	(MHz)	5,6	-	5,6	-	5,6	5,6
	Dim of A_{aprt}		X (cm)		-	0,5	-	0,5	0,5
			Y (cm)		-	0,4	-	0,4	0,4
Other Information	t_d	PD	(µsec)	5,1					
	prr	PRF	(Hz)	-					
	p_r at max. I_{pi}	p_r@PII_{max}	(MPa)	0,1					
	d_{eq} at max. I_{pi}	d_{eq}@PII_{max}	(cm)					0,2	
	Focal Length		FL_x (cm)		-	5,0	-		5,0
			FL_y (cm)		-	2,0	-		2,0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	0					
Operating Control Conditions	Velocity Range		(kHz)	12,0		12,0		12,0	12,0
	Power		(%)	100,0		100,0		100,0	100,0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: P6D **Operating Mode:** Continuous Wave

notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units	MI	TIS Scanning	TIS Non-Scanning $A_{aprt}\leq1$	TIS Non-Scanning $A_{aprt}>1$	TIB Scanning	TIB Non-Scanning	TIC
Acoustic working frequency	f_{awf}	(MHz)	5,6	-	5,6	-	-	5,6	
Output Power	P	(mW)			7	-		7	7
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				-		6,1	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				-		180	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		160	
pulse intensity integral	I_{pi}	(mWs/cm²)	-					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	-					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	0,1						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	0,1						
-12 dB output beam area	A_{aprt}	(cm²)			0,2	-			0,2
Equivalent aperture diameter	D_{eq}	(cm)				-			0,5
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						0,2	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	0,2						

INDEX

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