Anexa 33

SPECIFICȚIE TEHNICĂ COMPLETATĂ

Modelul: VIVID S70N V206 ED; PN: H45611MY; Producător: GE Healthcare si GE Vingmed Ultrasound AS; Țara: Norvegia

Specificarea tehnică deplină solicitată de către autoritatea contractantă	Specificarea tehnică deplină ofertantă de către autoritatea ofertantă
Ultrasonograf cardiovascular performanţă înaltă (EXPERT)	**DA** Ultrasonograf cardiovascular performanţă înaltă (EXPERT) **Pag. 1-3 din Vivid S70N product datasheet Rel 6.0**
APLICAŢII CLINICE: Cardio;	**DA** APLICAŢII CLINICE: Cardio, Vascular; **Pag. 2-3 din Vivid S70N product datasheet Rel 6.0 – *Probe Presets***
PORTURI PENTRU TRADUCTOARE ACTIVE 4;	**DA** PORTURI PENTRU TRADUCTOARE ACTIVE **5 pag. 2 din Vivid S70N product datasheet Rel 6.0 – *Console Design***;
PORT CW (minim): 1;	**DA** PORT CW: 1; **DA CW port mai este denumit Doppler Pencil Probe Connector pag.81/3-9 din Vivid S70N / S60N – User Manual**
NIVELE DE GRI (minim): 256;	**DA** NIVELE DE GRI : 256; **pag.**
RATA DE CADRE ASIGURATĂ DE DISPOZITIV (minim): 2000 fps	**DA** RATA DE CADRE ASIGURATĂ DE DISPOZITIV : 3000 fps **pag. 7 din Vivid S70N product datasheet Rel 6.0**
GAMA DINAMICĂ A SISTEMULUI (minim): 250dB;	**DA** GAMA DINAMICĂ A SISTEMULUI: 450dB; **este prezentă tehnologi infina de nivele pag. 7 din Vivid S70N product datasheet Rel 6.0**
CANALE PREPROCESARE (minim): 6 000 000 (digitale) / 512 (fizice) ;	**DA** CANALE DIGITALE PREPROCESARE (minim): 6 000 000; **este prezentă tehnologia numar infinit de canale efective pag. 7 din Vivid S70N product datasheet Rel 6.0**
ADÂNCIME DE SCANARE (minim): 40 cm;	**DA** ADÂNCIME DE SCANARE: **50 cm; pag. 7 din Vivid S70N product datasheet Rel 6.0**
DIAPAZON FRECVENȚĂ ASIGURATĂ DE DISPOZITIV 1-20 MHz (minim);	**DA** DIAPAZON FRECVENȚĂ ASIGURATĂ DE DISPOZITIV 1-25 MHz; **pag. 5 din Vivid S70N product datasheet Rel 6.0**
"TRADUCTOARELE ACCEPTATE DE SISTEM: matricial sectorial, matricial convex, matricial liniar, matricial intra-operațional, CW pencil, TEE, TEE volumetric 4D, single cristal (monocristal)."	TRADUCTOARELE ACCEPTATE DE SISTEM: matriciale **ML6-15-D**, convexe **C1-5-D**, TEE **6VT-D, 6Tc-RS, 9T-RS, 10T-D**, intra-operaționale **L8-18i-D**, sectoriale **6S-D, 12S-D** , volumetrice 4D **6VT-D**, CW pencil **P2D, P6D**, monocristal-**XDClear C1-6-D, C2-9-D, C3-10-D, M5Sc-D**; **din Vivid S70N Ultra Edition Probe guide.**
Număr frecvențe emise de un traductor ≥ 8;	**DA** Număr frecvențe emise de un traductor minim 8; **Exemplu ML6-15-D fregventa 4.5-15.0 MHz din Vivid S70N Ultra Edition Probe guide**
Moduri de imagistică:	Moduri de imagistică: **pag. 3 din Vivid S70N product datasheet Rel 6.0**
2D sau B-mod;	2D sau B-mod; **DA 2D Tissue**
M-mod;	M-mod; **DA Tissue M-Mode**
M-mode anatomic sau analog;	M-mode anatomic; **DA Anatomical M-mode**
Color M-mod;	Color M-mod; **DA Color M-mode**
Tissue harmonic imaging sau analog;	Tissue harmonic imaging; **DA pag. 7 din Vivid S70N product datasheet Rel 6.0**
Prezentarea listei de regimuri în care se pot combina 2 moduri/Duplex (Exemplu 2D+M-mod) concomitent;	**DA** Prezentarea listei de regimuri în care se pot combina 2 moduri/Duplex (Exemplu 2D+M-mod) concomitent; **pag. 4 din Vivid S70N product datasheet Rel 6.0**

Anexa 33

Prezentarea listei de regimuri în care se pot combina 3 moduri/ triplex (Exemplu 2D + Tri-plane + CFM);	**DA** Prezentarea listei de regimuri în care se pot combina 3 moduri/ triplex (Exemplu 2D + Tri-plane + CFM); **pag. 4 din Vivid S70N product datasheet Rel 6.0**
DOPPLER :	DOPPLER :
CW (doppler continu);	CW (doppler continu); **DA Continuous wave Doppler pag. 3 din Vivid S70N product datasheet Rel 6.0**
PW (doppler pulsativ) ;	PW (doppler pulsativ) ; **DA Pulsed wave Doppler pag. 3 din Vivid S70N product datasheet Rel 6.0**
CF-mode (doppler color);	CF-mode (doppler color); **DA 2D color flow pag. 3 din Vivid S70N product datasheet Rel 6.0**
Doppler tisular (TVD/TDI);	TVD - Doppler tisular; **DA Tissue velocity Doppler pag. 3 din Vivid S70N product datasheet Rel 6.0**
HPRF- cu posibilitate de control.	**DA** HPRF- cu posibilitate de control. **10 din Vivid S70N product datasheet Rel 6.0**
FUNCŢIONALITĂŢI:	FUNCŢIONALITĂŢI:
În regimul Doppler să fie afișată viteza și frecvența;	**DA** În regimul Doppler să fie afișată viteza și frecvența; **pag. 160-161/5-12 – 5-13 din Vivid S70N / S60N – User Manual *viteza este în corespondeță***
Măsurători pe imagini statice și salvate;	**DA** Măsurători pe imagini statice și salvate; **pag. 5, 11 -12 din Vivid S70N product datasheet Rel 6.0**
Diapazon dinamic selectabil;	**DA** Diapazon dinamic selectabil; **pag. 7 din Vivid S70N product datasheet Rel 6.0**
Tehnologii de îmbunătățire în timp real a clarității imaginii (cSound/iBeam/nSIGHT Plus/ analogic).	**DA** Tehnologii de îmbunătățire în timp real a clarității imaginii (**cSound**/iBeam/nSIGHT Plus/ analogic). **pag. 1 din Vivid S70N product datasheet Rel 6.0**
Măsurători pe reluarea video;	**DA** Măsurători pe reluarea video; **pag. 5 din Vivid S70N product datasheet Rel 6.0 - *Measurements/calculations and annotations on cine playback***
Rotirea imaginei 0° și 180°;	**DA** Rotirea imaginei 0° și 180°; **pag. 7 din Vivid S70N product datasheet Rel 6.0**
Reverse stânga - dreapta;	**DA** Reveres stânga - dreapta; **pag. 7 din Vivid S70N product datasheet Rel 6.0**
Regim Automat de optimizarea a imaginei;	**DA** Regim Automat de optimizarea a imaginei 2D si CF si PW; **pag. 7, 11 din Vivid S70N product datasheet Rel 6.0**
	DA Calcule care sunt indexate cu suprafața corporală a pacientului; **toate măsurătorile care sînt indexate cu suprafața corporală a pacientului prmiște adăugător abriviatură Mass Index Ex: LVd Mass Index pag. 15 din Vivid S70N product datasheet Rel 6.0**
Zoom de înalta definiție;	**DA** Zoom de înalta definiție; **pag. 7 din Vivid S70N product datasheet Rel 6.0**
Regim calcul automat a fracție de ejecție in regim 2D;	**DA** Regim calcul automat a fracție de ejecție in regim 2D; **pag. 13 din Vivid S70N product datasheet Rel 6.0**
	DA Regim calcul automat a grosimii vasului; **pag. 12 din Vivid S70N product datasheet Rel 6.0**
Tehnologie ce calculează și codifică color deplasările și diferențele de viteze într-un interval de timp determinat ce are loc în timpul sistolei;	**DA** Tehnologie ce calculează și codifică color deplasările și diferențele de viteze într-un interval de timp determinat ce are loc în timpul sistolei; **pag. 10 din Vivid S70N product datasheet Rel 6.0 – *Tissue Tracking Mode TSI***
Să ofere analize cantitative a curbelor de velocitate și a parametrilor derivați (strain, rata de deformare a țesutului cardiac) a unei regiuni de interes;	**DA** Să ofere analiză cantitativă a curbelor de velocitate și a parametrilor derivați (străin, rata de deformare a țesutului cardiac) a unei regiuni de interes; **pag. 12 din**

Anexa 33

	Vivid S70N product datasheet Rel 6.0 – *Quantitative Analysis Package (Q-Analysis)*
Dispune de pachet complet ce oferă analiza cantitativă a curbelor de întârziere a mișcării peretelui cardiac, imagistica deformării 2D și rata de deformare a țesutului cardiac;	**DA** Dispune de pachet complet ce oferă analiza cantitativă a curbelor de întârziere a mișcării peretelui cardiac, imagistica deformării 2D și rata de deformare a țesutului cardiac; **pag. 10 din Vivid S70N product datasheet Rel 6.0 – *Tissue Synchronization Imaging Mode***
Dispune de mod de analiza calitativa ce permite evaluarea proprietăților funcționale de deformare ale țesuturilor cordului;	**DA** Dispune de mod de analiza calitativa ce permite evaluarea proprietăților funcționale de deformare ale țesuturilor cordului;**pag. 10 din Vivid S70N product datasheet Rel 6.0 - *Tissue deformation (strain) and rate of deformation (strain rate) are calculated and displayed as real-time, color-coded overlay on the 2D image, Cine compound calculates and displays cineloops generated from a temporal averaging of multiple consecutive heart cycles***
Dispune de mod ce analizează prin codare color, rata deformării tisulare in timp real;	**DA** Dispune de mod ce analizează prin codare color, rata deformării tisulare in timp real; **pag. 10 din Vivid S70N product datasheet Rel 6.0 - *Strain/Strain Rate Mode (option, enabled by Advanced QScan***
Dispune de modul automat pentru obținerea datelor de interes pentru ventriculul drept precum deformarea globală, segmentară și calculul TAPSE în examinările trans-toracice;	**DA** Dispune de modul automat pentru obținerea datelor de interes pentru ventriculul drept precum deformarea globală, segmentară și calculul TAPSE în examinările transtoracice; **pag. 13 din Vivid S70N product datasheet Rel 6.0 - *Automated Function Imaging for the Right Ventricle***
Dispune de modul automat pentru obținerea datelor de interes pentru atriul stâng precum deformarea globală și fracția de golire pentru atriul stâng;	Dispune de modul automat pentru obținerea datelor de interes pentru atriul stâng precum deformarea globală și fracția de golire pentru atriul stâng; **pag. 13 din Vivid S70N product datasheet Rel 6.0 - *Automated Function Imaging for the Right Ventricle***
Dispune de instrumente de calcul semi-automat bazat pe inteligență artificială pentru recunoașterea și efectuarea automata a măsurătorilor uzuale pentru examinările cardiace și vasculare.	**DA** Dispune de instrumente de calcul semi-automat bazat pe inteligență artificială pentru recunoașterea și efectuarea automata a măsurătorilor uzuale pentru examinările cardiace și vasculare. **pag. 1 din Vivid S70N product datasheet Rel 6.0 - *AI Auto Measure – Spectrum Recognition***
Dispune de pachet complet de măsurare automata a fracției de ejecție a ventriculului stâng.	**DA** Dispune de pachet complet de măsurare automata a fracției de ejecție a ventriculului stâng. **pag. 8 din Vivid S70N Product Tree - *Auto EF 3.0 and AFI 3.0 bundle***
"B-flow sau analogic. Pentru studiul și analiza stenozelor vasculare, hematoamelor, trombozelor, fistulei AV, activității nodulilor, perfuziei renale, morfologiei plăgilor arteriale, turbulențelor arterei carotide și a eventualelor sinoase, diferențierii vaselor cu fluxuri mici, tiroida etc."	**DA** "**B-flow** . Pentru studiul și analiza stenozelor vasculare, hematoamelor, trombozelor, fistulei AV, activității nodulilor, perfuziei renale, morfologiei plăgilor arteriale, turbulențelor arterei carotide și a eventualelor sinoase, diferențierii vaselor cu fluxuri mici, tiroida etc. **B-Flow pag. 10 din Vivid S70N product datasheet Rel 6.0**
Controlul imaginei CINE: În secunde conform barei de memorare cine;	Controlul imaginei CINE: În secunde conform barei de memorare cine;**DA pag. 637/12-21 din Vivid S70N / S60N – User Manual - *Cineloop store***
Pe numărul de cicluri ECG.	Pe numărul de cicluri ECG. **DA pag. 637/12-21 din Vivid S70N / S60N – User Manual - *Cineloop store***

Anexa 33

Prezența tabelului sumar cu toate măsurările făcute în regim 2D, M-mode, CW, PW si altele.	**DA** Prezența tabelului sumar cu toate măsurările făcute în regim 2D, M-mode, CW, PW si altele. **pag. 457/8-149 din Vivid S70N / S60N – User Manual - *WORKSHEEET***
Baza de date a pacienților și posibilitatea de a: Introduce pacient nou;	Baza de date a pacienților și posibilitatea de a: **DA** Introduce pacient nou; **pag.493/10-3, 505/10-15 din Vivid S70N / S60N – User Manual– *LocalArchive - Int.HD***
Introduce noi investigații pentru pacientul existent;	**DA** Introduce noi investigații pentru pacientul existent; **pag. 505/10-15 din Vivid S70N / S60N – User Manual - *Retrieving and editing archived information***
Posibilitatea de vizualizarea a rezultatelor investigațiilor precedente;	**DA** Posibilitatea de vizualizarea a rezultatelor investigațiilor precedente; **pag. 508/10-18, 520/10-30 din Vivid S70N / S60N – User Manual - *Figure 10-7. Si Figure 10-15***
Transfer date pacient pe spațiu de stocare extern (USB) sau server local.	**DA** Transfer date pacient pe spațiu de stocare extern (USB) sau server local. **pag.531-533/ 10-41; 10-43 din Vivid S70N / S60N – User Manual– *Archiving and Transfer of patient records/examinations***
FUNCȚII OPȚIONALE (care pot fi instalate/procurate ulterior): Stress echo.	FUNCȚII OPȚIONALE (care pot fi instalate/procurate ulterior): **Da** Stress echo. **pag. 2, 3, 18 din Vivid S70N product datasheet Rel 6.0**
3D în timp real (4D-mod).	3D în timp real (4D-mod). **DA Vivid S70N product datasheet Rel 6.0**
Dispune de mod de lucru ce permite achiziția a trei planuri simultane ale aceluiași ciclu cardiac ce sunt capabile sa genereze un afișaj tip "Bull's-eye" împreună cu măsurători cantitative și mapări ale suprafeței;"	**DA** Dispune de mod de lucru ce permite achiziția a trei planuri simultane ale aceluiași ciclu cardiac ce sunt capabile sa genereze un afișaj tip "Bull's-eye" împreună cu măsurători cantitative și mapari ale suprafeței; **pag. 10 din Vivid S70N product datasheet Rel 6.0 – *Waveform trace available to obtain quantitative time to peak measurement from TSI Image, Available in live scanning, as well as an offline calculation derived from tissue Doppler data, Efficient segment specific TSI time measurements, Immediate bulls-eye report, Automatic calculated TSI synchrony indexes, TSI surface mapping, Simultaneous acquisition of tri-plane TSI images covering all standard segments in apical views***
Dispune de instrument specializat ce permite vizualizarea în 3D/4D a valvei mitrale si calcule automate/ semiautomate a funcției acesteia pentru apreciere chirurgicală."	**DA** Dispune de instrument specializat ce permite vizualizarea în 3D/4D a valvei mitrale si calcule automate/ semiautomate a funcției acesteia pentru apreciere chirurgicală." **pag. 3, 8, 12 din Vivid S70N product datasheet Rel 6.0 – 4D Features, 4D Mode, 4D Auto MVQ**
"Dispune de instrumente analiza valvă aortică pentru intervenții TAVI"	**DA** "Dispune de instrumente analiza valvă aortică pentru intervenții TAVI" **pag. 12 din Vivid S70N product datasheet Rel 6.0 – 4D Auto AVQ**
Dispune de funcție pentru măsurare semi-automată a volumului ventriculului stâng și a fracției de ejecție. De asemenea să poată afișa și semnalul electric al ventriculului stâng pentru un întreg ciclu cardiac; Dispune de modul de ecocardiografie de contrast pentru examinarea ventriculului stâng;	**DA** Dispune de funcție pentru măsurare semi-automată a volumului ventriculului stâng și a fracției de ejecție. De asemenea să poată afișa și semnalul electric al ventriculului stâng pentru un întreg ciclu cardiac; Dispune de modul de ecocardiografie de contrast pentru examinarea ventriculului stâng; **pag. 12 din Vivid S70N product datasheet Rel 6.0 – 4D Auto LVQ** **DA** Dispune de modalitate de scanare cu două sau trei planuri simultane în care unul din ele poate fi rotit și

Anexa 33

Dispune de modalitate de scanare cu două sau trei planuri simultane în care unul din ele poate fi rotit și înclinat în orice direcție; Doppler Color 3D/4D Prezența comunicării cu un sistem de fluoroscopie continu pe ecranul ecografului ca model imagine in imagine pentru vedere in timp real. Vizualizarea pe PC pe investigațiilor efectuate. Utilizarea stației de lucru externe cu același tip de bază de date a pacienților. Calcularea automată a grosimii intimei media din zona de interes. PACHETE DE ANALIZĂ(minim necesare): Cardiac; Vascular; PAN/ZOOM: imagine în timp real; imagine înghețată. Spațiul de stocare (minim): 500 GB; Memorie CINE (minim): 900 MB sau 2000 cadre în modul duplex (2D/ B-mode + Doppler Color) sau 20 secunde ciclu în 4D ; Porturi de extensie USB; Modul ECG integrat. Imprimantă incorporată. TRADUCTOARE NECESARE MĂSURĂRILOR ENUMERATE CU DIAPAZONUL MINIM: Sectorial matricial 1.8 MHz - 4.5 MHz, unghiul de scanare minim 90 ° - 1 unitate; Ultrasonograful livrat să fie setat pentru lucru cu traductoarele livrate; MONITOR minim 21,5 inch cu braț articulat, ce permite mișcarea stânga, dreapta, sus, jos și sistem de blocare la transportare.	înclinat în orice direcție**; pag. 8 – 9 din Vivid S70N product datasheet Rel 6.0 – Multi-Dimensional Mode** **DA** Doppler Color 3D/4D **pag. 9 din Vivid S70N product datasheet Rel 6.0 – 4D Color Doppler Imaging** **DA** Prezența comunicării cu un sistem de fluroscopie continu pe ecranul ecografului ca model imagine in imagine pentru vedere in timp real. **pag. 6 din Vivid S70N product datasheet Rel 6.0 - *View-X (optional)*** **DA** Vizualizarea pe PC pe investigațiilor efectuate. **pag. 6 din Vivid S70N product datasheet Rel 6.0 - *Self-contained DICOM Viewwe (optional)*** **DA** Utilizarea stației de lucru externe cu același tip de bază de date a pacienților. **pag. 526-528/10-36; 10-38 din Vivid S70N / S60N – User Manual** **DA** Calcularea automată a grosimii intimei media din zona de interes. **pag. 12 din Vivid S70N product datasheet Rel 6.0 – *Intima Media Thickness (IMT)*** PACHETE DE ANALIZĂ(minim necesare): **DA** Cardiac; **pag. 2, 14 din Vivid S70N product datasheet** **DA** Vascular; **pag. 2-3 din Vivid S70N product datasheet Rel 6.0** PAN/ZOOM: **DA** imagine în timp real; **pag. 135/4-9 din Vivid S70N / S60N – User Manual** **DA** imagine înghețată. **pag.138/4-12 din Vivid S70N / S60N – User Manual** **DA** Spațiul de stocare: 500 GB; **pag. 5 din Vivid S70N product datasheet Rel 6.0 – *Hard drive image storage: 0.5 TB – 500 GB*** **DA** Memorie CINE : 1 GB; **pag. 5 din Vivid S70N product datasheet Rel 6.0 – *1 GB of cine memory stores*** **DA** Porturi de extensie : 2 USB; **pag. 81, 91/3-9, 3-19 din Vivid S70N / S60N – User Manual** **DA** Modul ECG integrat. **pag. 2 din Vivid S70N product datasheet Rel 6.0** **DA** Imprimantă incorporată. **pag. 2 din Vivid S70N product datasheet Rel 6.0** TRADUCTOARE NECESARE MĂSURĂRILOR ENUMERATE CU DIAPAZONUL MINIM: Sectorial **Model: M5Sc-D 1.5 MHz - 4.6 MHz**, unghiul de scanare **120 °** - 1 unitate; **pag. 2 din Vivid™ S70N Ultra Edition Probe guide** Ultrasonograful livrat să fie setat pentru lucru cu traductoarele livrate; **DA va fi setat si complet luctrativ pentru traductorele livrate** **DA** MONITOR - 21,5 inch cu braț articulat, ce permite mișcarea stânga, dreapta, sus, jos și sistem de blocare la transportare. **pag. 2 din Vivid S70N product datasheet Rel 6.0;** **pag. 118/3-46; din Vivid S70N / S60N – User Manual**

Anexa 33

Pentru siguranța și mobilitatea echipamentului ce va fi utilizat atât în sălile de intervenție cât și în terapii intensive.	**DA** Pentru siguranța și mobilitatea echipamentului ce va fi utilizat atât în sălile de intervenție cât și în terapii intensive.
Panel de control tactil minim 12 inch.	**DA**Panel de control tactil 12 inch. – **pag. 2 din Vivid S70N product datasheet Rel 6.0**
Baterie incorporată pentru menținerea sistemul neîntrerupt de la un pacient la altul	**DA**Baterie incorporată pentru menținerea sistemul neîntrerupt de la un pacient la altul , **cu durata de lucru 20 min**. **pag. 2 din Vivid S70N product datasheet Rel 6.0 - *Uninterruptible Power Supply***
Imprimanta termica alb/negru – 1buc;	**DA** Imprimanta termica alb/negru – 1buc; **pag. 2 din Vivid S70N product datasheet Rel 6.0 – *On-oard storage for B/W thermal printer*** **Pag. 10 din Product Tree Vivid S70N - *Sony UP-D898MD***
TROLIU:	TROLIU:
4 roti , minim 2 blocabile;	**DA** 4 roti , 3 blocabile; **pag. 2 din Product Tree Vivid S70N - *Four swivel wheels – three wheel brakes, one wheel direction lock.***
să permită ridicarea și coborârea panelului de control de un sistem hidraulic sau pneumatic;	**DA** să permită ridicarea și coborârea panelului de control de un sistem hidraulic sau pneumatic; **pag. 2 din Product Tree Vivid S70N - *Ergonomic FlexFit design with left/right swivel and up/down arm-mobility of keyboard and monitor permitting both physiological sitting or standing operation*** **pag. 8-124 din VIVID S60N/VIVID S70N BASIC SERVICE MANUAL - *8-7-4 Swivel and Up-Down Handle Replacement Procedure*** **Control prin sistem hidraulic.**
să permită rotirea stânga/dreapta fără a fi mișcarea bazei;	**DA** să permită rotirea stânga/dreapta fără a fi mișcarea bazei; **pag. 2 din Product Tree Vivid S70N - *Ergonomic FlexFit design with left/right swivel and up/down arm-mobility of keyboard and monitor permitting both physiological sitting or standing operation***
Alimentare curent alternativ 220V, 50Hz.	**DA** Alimentare curent alternativ **100-240 V, 50/60Hz**. **pag. 2 din Product Tree Vivid S70N - *Nominal input voltage: 100-240 VAC, 50/60 Hz***
ACCESORII:	ACCESORII:
Cablu pacient ECG Adult 3 derivații – 1 unitate;	Cablu pacient ECG Adult 3 derivații – 1 unitate; **DA inclus**
Daca necesită cablu de interconectare modulul ECG cu cablu pacient Adult și Copil să se livreze 1 unitate.	Daca necesită cablu de interconectare modulul ECG cu cablu pacient Adult și Copil să se livreze 1 unitate. **DA inclus.**
Terminul de garanție minim 36 luni (asigurat de agentul economic sau producător).	**DA** Terminul de garanție 36 luni (asigurat de agentul economic sau de producător).

GE Healthcare

Vivid S70N

Version 206

Datasheet

Product Description

The Vivid™ S70N combines the proven breadth, quality and performance of the Vivid product line with a new and innovative software image processing platform: cSound™ The Vivid S70N is GE Healthcare (GEHC) cardiovascular ultrasound's high-end scanner.

The cSound architecture benefits all Vivid S70N probes and applications. The Vivid S70N supports the following applications: Fetal/Obstetrics, Abdominal (including renal, GYN), Thoracic/Pleural, Pediatric, Small Organ (breast, testes, thyroid), Neonatal Cephalic, Adult Cephalic, Cardiac (adult and pediatric), Peripheral Vascular, Musculo-skeletal Conventional, Musculo-skeletal Superficial, Urology (including prostate), Transvaginal Transesophageal, , Transrectal, Intracardiac and Intra-luminal, Interventional Guidance (including Biopsy, Vascular Access), and Intraoperative (vascular).

System Architecture

GE Healthcare's exclusive, programmable, and flexible software beamforming technology, cSound, provides exceptional image quality and power compared to conventional hardware-based beam forming technology. In 2D, cSound offers true confocal imaging without the limitation of focal zones or sacrifice of frame rate and spatial resolution. In 4D, cSound delivers volume sizes suited for full volume single-beat and multi-beat 4D acquisition (optional). Using both coherent and harmonic image processing, the system provides computational power, ease of imaging, workflow flexibility and product upgradeability.

The Vivid S70N excels in the following areas:

Exceptional image quality on the Vivid S70N is created through the use of True Confocal Imaging. The technique is enabled by the cSound platform taking advantage of advanced software image reconstruction and state-of-the-art graphics computer technology. The Vivid S70N combines Ultra Definition Clarity filtering, elevation compound imaging (considering a wider slice for 2D imaging) with the 6VT-D probe and 4Vc-D probe, HD Imaging (balanced resolution, penetration and image uniformity), virtual convex (wider field-of-view in the far field) for the linear probes and virtual apex (larger field-of-view) for the FPA probes.

Probe Technology – The XDclear™ series of probes are designed to help deliver powerful and efficient sound waves, with high bandwidth and efficiency. XDclear probe technology provides impressive deep penetration and high sensitivity while maintaining high spatial resolution. The combination of Single Crystal, Acoustic Amplifier and Cool Stack technologies is the core technology of the XDclear series of probes.

Ease of use features make Vivid S70N an extremely productive 2D and 4D cardiovascular ultrasound system.

The combination of the touch screen control with conventional (tactile) buttons provides intuitive controls, helping the operator maintain focus on the patient and the ultrasound images during the exam. The touch screen can also provide alpha-numeric (A/N) keyboard entry or a dedicated A/N keyboard option can be purchased.

Ease of use for the operator in 2D imaging is provided by the cSound technology delivering auto optimized excellent image quality with little manipulation along with automated tools like 2D AutoEF 3.0 with AI-based View Recognition, Easy AutoEF, AFI 3.0 Productivity Package with AI-based View Recognition, AFI for RV, AFI for LA, Easy AFI LV, Cardiac Auto Doppler with AI Auto Measure – Spectrum Recognition, AI Auto Measure – 2D, and Scan Assist Pro.

Ease of use in 4D imaging is accomplished with a number of GEHC innovations, including Single Beat 4D, 4D visualization and navigation toolbox including FlexiSlice, FlexiViews, 4D Markers, View-X and advanced 4D chamber and value quantification packages including 4D Auto LVQ, 4D Auto RVQ, 4D Auto MVQ, 4D Auto AVQ.

Ergonomic features include the "Flex Fit" mechanism enabling continuous pivoting height adjustment of the control panel, allowing the user to adjust distance to the control panel while providing the adequate legroom for standing or sitting positions. In addition, the articulating monitor arm (horizontal and vertical), and lightweight transducers combine to make the Vivid S70N an extremely ergonomic-friendly cardio- vascular ultrasound system.

Portability – The Vivid S70N's compact size and light weight, combined with a fold-down monitor, enables easy transportation and promotes scanning at the patient site. The battery option provides a transportation mode that keeps the system ready to scan within a few seconds of being connected to a power outlet.

The cSound platform takes GE Healthcare's **Raw Data** to a new level. For image processing and reconstruction, the Vivid S70N utilizes more than 100 times the data compared to the Vivid S6.

Additionally, the Vivid S70N uses the proven Raw data format technology that allows for advanced processing on archived images by applying many of the same scan controls and **advanced quantitative tools** as are available during the original exam

General Specifications

Dimensions and Weight

- Width: 54 cm, 21.4"
- Depth: 76 cm, 30.2"
- Height: 132 cm – 167 cm, 52.0" – 65.7"
- Minimum height with folded screen: 118 cm, 46"
- Weight: <73 kg, 161 lbs

Electrical Power

- Nominal input voltage: 100-240 VAC, 50/60 Hz
- Rated power consumption: 500 VA

Operating System

- Windows® 10

Uninterruptible Power Supply (optional)

- Battery backup for standby
- In case of power failure or accidental shutdown, when power is restored within less than 20 minutes, the system automatically turns on instantly, maintaining exact system state prior to shutdown
- For longer power interrupts periods, system automatically saves data and changes into "Standby" state

Console Design

- Five active probe ports
- ECG port
- Integrated 1TB HDD
- Multiple USB ports (front/back)
- Integrated DVD-R multi drive (optional)
- On-board storage for B/W thermal printer
- Integrated speakers for premium sound
- Four swivel wheels – three wheels brakes, one wheel direction lock
- Integrated cable management
- Easily accessible removable air filters for cleaning
- Front and rear handles
- Rear storage trays/baskets
- Hand rest

Eco Friendly Design

- Vivid S70N offers an inverted B&W background printing, helping to prevent waste of ink and paper
- eDelivery remote software update solution helps decrease use of hardware drivers and decrease our service field engineers carbon emission footprint.

User Interface

Operator Keyboard

- Ergonomic Flex Fit design with left/right swivel and up/down arm-mobility of keyboard and
- Monitor permitting both physiological sitting or standing operation
- Touch keyboard with support for characters in 12 languages
- Drawer type A/N keyboard (optional)
- Physical keyboard support for international characters in 7 languages (optional)
- Ergonomic hard key layout
- Interactive backlighting of application-specific push buttons – adjustable back-light intensity
- Integrated gel holders
- Easy-to-learn user interface with intelligent keyboard
- Dedicated rotary for overall gain for 2D-mode
- Dedicated gain rotary for M-mode, CFM or Doppler controlled by active mode
- Image manager on the touch screen for quick review of image clipboard contents and easy export of images and loops to remote archives or media

Touch Screen

- 12" ultra-high-resolution, wide screen format, color, multi-touch LCD screen
- Interactive user-configurable dynamic software menu
- Touch-panel control of 8 TGC sliders
- Touch-panel controls content can be set to routine or extended usage
- Display of live ultrasound images on the touch screen (Image View)

LCD Monitor

- 22" wide screen, High-Definition (HD), flicker-free LCD display
- 256 shades of gray and 16.7 million simultaneous colors available
- Articulated monitor arm
- LCD translation (independent of console)
  - 350 mm horizontal bidirectional
  - 150 mm vertical height adjustment
  - Swivel to any viewing direction
- Fold down and rotation lock mechanism for transportation
- Horizontal viewing angle of more than 170°
- Resolution: 1920 x 1080 pixels
- Contrast Ratio 1,000:1
- Manual backlight and digital brightness and contrast adjustment for excellent

viewing in different ambient light conditions
- Tint adjustments
- Separate adjustment for external monitor brightness/contrast
- Adaptive video formats and resolution for external monitor
- Selection for screen area output to external monitor
- Streaming (optional) sends the image information as digital video stream over ethernet in real-time to clients

System Overview

Probe Presets

- Cardiac
- Stress (optional)
- Abdominal
- Peripheral vascular
- Fetal heart
- Pediatrics
- Neonatal cephalic
- Adult cephalic
- Small parts
- Thyroid
- Musculoskeletal
- Urology
- Transesophageal
- OB/GYN
- Intracardiac
- Intraoperative
- Coronary (part of QuickApps)
- LV Contrast (accessed through QuickApps)
- Advanced Contrast (optional)
- Vascular/Abdominal Contrast (optional)
- Nerves
- Lungs

Operating Modes

- 2D tissue
- 4D tissue (optional)
- 2D color flow
- 4D color flow (optional)
- 2D angio flow
- Color M-mode
- Tissue velocity M-mode
- Continuous wave Doppler
- Tissue M-mode
- Pulsed wave Doppler
- Anatomical M-mode
- Curved anatomical M-mode
- Tissue velocity imaging
- Tissue tracking
- Tissue synchronization imaging
- Strain imaging
- Strain rate imaging
- Tissue velocity Doppler
- Blood flow imaging
- B-flow
- 2D stress (optional)
- Strain Elastography
- AFI Automated Function Imaging (optional)
- AutoEF (optional)
- 2D virtual apex imaging
- Bi-plane
- Tri-plane
- Bi- and Tri-plane with color
- Coded phase inversion
- Compound imaging
- Extended field-of-view (LOGIQ™ View)
- 4D TEE full-volume scanning – single beat and multi beat (optional)

Scanning Methods

- Electronic sector
- Electronic volume (optional)
- Electronic convex
- Electronic linear
- CW pencil

Transducer Types

- Sector phased array
- Convex array
- Linear array
- Single crystal matrix array
- 2D matrix array

Bi-plane/Tri-plane Features

- Bi-plane acquisition includes tilt and rotate
- Tri-plane acquisition
- Multi-dimensional (bi-plane/tri-plane) Color and TVI acquisition
- QuickRotate/Rotate

4D Features

(available with 4D probes 6VT-D and 4D ICE and the 4D option)

- Single, dual or multiple cycle volume acquisition
- FlexiSlice with depth mode
- 2 Click crop
- Flip crop
- View crop
- Dynamic view crop
- Dual crop
- FlexiZoom
- Laser lines
- Depth color render
- Automated 4D left ventricular quantification (LV volume and EF)
- FlexiViews
- Dynamic multi-slice views
- Live multi-slice views
- Dynamic crop
- Measurement on render

Optional 4D Features

- 4D Auto MVQ
- 4D Auto AVQ
- 4D Auto RVQ
- HD Color
- 4D Markers
- View-X

Peripheral Options

Internal peripherals

- USB B/W video printer with control from system (optional)

External peripherals

- Network printers
  - Color laser printer
  - Color video printer with control from system
- Encrypted USB memory stick
- Three-pedal configurable footswitch

External outputs

- DVI-D

- Ethernet – 10 Mbps, 100 Mbps, 1 Gbps electrically isolated
- Multiple USB 2.0 ports, one of them isolated

Accessories (optional)

- Interface cable for external ECG and external respiratory
- ECG adapter for DIN-type pediatrics electrode leads
- Cable storage box

Display Modes

- Live and stored display format: Full size and split screen, both with thumbnails, for still and cine
- Instant-review screen displays 12 simultaneous loops/images for a quick study review
- Selectable display configuration of duplex and triplex modes: Side-by- side or top-bottom during live, digital replay and clipboard image recall
- Single, dual and quad-screen view
- Simultaneous capability
  - 2D + PW/CW
  - 2D + CFM/TVI + PW
  - 2D + CFM + CW
  - 2D + CFM/Angio/TVI/SRI/TT/SI/TSI
  - 2D + M/AMM/CAMM
  - 2D + CFM/Angio/TVI/SRI/TT/SI/TSI + M/AMM/CAMM
  - Real-time duplex or triplex mode
  - Compound + M/CFM/PW
  - 4D + CFM (Optional with 4D probes 6VT-D and 4D ICE and respective software licenses)
  - 2D + Bi-plane
  - 2D + Bi-plane + CFM/TVI/SRI/TT/ SI/TSI/AMM/ CAMM
  - 2D + Tri-plane
  - 2D + Tri-plane + CFM/TVI/SRI/TT/ SI/ TSI/AMM/CAMM
  - 2D + color split screen (simultaneous mode)
- Selectable alternating modes
  - 2D or Compound + PW
  - 2D + CW
  - 2D or Compound + CFM/PW
  - 2D + CFM + CW
- Multi-image (split/quad screen)
  - Live and/or frozen
  - Independent cine playback
- Timeline display
  - Independent 2D (or Compound) + PW/CW/M display
  - A choice of display formats with various sizes of 2D + PW/CW/M
- Top/bottom selectable format
- Side/side selectable format
- 4D display

  (Optional with 4D probes 6VT-D and 4D ICE and respective software licenses)
  - Two + one slice and render view
  - Quad view (three slice and render)
  - Single render view
  - Slice-only view
  - Live multi-slice
  - FlexiSlice (live and replay)
  - Bi-plane side/side view
  - Tri-plane view (quad including geometry viewer)
  - Crop view (three orthogonal slice + render)
  - Apical slice view (three 60° view + render)
  - Cine rotate render view
  - Bi-plane prepare (two slice + render)

Display Annotation

- Patient name: First, last and middle
- Patient ID
- Additional patient ID
- Age, sex and birth date
- Hospital name
- Date format: Two types selectable – MM/DD/YY, DD/MM/YY
- Time format: Two types selectable – 24 hours, 12 hours
- Gestational age from LMP/EDD/GA
- Probe name
- Map names
- Probe orientation
- Depth scale marker
- Focal zone markers
- Image depth
- Zoom depth
- B-mode
  - Gain
  - Imaging frequency
  - Frame averaging
- M-mode
  - Gain
  - Frequency
  - Time scale
- Doppler mode
  - Gain
  - Angle
  - Sample volume size and position
  - Wall filter
  - Velocity and/or frequency scale
  - Spectrum inversion
- Time scale
  - PRF
  - Doppler frequency
- Color Flow Doppler mode
  - Frame rate
  - Sample volume size
  - Color scale
  - Power
  - Color baseline
  - Color threshold marker
  - Color gain
- Spectrum inversion
- Acoustic frame rate
- CINE indicator, image number/frame number
- Bodymarks: Multiple human anatomical structures
- Application/preset name
- Measurement results
- Operator message
- Displayed acoustic output
  - TIS: Thermal Index Soft Tissue
  - TIC: Thermal Index Cranial (Bone)
  - TIB: Thermal Index Bone
- MI: Mechanical Index
- Power output in dB
- Biopsy guideline and zone
- Heart rate
- Trackball-driven annotation arrows
- Active mode display

- Stress protocol parameters
- Parameter annotation follows ASE standard
- Free text with word library
- 4D slice intersection markers

  (Optional with 4D probes 6VT-D and 4D ICE and respective software licenses)
- 4D gauge

  (Optional with 4D probes 6VT-D and 4D ICE and respective software licenses)
- 4D markers
- 4D viewing angle arrows

  (Optional with 4D probes 6VT-D and 4D ICE and respective software licenses)
- 4D geometry viewer

  (Optional with 4D probes 6VT-D and 4D ICE and respective software licenses)
- 4D number of cycles

  (Optional with 4D probes 6VT-D and 4D ICE and respective software licenses)
- Scan plane position indicator and probe temperature are displayed with all TEE probes
- Image orientation marker

General System Parameters

System Setup

- Pre-programmable M&A and annotation categories
- Different user presets per probe/application may be stored for quick access
- User programmable preset capability with administrator preset protection
- QuickApps: Factory and user programmable sub-preset feature that keeps 2D and geometry settings while allowing different color flow or contrast parameters
- System frequency: 1 – 25 MHz
- Factory default preset data, protected against modification
- User Interface languages: English, LA Spanish, French, German, Italian, Portuguese (European and Brazilian), Russian, Swedish, Norwegian, Danish, Dutch, Finnish
- User-defined annotations
- Body patterns
- Customized comment home position

CINE Memory/Image Memory

- 1 GB of cine memory stores up to 800 s (175,000 frames) in 2D Color mode and up to 4,000 s in PW Doppler, depending on probe and settings
- Selectable cine sequence for cine review
- Measurements/calculations and annotations on cine playback
- Scrolling timeline memory
- Dual-image cine display
- Quad-image cine display
- CINE gauge and cine image number display
- CINE review loop
- CINE review speed

Image Storage

- 4D virtual store (Optional with 4D probes 6VT-D and 4D ICE and respective software licenses) for efficient 4D image management
- On-board database of patient information from past exams
- Compare old images with current exam
- Reload of archived data sets
- User-selectable ECG and time gated acquisition available on touch panel during live
- User-selectable prospective or retrospective capture in config
- Storage formats:
  - DICOM®-compressed or uncompressed, single/multi-frame, with/without raw data, storage via clipboard and/or seamlessly directly to destination device
  - Transfer/“Save As” JPEG, MPEG, AVI and VolDicom (Optional with 4D probes 6VT-D and 4D and respective software licenses), DICOM, Raw DICOM formats
- Storage devices:
  - USB memory stick
  - CD-RW storage: 700 MB
  - DVD storage: -R (4.7 GB)
  - Mobile hard drive storage: 0.5 TB
- Compare old images with current exam
- Reload of archived data sets
- Activation control of USB devices (for security)

Annotations

Body Marks

- Body mark icons for location and position of probe
- Option to automatically activate body mark on freeze
- Easy selection of body marks from touch screen
- Easy selection of body marks for dual-screen layout

Text Annotations

- Easy selection of text annotations from touch screen
- Option to automatically activate annotation on freeze

Connectivity and DICOM

- Ethernet network connection
- USB Wireless network connection kit (optional)
- DICOM
  - Verify
  - Print
  - Store
  - Modality worklist
  - Storage commitment
  - Modality Performed Procedure Step (MPPS)
  - DICOM spooler
  - DICOM Query/Retrieve
  - DICOM media exchange
- Support of two patient IDs in DICOM
- Separate DICOM SR and image storage destinations
- Simultaneous transfer of DICOM to multiple destinations
- Structured reporting – compatible with adult cardiac, pediatric, vascular and abdominal
- InSite™ ExC capability for remote service/access
- Streaming (optional) sends the image information as digital video stream over Ethernet in real-time to clients
- DICOM PDF Read
- DICOM / TLS (encryption)

- DICOM Implicit Encoding support

Patient Archive

EchoPAC™/Patient Archive

- Integrated EchoPAC functionality adds connectivity and image analysis capability to scanner
- Data format fully compatible with offline EchoPAC review/reporting stations of same or newer vintage
- Instant access to ultrasound raw data provided by the system
- Advanced post-processing analysis
- Three user levels help organizing data security requirements
- E-signoff compatibility, with clear indications in patient management screens and report screen that a report was signed off, and by whom and at what time. The signed off report and exam cannot be changed. The "Diagnosing Physician" field is automatically assigned to the user that did the sign-off

Image and Data Management

- Exceptional workflow with instant access data management
- DICOM 3.0 support – see DICOM conformance statement for details
- Support for transfer of the proprietary raw data files within the DICOM standard – configurable per mode and with the AI-based View Recognition in addition per view
- 2D, CFM or TVI data at maximum frame rate may be reviewed by scrolling or by running cine loops (cine memory can contain up to 175,000 images for imaging modes)
- Image clipboard for stamp-size storage and review of stored images and loops
- Built-in patient archive with images/loops, patient information, measurements and reports
- DICOM-SR Standard structured reporting mechanism
- Structured findings report tools help support efficient text entries with direct editing of findings text, usability enhancements, various configuration options and conclusion section
- User can enter normal values which are then compared to actual measurements
- Configurable HTML-based report function
- Report templates can be customized on board
- Reports can be printed, stored to archive and exported in PDF, CHM (Compiled HTML) and TXT format
- ASE-based default text modules (English), user-customizable
- Internal archive data can be exported to removable image storage through DICOM media
- Internal hard disk – for storing programs, application defaults, ultrasound images and patient archive
- All data storage is based on ultrasound raw data, allowing to change gain, baseline, color maps, sweep speeds, etc., for recalled images and loops
- DICOM media – read/write images on DICOM format
- DICOM viewer embedded on media (optional and selectable in Config)
- Alphanumeric data can be exported in Microsoft® Excel® compatible format
- JPEG export ("Save As") for still frames
- AVI and MPEG export ("Save As") for cineloops
- Specialized file format "Save As" VolDICOM feature to allow data import into TomTec Research Arena free-standing workstation (Optional with 4D probes 6VT-D and 4D ICE and respective software licenses)
- Ability to transfer Systole Only for stress echo loops to PACS
- Selectable raw data transfer to PACS including AI-based View Recognition for automatic view labelling

Self-contained DICOM Viewer (optional)

- Exams can be transferred to CD/DVD or USB media with an integrated GE Healthcare Ultrasound DICOM Viewer
- The GE Healthcare Ultrasound DICOM Viewer allows to open and display still images and cine loops from media on a standard PC, without installing any application on the host PC

Tricefy® Uplink (optional)[1]

- Can serve as long-term archive
- Can be used to share complete examinations with colleagues for information or collaboration
- Can be used to share images with patients

App Launchpad[1]

- Allows launching licensed applications ("Apps")
- Only validated and released apps are supported
- 3rd-party apps can be purchased and downloaded through an AppStore on a GE Healthcare website and then become available in the Launchpad

Raw Data Streaming (optional)

- Sends the image information as digital video stream over ethernet in real-time to clients
- Allows video transmission over long distances
- Supports 2D and 4D data for both tissue mode and color-flow mode
- Provides raw data images with metadata enabling clients to visualize (render), modify and process the Vivid S70N images through their own apps

Remote viewing (optional)

- Network based streaming of the screen of the Vivid console to a web-browser on a remote device (PC, MAC or pad)

User Manual Available on Board

Available through touch-panel utility page. User manual and service manual are included on a USB memory device

[1] *Tricefy and App Launchpad may not be available in all countries and regions. Consult with a GE Healthcare representative for more details.*

with each system. A printed user manual is provided for countries where required.

Scanning Parameters

- Infinite number of effective channels
- Minimum field-of-view range (depth): 0 – 2 cm (zoom) (probe dependent)
- Maximum field-of-view range (depth): 0 – 50 cm (probe dependent)
- Width range: 10 – 120 degrees
- Continuous dynamic receive focus/ continuous dynamic receive aperture
- Adjustable dynamic range, infinite upper level
- Image reverse: Right/Left
- Image rotation of 0°,180°

Tissue Imaging

General

- Variable transmit frequencies for resolution/penetration optimization
- Display zoom with zoom area control
- High-Resolution (HR) Zoom – concentrates all image acquisition power into selected Region of Interest (ROI)
- Variable contour filtering – for edge enhancement
- Depth range up to 50 cm – probe specific
- Selectable grayscale parameters: Gain, reject, DDP, clarity, dynamic range and compress – can be adjusted in live, digital replay and image clipboard recall (probe dependent)
- Automatically calculated TGC curves help reduce operator interaction
- Automatically calculated lateral gain

2D Mode

- Sector tilt and width control
- Frame rate in excess of 3,000 fps, depending on probe, settings and applications
- Coded octave imaging with coded phase inversion – GE Healthcare 3rd generation harmonic tissue imaging providing enhanced lateral and contrast resolution as compared to previous generation GE Healthcare products. Features help reduce noise, help improve wall definition, and axial resolution, making it well suited for a wide variety of patient groups
- True Confocal Imaging (TCI) – ultra narrow focused two-way beam profile throughout the field-of-view, maintaining frame rate, no zone stitching, no multi-line acquisition artifacts and enhanced dynamic contrast resolution throughout field- of-view compared to conventional focal imaging
- Automatic tissue optimization – single keystroke optimizes immediately automatically and dynamically different grayscale settings with the goal of signal independent uniform gain and contrast distribution
- UD Clarity and UD Speckle Reduction Imaging – an advanced image processing technique to help reduce speckle in real-time examining the relative difference between neighboring pixel values and determining whether the grayscale variations have a sharp difference, follow a trend, or are random in nature
- HD imaging – real-time simultaneous acquisition at dual frequencies compounded to help reduce speckle and noise while enhancing resolution and contrast
- Multiple-angle Compound Imaging – multiple co-planar images from different angles combined into a single image in real-time to help enhance border definition, contrast resolution, and reducing angular dependence of border or edge as compared to no-compound imaging
- Elevation compounding on 4D probes
- LOGIQ View: Provides the ability to construct and view a static 2D image with wider field-of-view (FOV) of a given transducer. This allows viewing and measurements of anatomy larger than what would fit in a single image
- Virtual convex allows a wider field-of-view in the depth to enhance image quality on linear probes
- Virtual apex provides a wider field-of-view with phased array probes, effective at certain imaging views where a wide near field is preferred
- L/R and up/down invert, in live, digital replay or image clipboard recall
- Digital replay for retrospective review or automatic looping of images, allowing for adjustment of parameters such as gain, reject, Anatomical M-mode, persistence and replay speed
- Data Dependent Processing (DDP) performs temporal processing which helps reduce random noise but leaves motion of significant tissue structures largely unaffected – can be adjusted even in digital replay
- 256 shades of gray
- Colorized 2D-mode, user-selectable in real-time, digital replay

Multi-Dimensional Mode

- Bi-plane scanning: Two independent simultaneous scan planes where one of them can be rotated and tilted freely
- Bi-plane prepare mode for ease of obtaining bi-plane views from 4D render data sets
- Tri-plane: Three independent simultaneous scan planes that can be rotated freely
- Both bi-plane and tri-plane scanning is possible in all color Doppler modes

4D Mode (optional)

- Flexi-volumes with customizable acquisition for volume size, volume rate or resolution
- Single-beat 4D scanning with real-time volume rendering display
- Multi-beat 4D scanning for high-resolution scanning
- Adjustable volume sizes for both single- and multi-beat scanning
- Adjustable volume shape control
- Pre-defined volume sizes for quick volume setup
- Adjustable number of cycles for multi-beat scanning
- FlexiZoom for easy 4D visualization of structures of interest

- 4D scanning supporting variable octave and fundamental frequencies
- Coherent volume processing with motion compensation for seamless and artifact-free 4D and 2D slices
- Variable frame rate settings available
- Volume optimize control for volume rendering transparency and quality setting
- Flip crop available for changing 4D view direction 180 degrees with mirrored crop volume
- Dynamic multi-slice enables positioning of the multi-slice, short-axis cut-planes at same anatomical position throughout the heart cycle
- Live multi-slice layouts available during live 4D acquisition
- FlexiSlice for interactive slicing, cropping and navigation designed to provide the user with a flexible, yet intuitive way of extracting 2D slices from 4D data sets
- View crop setting for toggle control of view plane vs. crop plane
- 2 Click crop for quick and easy extraction of standard and non-standard views for visualization of 4D structures seen during or after the examination
- Dual crop for fast and efficient visualization of complex structures from both sides at the same time
- Stereo vision in 4D
- Laser lines to help improve the visual linkage between the 4D-rendered view and the 2D slices
- Wide range of depth color rendering maps
- QuickRotate and Rotate for a flexible and easily accessible way of obtaining the desired single- or multi-plane, two-dimensional views
- FlexiViews offer instant access to predefined (factory or user created) 4D views during live mode

M-mode

- Trackball steers M-mode line available with all imaging probes – max steering angle is probe dependent
- Simultaneous real-time 2D and M-mode
- M-mode PRF 1 kHz – image data acquired is combined to give high-quality recording regardless of display scroll speed
- Digital replay for retrospective review of M-mode data
- Several top-bottom formats, side-by-side format and time-motion-only format – can be adjusted in live or digital replay
- Selectable horizontal scroll speed: 1, 2, 3, 4, 6, 8, 12, 16 seconds across display
- Horizontal scroll can be adjusted in live or digital replay

Anatomical M-mode

- M-mode cursor can be adjusted at any plane
- Curved Anatomical M-mode – free (curved) drawing of M-mode generated from the cursor independent from the axial plane
- Can be activated from live, digital replay or image clipboard recall
- Anatomical color and Tissue Velocity M-mode
- M&A capability

Color Doppler Imaging

General

- Steerable color Doppler available with all imaging probes – max steering angle is probe dependent
- Trackball-controlled ROI
- Removal of color map from the tissue during digital replay
- Digital replay for retrospective review of color or color M-mode data allowing for adjustment of parameters such as encoding principle, color priority and color gain even on stored data
- PRF settings – user-selectable
- Advanced regression wall filter gives efficient suppression of wall clutter
- For each encoding principle, multiple color maps can be selected in live and digital replay, variance maps available
- More than 65,000 simultaneous colors processed, providing a smooth display two-dimensional color maps containing a multitude of color hues
- Simultaneous display of grayscale 2D and 2D with color flow
- Color invert – user-selectable in live and digital replay
- Variable color baseline user-selectable in live and digital replay
- Multi-variate color priority function gives delineation of disturbed flows even across bright areas of the 2D-mode image
- Color Doppler frequency can be changed independently from 2D

Color Flow Imaging

- The cSound platform with its parallel beamformer architecture allows a combination of ultra-high frame rate and increased lateral resolution compared to previous generation GE scanners
- Very high digital signal processing power, maintaining high frame rates with large ROI's even for very low PRF settings
- Frame Rate in excess of 700 fps, depending on probe and settings
- Variable ROI size in width and depth
- User-selectable radial and lateral averaging to help reduce statistical uncertainty in color velocity and variance estimates
- Data Dependent Processing (DDP) performs temporal processing and display smoothing to help reduce loss of transient events of hemodynamic significance
- Digital replay for retrospective review or automatic looping of color images, allowing for adjustment of parameters such as DDP, encoding principle, baseline shift, color maps, color priority and color gain even on frozen/recalled data
- Application-dependent, multi-variate motion discriminator helps reduce flash artifacts
- Dedicated coronary flow application

- Multiple-angle compound imaging in 2D mode is maintained while in color Doppler mode

Multi-Dimensional Color Mode

- Bi-plane and tri-plane scanning with all color Doppler and tissue velocity modes

4D Color Doppler Imaging

- Single-beat 4D color flow scanning
- Volume size control to change the size of the color ROI
- Multi-beat 4D color flow scanning using ECG stitching for increased volume rate
- Adjustable number of cycles for multi beat scanning
- Variable volume rate settings
- Flip crop available for changing 4D view direction 180 degrees with mirrored crop volume
- View-crop setting for toggle control of view plane vs. crop plane
- Stereo vision in 4D color
- Tissue transparency control
- Flow transparency control to visualize tissue behind the flow
- HD color to enhance the perception of 4D color when visualized on a 2D monitor by the addition of shadowing and specular reflection techniques; ability to see turbulent velocity components inside the flow volume by the use of transparency control
- Seamless transition from 2D color to 4D color keeping ROI size and position

Color Angio

- Angle-independent, power Doppler mode for visualization of slow flow vessels with enhanced sensitivity compared to standard color flow of previous GE Healthcare products

Color M-mode

- Variable ROI length and position – user-selectable
- User-selectable radial averaging to help reduce statistical uncertainty in color velocity and variance estimates
- Selectable horizontal scroll speed: 1, 2, 3, 4, 6, 8, 12, 16 seconds across display – can be adjusted during live, digital replay or image clipboard recall
- Real-time 2D image while in color M-mode
- Same controls and functions available as in standard 2D color Doppler

Anatomical Color M-mode

- GE Healthcare-patented, any plane color M-mode display derived from color Doppler cine loop
- Applicable to Tissue Velocity Imaging
- M&A capability

B-flow

- B-flow is a digital imaging technique that provides real-time visualization of vascular hemodynamics by directly visualizing blood reflectors and presenting this information in a grayscale display
- Use of GE Healthcare-patented techniques to boost blood echoes, and to help preferentially suppress non-moving tissue signals
- B-flow is available for most vascular and shared service applications

Blood Flow Imaging

- Combines color Doppler with grayscale speckle imaging
- Helps improve delineation of blood flow without bleeding into tissue or vessel wall

Blood Flow Angio Imaging

- Combines angio with grayscale speckle imaging

Strain Elastography

- Visualization of relative tissue stiffness

Spectral Doppler

General

- Operates in PW, HPRF and CW modes
- Trackball steerable Doppler available with all imaging probes – max steering angle is probe dependent
- Selectable Doppler frequency for enhanced optimization
- High-quality, real-time duplex or triplex operation in all Doppler modes, CW and PW, for all velocity settings
- Frame rate control for optimized use of acquisition power between spectrum, 2D and color Doppler modes in duplex or triplex modes
- Very fast and flexible spectrum analysis with an equivalent DFT rate of 0.2 ms
- Dynamic gain compensation for display of flows with varying signal strengths over the cardiac cycle to help improve ease of use
- Dynamic reject gives consistent suppression of background – user-selectable in real-time, digital replay or image clipboard recall
- Digital replay for retrospective review of spectral Doppler data
- Several top-bottom formats, side-by-side format and time- motion-only format – can be adjusted in live or digital replay
- Selectable horizontal scroll speed: 1, 2, 3, 4, 6, 8, 12, 16 seconds across display – can be adjusted in live or digital replay
- Adjustable spectral Doppler display parameters: Gain, reject, compress, color maps – can be adjusted in live or digital replay
- User-adjustable baseline shift – in live, digital replay and image clipboard recall
- Adjustable velocity scale
- Wall filters with range 10-2000 Hz (velocity scale dependent)
- Angle correction with automatic adjustment of velocity scale in live, digital replay and image clipboard recall
- Auto Doppler angle
- Stereo speakers mounted in the front panel
- Display annotations of frequency, mode, scales, Nyquist limit, wall filter setting, angle correction, acoustic power indices
- Compound in duplex

PW/HPRF Doppler

- Automatic HPRF Doppler maintains its sensitivity even for shallow depths and with high PRF's
- Digital velocity tracking Doppler employs processing in range and time for high-quality spectral displays
- Adjustable sample volume size of 1-16 mm (probe dependent)
- Maximum sample volume depth 30 cm

CW Doppler

- Highly sensitive steerable CW available with all phased array probes

Contrast Imaging

LV Contrast (accessed through QuickApps)

- Enables contrast applications intended for imaging of the left ventricle
- LV contrast (M5Sc-D, 3Sc-RS, 6VT-D and 6Tc-RS probes) enhances delineation of the LV border in combination with ultrasound contrast agents. The implementation of GE Healthcare's Coded Phase Inversion (CPI) provides high- resolution detection of contrast in the LV cavity and excellent suppression of myocardial tissue signals
- LVO stress (M5Sc-D probe) provides enhanced delineation of the LV border when contrast is used as part of an exercise stress exam, preserving an adequately long continuous capture buffer length

Contrast Low MI (optional)[2]

Contrast Low MI imaging is enabled by the Advanced Contrast option. Contrast Low MI is a preset that enables real-time continuous imaging of microbubbles using a low enough MI to generate return signals from the bubbles without destroying them. The user can choose between two types of transmit techniques controlled by the Frequency rotary: Power Modulation and Pulse Inversion, each with different characteristics that may affect imaging performance depending on the type of microbubbles being used.

- A high MI Flash feature is available to rapidly destruct bubbles. Other controls are also available for image acquisition optimization.
- Imaging can be performed in live or with ECG triggering.
- The contrast intensity can be quantified using the QAnalysis package.
- The option may not be available in all countries.

Vascular/Abdominal Contrast (optional)[2]

Vascular contrast – enables contrast applications intended for vascular (9L-D) and abdominal (C1-5-D and C1-6-D) contrast imaging. The option may not be available in all countries.

- Vascular contrast (9L-D) – coded phase inversion enables excellent detection and resolution of vascular contrast imaging

Tissue Velocity Imaging

Tissue Velocity Imaging Mode

- Myocardial Doppler imaging with color overlay on tissue image
- Tissue Doppler data can be acquired in background during regular 2D imaging
- Frame rate in excess of 1220 fps, depending on probe and settings
- The velocity of myocardial segments after entire heart cycle can be displayed in one single image
- Tissue color overlay can be removed to show just the 2D image, still retaining the tissue velocity information
- Quantitative profiles for TVI, Tissue Tracking, strain and strain rate can be derived
- Time markers for valve events derived from any TM mode help simplify understanding of signals in velocity traces or Curved Anatomical M-mode

Tissue Tracking Mode

- Real-time display of the time integral of TVI for quantitative display of myocardial systolic displacement
- Myocardial displacement is calculated and displayed as a color-coded overlay on the grayscale and M-mode image – different colors represent different displacement ranges

Tissue Synchronization Imaging Mode

- Parametric imaging which gives information about synchronicity of myocardial motion
- Myocardial segments colored according to time to peak velocity, green for early and red for late peak
- Waveform trace available to obtain quantitative time to peak measurement from TSI Image
- Available in live scanning, as well as an offline calculation derived from Tissue Doppler data
- Efficient segment specific TSI time measurements
- Immediate bulls-eye report
- Automatic calculated TSI synchrony indexes
- TSI surface mapping
- LV synchronization report template
- CRT programming protocol
- Additional features in combination with multi-dimensional imaging option
- Simultaneous acquisition of Tri-plane TSI images covering all standard segments in apical views

Strain/Strain Rate Mode

- Tissue deformation (strain) and rate of deformation (strain rate) are calculated and displayed as real-time, color-coded overlay on the 2D image
- Cine Compound calculates and displays cineloops generated from a temporal averaging of multiple consecutive heart cycles

[2] *GE Healthcare's Vivid scanner is designed for compatibility with commercially available contrast agents. Because the availability of these agents is subject to government regulation and approval, product features intended for use with these agents may not be commercially marketed nor made available before the contrast agent is approved for use. The Contrast Low MI and Vascular/Abdominal Contrast options are not available in USA.*

- Anatomical M-mode and Curved Anatomical M-mode displays (SI and SRI)

Physiological Traces

- Integrated three-lead ECG module
- Automatic QRS complex detection
- External ECG lead input
- Internally generated respiratory trace using ECG leads
- ECG lead selection
- Adjustable ECG QRS markers

Automatic Optimization

- Dynamic optimization of B-mode image to help improve contrast resolution, gain, TGC and grayscale (soft or sharp, user-selectable)
- Automatic Spectrum Optimization (ASO) provides a single press, automatic, real-time optimization of PW or CW spectrum scale, and baseline display

Protocol Features

Scan Assist Pro

- Customizable automations that assist the user through each step of the scan
- Helps enhance consistency and reduce keystrokes
- Ultrasound image, anatomical picture, step by step training through a pre-defined protocol
- Supports selection of all modes, all measurements and dual annotations
- Imaging attributes: Octave, Steer, Dual/Quad screen, Compound, LOGIQ View, Zoom, Depth, Scale and Baseline
- On-line or off-line protocol editor
- Image acquisition according to predefined protocol templates
- Various factory protocol templates
- User-configurable protocol templates

Pre-Post Compare

- Labelling of measurements and images acquired in different stages of an exam or procedure, allowing to compare measurements pre and post procedure.

Stress Echo (optional)

Supported Protocol Examinations

- 2D pharmacological stress echo
- 2D bicycle stress echo
- 2D continuous capture stress echo (treadmill stress echo)
- Cardiac resynchronization therapy programming protocols

  (available with the Advanced QScan option)

Protocol Examinations Features
(enabled with stress option)

- Wall motion scoring: Analysis by wall motion in individual myocardial segments
- Show reference: Show a reference image from baseline or previous level during acquisition
- Smart stress: Automatically set up various scanning parameters (for instance geometry, frequency, gain, etc.) according to same projection on previous level
- Scan mode settings: Scan mode may be specified for individual views in the protocol
- Preview of store: Show running loops as preview before storing to the examination

Continuous Capture

- Continuously acquire large amounts of 2D image data, and selection of projection views for analysis
- The entire continuous capture recording may be kept in memory while it is possible to store new images outside the protocol template, or the entire recording can be stored to file
- Selection of projection views on scanner or EchoPAC when the entire recording is stored to file

Wall Motion Scoring

- As part of the measurement and analysis package one can access a wall motion assessment module, providing analysis/scoring of individual myocardial segments
- For use with all stress modalities

Cardiac Resynchronization Therapy (CRT) Programming Protocols

- CRT protocols require Stress and Advanced QScan
- Tailored acquisition protocol for data needed for programming of AV and VV delays in biventricular pacemakers
- Image acquisition of a set of projection views with various scan mode settings
- Template editor
- User-configurable protocol templates
- Configure protocol name, number of levels and views, name of level and views and several other protocol settings (smart stress, show reference, scan mode, preview of store, timer handling, etc.)

CARTO® 3 Interface (optional)

- The system can interface with the CARTO 3 EP navigation system and the SOUNDSTAR® ultrasound catheters manufactured by Biosense Webster, Inc
- The interface will allow the Vivid S70N system to send images to the CARTO3 EP system over a video cable
- The Vivid S70N is able to send ultrasound scaling parameters to the CARTO 3 EP system via a peer-to-peer LAN connection

Visualization and Navigation Tools

(with 4D probes 6VT-D and 4D ICE, together with the 4D option)

4D Views

- Auto alignment to define standard orientation of acquired 4D data
- Standard views, such as 4CH, 2CH, LAX, mitral valve and aortic valve, are defined from the standard orientation
- Automatic display of volume renderings and 2D cut planes from standard views

4D Data Cropping

- Flexible tool for standard or dynamic cropping (with 4D option) 4D data using up to six different crop planes

- Each crop plane can be moved without any restrictions
- The crop plane positions are visible in both the volume rendering and in the 2D cut plane displays

Depth Render

- Volume visualization where color hue changes according to distance into the image
- Wide selection of different render maps

Stereo Render

- Volume visualization by stereoscopic display, requires red/cyan stereoscopic glasses for StereoVision

Multi-slice

- Simultaneous display of 5, 6, 7, 9 or 12 slices extracted from the 4D volume data (tissue and/or color)
- Combination of short axis and long axis standard views.
- Available in live (with 4D option) and replay

FlexiSlice

- Simultaneous display of three independent random slices through the 4D volume (tissue and color)
- Four different layouts available (default, bi-plane, LAX, SAX)
- Ability to add distances for quantification purposes
- Ability to rotate the view direction of the volume rendering independently of the slice orientations

FlexiViews

- Provides instant access to predefined (factory or user created) 4D views during live mode
- May provide more consistent data while reducing scanning time

4D Markers (optional)

- 4D markers option enables placement of markers/annotations into a 4D ultrasound volume data set
- The markers are named and keep their position relative to the 4D data set
- Ability to individually edit, move, change size, choose color and delete the markers

View-X (optional)

- Interface between a cath system and the Vivid scanner, such that cath x-ray image can be shown on the Vivid scanner screen, together with the ultrasound image (picture-in-picture)

Measurement and Analysis (M&A)

- Personalized measurement protocols allow individual set and order of M&A items
- Measurements can be labeled seamlessly by using protocols or post assignments
- Measurements assignable to protocol capability
- Parameter annotation follows ASE standard
- Seamless data storage and report creation
- User-assignable parameters
- Comprehensive set of adult and pediatric cardiac measurements and calculations to help assess dimensions, flow properties and other functional parameters of the heart
- Comprehensive set of shared service measurements and calculations covering vascular, abdominal, obstetrics and other application areas
- Configuration package to set up a customized set and sequence of measurements to use, defining user-defined measurements and changing settings for the factory-defined measurements
- Stress echo support allowing wall motion scoring and automatic stress level labeling of measurements
- Stress echo is directly accessible from the system control panel with a dedicated button
- Support for measuring on DICOM images
- AI-based Cardiac Auto 2D Measurement (optional) enables semi-automated quantification of the most common distance measurements performed on parasternal LAX 2D images with minimum user guidance
- Cardiac Auto Doppler automatically provides Doppler measurement results for the most common parameters, with minimal user guidance
- AI-based Spectrum Recognition (optional) enables automated recognition of the most common Doppler spectra and automatically starts the Auto Doppler measurement (where available), or opens the according manual measurement
- Automatic Doppler trace functionality for use in non-cardiac applications in both live and replay
- Worksheet allows user to review, edit and delete performed measurements
- Reporting support allowing a configurable set of measurements to be shown in the exam report
- DICOM SR export of measurement data

Automated Function Imaging (AFI 3.0) (optional)

- Third generation parametric imaging tool which gives quantitative data for global and segmental strain
- Allows comprehensive assessment at a glance by combining three apical longitudinal views into one comprehensive bulls-eye view
- Integrated into M&A package with specialized report templates
- 2D strain-based data moves into clinical practice
- Automatic labeling of views during acquisition enabled by an AI-based algorithm called View Recognition is used to simplify the AFI workflow eliminating the need to pick views
- Simplified and flexible workflow with fully automated ROI tracing (if configured), adaptive ROI width and combined display of traces from all segments

- User-selectable endo or full wall global strain values displayed
- Random sequence of analysis of the three views supported
- Ability to exit tool after one or two views completed ("Easy AFI," only global strain supported)
- Applicable to transthoracic and to TEE 2D data
- Integrated AutoEF calculation
- Can process GE Healthcare raw data and DICOM data from Vivid systems
- Can process DICOM data from other vendors' ultrasound system

Easy AFI LV (optional)

- Automated one-click AFI LV analysis. Our AI-based Auto ROI detection algorithm allows users to complete the AFI workflow with no manual interaction apart from initiating the measurement tool and approving the results.

Automated Function Imaging Right Ventricle (AFI RV) (optional)

- Parametric imaging tool which gives quantitative data for Right Ventricular Longitudinal Global Strain, Free Wall Strain and Segmental Strain derived from the apical 4-chamber RV focused view
- Tricuspid Annular Plane Systolic Excursion (TAPSE) provided
- Simplified and flexible workflow with 3-point click method for ROI selection supports editing of both endo and epicardia borders, and adaptive ROI width
- Combined display of traces from all segments
- User-selectable endo or full wall global strain values displayed

Automated Function Imaging Left Atrium (AFI LA) (optional)

- Parametric tool giving quantitative data from GE Healthcare raw data images for LA Longitudinal Global Wall Strain, LA Volumes and Emptying Fraction
- Single-plane (4-channel or 2-channel) or bi-plane (4-channel or 2-channel) measurement
- Simplified and flexible workflow with 3-point click method for ROI selection and adaptive ROI width
- Full wall tracking

Automated Ejection-Fraction Calculation (AutoEF 3.0) (optional)

- Third generation automated EF measurement tool based on 2D-speckle tracking algorithm and on Simpson
- Automatic labeling of views during acquisition enabled by an AI-based algorithm called View Recognition is used to simplify the AutoEF workflow eliminating the need to pick views
- Calculated Ejection Fraction with or without ECG signals with automated[3] workflow from a frozen image in 2-chamber or 4-chamber view.
- Calculated bi-plane Ejection Fraction with or without ECG signal from recalled images.
- Integrated into M&A package with worksheet summary
- Can process GE Healthcare raw data and DICOM data from Vivid systems
- Can process DICOM data from other vendors' ultrasound system

Easy AutoEF (optional)

- Automated one-click Ejection Fraction (EF) measurement. Our AI-based Auto ROI detection algorithm allows users to complete the Ejection Fraction (EF) measurement on loops acquired with or without ECG signal, and with no manual interaction apart from initiating the measurement tool and approving the results.

4D Chamber Quantification Tools

4D Auto LVQ (included with 4D option – used with 4D probes 6VT-D and 4D ICE)

- Fully integrated semi-automated measurement of LV volume and EF from volumetric data
- Automated identification of standard views
- Validation of detected boundaries
- LV volume waveform for entire cardiac cycle
- ED and ES automatically selected from volume waveform (max/min)
- Editing by point and click
- User approval of final results
- Fully integrated into M&A system with results in worksheet

4D Auto RVQ (optional, requires 4D option to enable – used with 4D probes 6VT-D and 4D ICE)

- Automated measurement of RV volume and EF from volumetric data, with minimal user guidance
- Automated identification of standard views
- Validation of detected boundaries
- RV volume waveform for entire cardiac cycle
- ED and ES automatically selected from volume waveform
- Editing by point and click
- User approval of final results
- Fully integrated into M&A system with results in worksheet

4D Valve Quantification Tools

4D Auto AVQ (optional, requires 4D option to enable – used with 4D probes 6VT-D and 4D ICE)

- Semi-automated alignment, segmentation and measurement of aortic annulus from volumetric data
- Editing by point and click
- User approval of final results
- Fully integrated in M&A system with results in worksheet

4D Auto MVQ (optional, requires 4D option to enable – used with 4D probes 6VT-D and 4D ICE)

- GE Healthcare's fully integrated semi-automated mitral valve quantification package offers the ability to visualize

[3] *Automated refers to workflow potentially involving no user interaction before approval; users can adjust contours and frame selection during the process.*

the mitral valve and include quantitative results into the patient exam

Quantitative Analysis Package (Q-Analysis)

- Traces for tissue velocity or derived parameters (strain rate, strain, displacement) inside defined regions of interest as function of time
- Contrast analysis with traces for gray-scale intensity or angio power inside defined regions of interest as function of time
- Curved Anatomical M-mode display allowing an M-mode along an arbitrary curve in a 2D image
- Sample-area points may be dynamically anchored to move with tissue when running cineloop
- Cine Compound displays cineloops generated from a temporal averaging of multiple consecutive heart cycles

Generic Measurements

- BSA (Body Surface Area)
- MaxPG (Maximum Pressure Gradient)
- MeanPG (Mean Pressure Gradient)
- % Stenosis (Stenosis Ratio)
- PI (Pulsatility Index)
- RI (Resistivity Index)
- HR (Heart Rate) – beats/minute
- A/B Ratio (Velocities Ratio)
- TAMAX (Time Averaged Maximum Velocity) – Trace method is Peak or Manual
- TAMIN (Time Averaged Minimum Velocity) – Trace method is Floor
- TAMEAN (Time Averaged Mean Velocity) – Trace method is Mean
- Volume
- Area
- Spline Tool

Cardiac Measurements/Calculations

- %FS (LV Fractional Shortening)
- %IVS Thck (IVS Fractional Shortening)
- %LVPW Thck (LV Posterior Wall Fractional Shortening)
- Ao Arch Diam (Aortic Arch Diameter)
- Ao Asc (Ascending Aortic Diameter)
- Ao Desc Diam (Descending Aortic Diameter)
- Ao Isthmus (Aortic Isthmus)
- Ao Root Diam (Aortic Root Diameter)
- AR ERO (PISA: Regurgitant Orifice Area)
- AR Flow (PISA: Regurgitant Flow)
- AR PHT (AV Insuf. Pressure Half Time)
- AR Rad (PISA: Radius of Aliased Point)
- AR RF (Regurgitant Fraction over the Aortic Valve)
- AR RV (PISA: Regurgitant Volume Flow)
- AR Vel (PISA: Aliased Velocity)
- AR Vmax (Aortic Insuf. Peak Velocity)
- AR VTI (Aortic Insuf. Velocity Time Integral)
- ARed max PG (Aortic Insuf. End-Diastole Pressure Gradient)
- ARed Vmax (Aortic Insuf. End-Diastolic Velocity)
- AV Acc Slope (Aortic Valve Flow Acceleration)
- AV Acc Time (Aortic Valve Acceleration Time)
- AV AccT/ET (AV Acceleration to Ejection Time Ratio)
- AV EOAI (VTI) (Aortic Valve Effective Orifice Area Index by Continuity Equation VTI)
- AV EOAI Vmax (Aortic Valve Effective Orifice Area Index by Continuity Equation Peak V)
- AV CO (Cardiac Output by Aortic Flow)
- AV Cusp (Aortic Valve Cusp Separation, 2D)
- AV Dec Time (Aortic Valve Deceleration Time)
- AV Diam (Aortic Diameter, 2D)
- AV max PG (Aortic Valve Peak Pressure Gradient)
- AV mean PG (Aortic Valve Mean Pressure Gradient)
- AV SV (Stroke Volume by Aortic Flow)
- AV Vmax (Aortic Valve Peak Velocity)
- AV Vmean (AV Mean Velocity)
- AV VTI (Aortic Valve Velocity Time Integral)
- AVA (Vmax) (AV Area by Continuity Equation by Peak V)
- AVA (VTI) (AV Area by Continuity Equation VTI)
- AVA Planimetry (Aortic Valve Area)
- AVET (Aortic Valve Ejection Time)
- CO (Teich) (Cardiac Output, M-mode, Teicholtz)
- D-E Excursion (MV Anterior Leaflet Excursion)
- E' Avg (Averaged early diastolic mitral valve annular velocity)
- E' Lat (Early diastolic mitral valve lateral annular velocity)
- E' Sept (Early diastolic mitral valve septal annular velocity)
- E/E' Avg (Mitral inflow E velocity to E' Avg ratio)
- E/E' Lat (Mitral inflow E velocity to E' Lat ratio)
- E/E' Sept (Mitral inflow E velocity to E' Sept ratio)EDV (Cube) (Left Ventricle Volume, Diastolic, 2D, Cubic)
- EF (A-L A2C) (Ejection Fraction 2CH, Single Plane, Area-Length)
- E-F Slope (Mitral Valve E-F Slope)
- EPSS (E-Point-to-Septum Separation, M-mode)
- ERO (Effective Regurgitant Orifice)
- ESV (Cube) (Left Ventricle Volume, Systolic, 2D, Cubic)
- HR (Heart Rate, 2D, Teicholtz)
- IVC (Inferior Vena Cava)
- IVCT (Isovolumic Contraction Time)
- IVRT (Isovolumic Relaxation Time)
- IVSd (Interventricular Septum Thickness, Diastolic, 2D)
- VSs (Interventricular Septum Thickness, Systolic, 2D)
- LA Diam (Left Atrium Diameter, 2D)
- LA Major (Left Atrium Major)
- LA Minor (Left Atrium Minor)
- LA/Ao (LA Diameter to AoRoot Diameter Ratio, 2D)
- LAAd (A2C) (Left Atrium Area, Apical 2C)

- LAEDV (A-L) (LA End Diastolic Volume, Area- Length)
- LAEDV Index (A-L) (LA End Diastolic Volume Index, Area-Length)
- LAESV (A-L) (LA End Systolic Volume, Area-Length)
- LAESV Index (A-L) (LA End Systolic Volume Index, Area-Length)
- LAEDV MOD (LA End Diastolic Volume MOD)
- LAESV MOD (LA End Systolic Volume MOD)
- LIMP (Left Index of Myocardial Performance)
- LVA (s) (Left Ventricular Area, Systolic, 2CH)
- LVAd (A2C) (Left Ventricular Area, Diastolic, 2CH)
- LVAd (sax) (LV Area, SAX, Diastolic)
- LVAend (d) (LV Endocardial Area, SAX)
- LVAepi (d) (LV Epicardial Area, SAX)
- LVAs (A4C) (Left Ventricular Area, Systolic, 4CH)
- LVAs (sax) (LV Area, SAX, Systolic)
- LVd Mass (LV Mass, Diastolic, 2D)
- LVd Mass (LV Mass, Diastolic, M-mode)
- LVd Mass Index (LV Mass Index, Diastolic, 2D)
- LVEDV (A-L A2C) (LV Volume, Diastolic, 2CH, Area-Length)
- LVESV (A-L A2C) (LV Volume, Systolic, 2CH, Area-Length)
- LVET (Left Ventricle Ejection Time)
- LVIDd (LV Internal Dimension, Diastolic, 2D)
- LVIDs (LV Internal Dimension, Systolic, 2D)
- LVLd (Apical) (Left Ventricular Length, Diastolic, 2D)
- LVLs (Apical) (Left Ventricular Length, Systolic, 2D)
- LVOT Area (Left Ventricle Outflow Tract Area)
- LVOT CO (Cardiac Output by Aortic Flow)
- LVOT Diam (Left Ventricular Outflow Tract Diameter)
- LVOT Max PG (LVOT Peak Pressure Gradient)
- LVOT Mean PG (LVOT Mean Pressure Gradient)
- LVOT SI (Stroke Volume Index by Aortic Flow)
- LVOT SV (Stroke Volume by Aortic Flow)
- LVOT Vmax (LVOT Peak Velocity)
- LVOT Vmean (LVOT Mean Velocity)
- LVOT VTI (LVOT Velocity Time Integral)
- LVPWd (Left Ventricular Posterior Wall Thickness, Diastolic, 2D)
- LVPWs (Left Ventricular Posterior Wall Thickness, Systolic, 2D)
- LVs Mass (LV Mass, Systolic, 2D)
- LVs Mass Index (LV Mass Index, Systolic, 2D)
- LAAd (A2C) (Left Atrium Area, Apical 2C)
- MCO (Mitral Valve Closure to Opening)
- MP Area (Mitral Valve Prosthesis)
- MR Acc Time (MV Regurg. Flow Acceleration)
- MR ERO (PISA: Regurgitant Orifice Area)
- MR Flow (PISA: Regurgitant Flow)
- MR Max PG (Mitral Regurg. Peak Pressure Gradient)
- MR Rad (PISA: Radius of Aliased Point)
- MR RF (Regurgitant Fraction Over the Mitral Valve)
- MR RV (PISA: Regurgitant Volume Flow)
- MR Vel (PISA: Aliased Velocity)
- MR Vmax (Mitral Regurg. Peak Velocity)
- MR Vmean (Mitral Regurg. Mean Velocity)
- MR VTI (Mitral Regurg. Velocity Time Integral)
- MV A Dur (Mitral Valve A-Wave Duration)
- MV A Velocity (MV Velocity Peak A)
- MV Acc Slope (Mitral Valve Flow Acceleration)
- MV Acc Time (Mitral Valve Acceleration Time)
- MV Acc/Dec Time (MV: Acc.Time/Decel.Time Ratio)
- MV Ann Diam (Mitral Valve Annulus Diameter, 2D)
- MV CO (Cardiac Output by Mitral Flow)
- MV Dec Slope (Mitral Valve Flow Deceleration)
- MV Dec Time (Mitral Valve Deceleration Time)
- MV E Velocity (MV Velocity Peak E)
- MV E/A Ratio (Mitral Valve E-Peak to A-Peak Ratio)
- MV Max PG (Mitral Valve Peak Pressure Gradient)
- MV Mean PG (Mitral Valve Mean Pressure Gradient)
- MV PHT (Mitral Valve Pressure Half Time)
- MV Reg Frac (Mitral Valve Regurgitant Fraction)
- MV SI (Stroke Volume Index by Mitral Flow)
- MV SV (Stroke Volume by Mitral Flow)
- MV Time to Peak (Mitral Valve Time to Peak)
- MV Vmax (Mitral Valve Peak Velocity)
- MV Vmean (MV Mean Velocity)
- MV VTI (Mitral Valve Velocity Time Integral)
- MVA (Mitral Valve Area)
- MVA By PHT (Mitral Valve Area according to PHT)
- MVA by Plan (Mitral Valve Area, 2D)
- MVET (Mitral Valve Ejection Time)
- P Vein A (Pulmonary Vein Velocity Peak A) – reverse
- P Vein A Dur (Pulmonary Vein A-Wave Duration)
- P Vein D (Pulmonary Vein End-Diastolic Peak Velocity)
- P Vein S (Pulmonary Vein Systolic Peak Velocity)
- PAEDP (Pulmonary Artery Diastolic Pressure)
- PE(d) (Pericard Effusion, M-mode)
- PEs (Pericard Effusion, 2D)

- PR Max PG (Pulmonic Insuf. Peak Pressure Gradient)
- PR Mean PG (Pulmonic Insuf. Mean Pressure Gradient)
- PR PHT (Pulmonic Insuf. Pressure Half Time)
- PR Vmax (Pulmonic Insuf. Peak Velocity)
- PR VTI (Pulmonic Insuf. Velocity Time Integral)
- PRend max PG (Pulmonic Insuf. End-Diastole Pressure Gradient)
- PRend Vmax (Pulmonic Insuf. End-Diastolic Velocity)
- Pulmonic Diam (Pulmonary Artery Diameter, 2D)
- PV Acc Slope (Pulmonic Valve Flow Acceleration)
- PV Acc Time (Pulmonic Valve Acceleration Time)
- PV Acc Time/ET Ratio (PV Acceleration to Ejection Time Ratio)
- PV Ann Diam (Pulmonic Valve Annulus Diameter, 2D)
- PV Ann Area (Pulmonic Valve Area)
- PV CO (Cardiac Output by Pulmonic Flow)
- PV max PG (Pulmonic Valve Peak Pressure Gradient)
- PV mean PG (Pulmonic Valve Mean Pressure Gradient)
- PV SV (Stroke Volume by Pulmonic Flow)
- PV Vmax (Pulmonary Artery Peak Velocity)
- PV Vmean (PV Mean Velocity)
- PV VTI (Pulmonic Valve Velocity Time Integral)
- PVA (VTI) (Pulmonary Artery Velocity Time Integral)
- PVein S/D Ratio (Pulmonary Vein SD Ratio)
- PVET (Pulmonic Valve Ejection Time)
- PVPEP (Pulmonic Valve Pre-Ejection Period)
- PVPEP/ET Ratio (PV Pre-Ejection to Ejection Time Ratio)
- Qp/Qs (Pulmonic-to-Systemic Flow Ratio)
- RA Major (Right Atrium Major, 2D)
- RA Minor (Right Atrium Minor, 2D)
- RAA (d) (Right Atrium Area, 2D, Diastole)
- RAA (s) (Right Atrium Area, 2D, Systole)
- RAEDV A2C (Right Atrium End Diastolic Volume, Apical 2 Chamber)
- RAESV A-L (RA End Systole Volume [A-L])
- RALd (Right Atrium Length, Diastole)
- RALs (RA Length, Systole)
- RIMP (Right Index of Myocardial Performance)
- RJA (A4C) (Regurgitant Jet Area)
- RJA/LAA (Regurgitant Jet Area Ratio RJA/LAA)
- RV Major (Right Ventricle Major)
- RV Minor (Right Ventricle Minor)
- RV S' (Tricuspid annulus systolic excursion velocity)
- RVAWd (Right Ventricle Wall Thickness, Diastolic, 2D)
- RVAWs (Right Ventricle Wall Thickness, Systolic, 2D)
- RVET (Right Ventricle Ejection Time)
- RVIDd (Right Ventricle Diameter, Diastolic, 2D)
- RVIDs (Right Ventricle Diameter, Systolic, 2D)
- RVOT Area (Right Ventricle Outflow Tract Area)
- RVOT Diam (RV Output Tract Diameter, 2D)
- RVOT Diam (RV Output Tract Diameter, M-Mode)
- RVOT Max PG (RVOT Peak Pressure Gradient)
- RVOT Mean PG (RVOT Mean Pressure Gradient)
- RVOT SI (LV Stroke Volume Index by Pulmonic Flow)
- RVOT SV (Stroke Volume by Pulmonic Flow)
- RVOT Vmax (RVOT Peak Velocity)
- RVOT Vmean (RVOT Mean Velocity)
- RVOT VTI (RVOT Velocity Time Integral)
- RVSP (Right Ventricle Systolic Pressure)
- RVWd (Right Ventricle Wall Thickness, Diastolic, M-mode)
- RVWs (Right Ventricle Wall Thickness, Systolic, M-mode)
- RAA (d) (Right Atrium Area, 2D, Diastole)
- RAA (s) (Right Atrium Area, 2D, Systole)
- SI (A-L A2C) (LV Stroke Index, Single Plane, 2CH, Area-Length)
- SI (A-L A4C) (LV Stroke Index, Single Plane, 4CH, Area-Length)
- SI (Biplane) (LV Stroke Index, Bi-plane, MOD)
- SI (bullet) (LV Stroke Index, Bi-plane, Bullet)
- SI (MOD A2C) (LV Stroke Index, Single Plane, 2CH, MOD)
- SI (MOD A4C) (LV Stroke Index, Single Plane, 4CH, MOD)
- SI (Teich) (LV Stroke Index, Teicholtz, 2D)
- SI (Teich) (LV Stroke Index, Teicholtz, M-mode)
- SV (A-L A2C) (LV Stroke Volume, Single Plane, 2CH, Area-Length)
- SV (A-L A4C) (LV Stroke Volume, Single Plane, 4CH, Area-Length)
- SV (Bi-plane) (LV Stroke Volume, Bi-plane, MOD)
- SV (bullet) (LV Stroke Volume, Bi-plane, Bullet)
- SV (MOD A2C) (LV Stroke Volume, Single-plane, 2CH, MOD) – Simpson
- SV (MOD A4C) (LV Stroke Volume, Single-plane, 4CH, MOD) – Simpson
- SV (Cube) (LV Stroke Volume, 2D, Cubic)
- SV (Cube) (LV Stroke Volume, M-mode, Cubic)
- SV (Teich) (LV Stroke Volume, 2D, Teicholtz)
- SV (Teich) (LV Stroke Volume, M-mode, Teicholtz)
- Systemic Diam (Systemic Vein Diameter, 2D)
- Systemic Vmax (Systemic Vein Peak Velocity)

- Systemic VTI (Systemic Vein Velocity Time Integral)
- TAPSE (Tricuspid Annular Plane Systolic Excursion)
- TCO (Tricuspid Valve Closure to Opening)
- TR Max PG (Tricuspid Regurg. Peak Pressure Gradient)
- TR Mean PG (Tricuspid Regurg. Mean Pressure Gradient)
- TR Vmax (Tricuspid Regurg. Peak Velocity)
- TR Vmean (Tricuspid Regurg. Mean Velocity)
- TR VTI (Tricuspid Regurgitation Velocity Time Integral)
- TVA Dur (Tricuspid Valve A-Wave Duration)
- TVA Velocity (Tricuspid Valve A Velocity)
- TV Acc Time (Tricuspid Valve Time to Peak)
- TV Ann Area (Tricuspid Valve Area)
- TV Ann Diam (Tricuspid Valve Annulus Diameter, 2D)
- TV Area (Tricuspid Valve Area, 2D)
- TV CO (Cardiac Output by Tricuspid Flow)
- TV Dec Slope (Tricuspid Valve Flow Deceleration)
- TV E Velocity (Tricuspid Valve E Velocity)
- TV E/A Ratio (Tricuspid Valve E-Peak to A-Peak Ratio)
- TV Max PG (Tricuspid Valve Peak Pressure Gradient)
- TV Mean PG (Tricuspid Valve Mean Pressure Gradient)
- TV Mean PG (Tricuspid Valve Mean Pressure Gradient)
- TV PHT (Tricuspid Valve Pressure Half Time)
- TV SV (Stroke Volume by Tricuspid Flow)
- TV Vmean (TV Mean Velocity)
- TV VTI (Tricuspid Valve Velocity Time Integral)
- VSD Max PG (VSD Peak Pressure Gradient)
- VSD Vmax (VSD Peak Velocity)

Please refer to the Reference Manual for the full list of measurements and calculations for all applications.

Z-Scores

- Support for six sets of user-selectable Z score publications[4] covering the most common pediatric dimension measurements

Vascular Measurements/Calculations

- RT ECA (Right External Carotid Artery Velocity)
- RT CCA (Right Common Carotid Artery Velocity)
- RT BIFURC (Right Carotid Bifurcation Velocity)
- RT ICA (Right Internal Carotid Artery Velocity)
- RT ICA/CCA (Right Internal Carotid Artery Velocity/Common Carotid Artery Velocity Ratio)
- LT ECA, LT CCA, LT BIFURC, LT ICA, LT ICA/CCA (same as above, for Left Carotid Artery)
- RT BULB (Right Bulbus Artery), RT VERT (Right Vertebral Artery), RT SUBC (Right Subclavian Artery), RT INN (Right Inn Artery)
- LT BULB, LT VERT, LT SUBC, LT INN
- Stent, pre-stent, post-stent
- A/B Ratio (Velocities Ratio)
- % Stenosis (Stenosis Ratio)
- S/D Ratio (Systolic Velocity/Diastolic Velocities Ratio)
- PI (Pulsatility Index)
- RI (Resistivity Index)
- HR (Heart Rate) – beats/minute
- UEV (Upper Extremity Vein velocities): IJV, SUBC, Axill V, BaSV, RV, UV, Ves, Pseudo, AVF, CephV
- UEA (Upper Extremity Artery velocities): Inn, SUBC, Axill, BA, RA, UA, Pseudo, AVF, Ves
- LEV (Lower Extremity Vein velocities): CFV, Saph FemJunc V, PopV, PTV, ATV, FV, GSV Calf, GSV Thigh, GSV Access, LSV, Saph PopJunc
- LEA (Lower Extremity Artery velocities): EIA, SFA, Pop, PTA, Peron, DPA, ATA, CFA, DFALEA
- MCA (Middle Cerebral Artery), ACA (Anterior Cerebral Artery), PCA (Posterior Cerebral Artery), AcomA (Anterior Communicating Artery), PComA (Posterior Communicating Artery), Basilar (Basilar Artery), Ves

[4] *Michael D. Pettersen, MD; Wei Du, PhD; Mary Ellen Skeens, MS; and Richard A. Humes, MD; Detroit, Michigan; and Andover, Massachusetts. Regression Equations for Calculation of Z Scores of Cardiac Structures in a Large Cohort of Healthy Infants, Children, and Adolescents: An Echocardiographic Study. Journal of the American Society of Echocardiography Pettersen et al. 923 Volume 21 Number 8.*

C Kampmann, C M Wiethoff, A Wenzel, et. al. Normal *Values of M Mode Echocardiographic Measurements of More Than 2000 Healthy Infants and Children in Central Europe. Heart 2000; 83; 667-672.*

M Cantinotti, MD; M Scalese, MS; B Murzi, MD; et. al. Echocardiographic Nomograms for Chamber Diameters and Areas in Caucasian Children. Journal of American Society of Echocardiography December 2014; Volume 27, Issue 12; 1279-1292.e2.

M Cantinotti, MD; M Scalese, MS; B Murzi, MD; et. al. Echocardiographic Nomograms for Ventricular, Valvular and Arterial Dimensions in Caucasian Children with a Special Focus on Neonates, Infants and Toddlers. Journal of American Society of Echocardiography February 2014; Volume 27, Issue 2; 179-191.e2.

Lopez L et. al. Relationship of Echocardiographic Z Scores Adjusted for Body Surface Area to Age, Sex, Race, and Ethnicity. The Pediatric Heart Network Normal Echocardiogram Database. Circ Cardiovasc Imaging. 2017 ov; 10(11). pii: e006979. doi: 10.1161/CIRCIMAGING.117.006979.

BEI Xia, Pediatric Ultrasound Imaging. Beijing: People's Medical Publishing House, 2013 (Second Edition): 173-227 and 261-289.

Intima Media Thickness (IMT) Measurements

- Automatic measurements of carotid artery Intima-Media Thickness (IMT) on any acquired frame
- On-board IMT package facilitates non-interrupted workflow – fully integrated with M&A, worksheet, archiving and reporting functions
- Algorithm provides robust, quick, reliable measurements which can be stored to the on-board archive for review and reporting
- IMT measurement can be made from frozen images or images retrieved from archive
- IMT package supports measurements of different regions of the intima in the carotid vessel (e.g., Lt./Rt./CCA/ICA etc.)
- Frame for IMT measurement can be selected in relation to the ECG waveform

OB/GYN Application Module

- OB package for fetal growth analysis containing more than 100 biometry tables
- Dedicated OB/GYN reports
- Fetal graphical growth charts
- Growth percentiles
- Multi-gestational calculations (up to four)
- Programmable OB tables
- Expanded worksheets
- User-selectable fetal growth parameters based on European, American or Asian methods charts
- GYN package for ovary and uterus measurements and reporting

OB Measurements/Calculations

- Gestational age by:
  - GS (Gestational Sac)
  - CRL (Crown Rump Length)
  - FL (Femur Length)
  - BPD (Biparietal Diameter)
  - AC (Abdominal Circumference)
  - HC (Head Circumference)
  - APTD x TTD (Anterior/Posterior Trunk Diameter by Transverse Trunk Diameter)
  - LV (Length of Vertebra)
  - FTA (Fetal Trunk Cross-sectional Area)
  - HL (Humerus Length)
  - BD (Binocular Distance)
  - FT (Foot Length)
  - OFD (Occipital Frontal Diameter)
  - TAD (Transverse Abdominal Diameter)
  - TCD (Transverse Cerebellum Diameter)
  - THD (Thorax Transverse Diameter)
  - TIB (Tibia Length)
  - ULNA (Ulna Length)
- Estimated Fetal Weight (EFW) by:
  - AC, BPD
  - AC, BPD, FL
  - AC, BPD, FL, HC
  - AC, FL
  - AC, FL, HC
  - AC, HC
  - EFBW
- Calculations and Ratios
  - FL/BPD
  - FL/AC
  - FL/HC
  - HC/AC
  - CI (Cephalic Index)
  - AFI (Amniotic Fluid Index)
  - CTAR (Cardio-Thoracic Area Ratio)
- Measurements/calculations by: ASUM, ASUM 2001, Berkowitz, Bertagnoli, Brenner, Campbell, CFEF, Chitty, Eik-Nes, Ericksen, Goldstein, Hadlock, Hansmann, Hellman, Hill, Hohler, Jeanty, JSUM, Kurtz, Mayden, Mercer, Merz, Moore, Nelson, Osaka University, Paris, Rempen, Robinson, Shepard, Shepard/Warsoff, Tokyo University, Tokyo/Shinozuka, Yarkoni
- Fetal graphical trending
- Growth percentiles
- Multi-gestational calculations (four)
- Fetal qualitative description (anatomical survey)
- Fetal environmental description (biophysical profile)
- Programmable OB tables
- Over 20 selectable OB calculations
- Expanded worksheets

GYN Measurements/Calculations

- Right ovary length, width, height
- Left ovary length, width, height
- Uterus length, width, height
- Cervix length, trace
- Ovarian volume
- ENDO (endometrial thickness)
- Ovarian RI
- Uterine RI
- Follicular measurements
- Summary reports

Abdominal Measurements/Calculations

- Splenic index
- Liver volume, mass, cyst
- Pancreas
- CBD
- GB wall, length
- Aorta prox, mid, dist
- Aorta iliac
- Spleen volume
- Bladder, post void bladder volume
- Renal
- Cortex thickness
- Mesenteric (CA, SMA, IMA)

Safety Conformance

The Vivid S70N is built to meet the requirements of:

- IEC60601-2-37
- IEC60601-1
- IEC60601-1-2
- IEC62366-1
- IEC60601-1-6
- UL60601-1
- NEMA UD3
- The European Medical Devices Regulation, 2017/745/EC (CE Mark)
- Directive 2011/65/EU on the restriction of use of certain hazardous substances
- The Vivid S70N ultrasound unit is a Class I device, with BF (probes) and CF

(ECG leads) applied parts according to IEC60601-1

- The Vivid S70N ultrasound unit meets the EMC requirements in IEC/EN60601-1-2:2007 Class B

Privacy & Security

Virus Protection

To reduce virus vulnerability, Vivid S70N is configured with a minimal set of open ports and with all network services not actively used by the system closed down. This helps to reduce the risk of a virus attack on Vivid S70N.

GE Healthcare is continuously judging the need for additional actions to reduce vulnerability of equipment; this includes vulnerability scanning of our products and evaluation of new security patches for the 3rd-party technology used. Microsoft® (and other) security patches that address serious issues with Vivid S70N will be made available to customers after GE Healthcare verification of those patches.

Whitelisting

- Prevents non-listed applications from running
- To improve protection against potentially harmful software

User Policies

- Secure and advanced user password and login scheme according to user's password requirements

LDAP

- Users can log in to the system by using the same user credentials as used for domain connected computers

Disc Encryption

- Optional encryption of the scanner's E drive containing patient identifiable data

User Management

- Last login information
- Customer configurable login banner
- Manually invoke screen log (WIN+L)

Microsoft OS Patches

- OS vulnerability patches are distributed as part of regular SW maintenance releases during the life cycle of the product.

Service / Life cycle Offerings

Insite™ Express Connection (ExC)

- Enables Remote Service and Training
- Easy, flexible and secure connectivity configuration. The “Contact GE” on-screen button directly generates a real-time service request to the GE Healthcare online engineering or application specialist. It takes a snapshot (e.g., error logs, setup files) of the system at the time of the service request to enable analysis of problem before customer contact
- Virtual Console Observation (VCO) enables the customer to allow desktop screens to be viewed and controlled remotely over the encrypted tunnel to enable real-time training and device configuration
- Operation of Insite Express Connection is dependent on the infrastructure being available – check with your local GE Healthcare service representative
- File transfer enables the customer (biomed or clinician) to directly transfer system information (e.g., system logs, images, parametric data) to GE Healthcare product engineering teams (no patient data transferred)
- Software reload provides remote application reconstruction and recovery capabilities in the event of system corruption

Smart Service Interface (SSI) (optional)

- A suite of GE Healthcare proprietary service tools, designed for expert Healthcare Technology Management Professionals who want to streamline troubleshooting and diagnostics on their GE Healthcare Vivid systems
- Provides an intelligent visual dashboard with drill-down capability to rapidly assess equipment status and health
- Can drive productivity by quickly isolating specific issues and decreasing overall system downtime
- SSI is available for licensed qualified users. Please contact your local sales representative for more information

eDelivery (optional)[5]

- eDelivery facilitates download of software patches for service purpose (e.g., security patches)
- It is also an enabler for the ability to download apps from the AppStore

Digital Expert (optional)[5]

- Enables the user to connect remotely to a GE Healthcare Clinical Specialist to receive application-related training and help

Imaging Insights

- Support of Imaging Insights offering by providing system utilization data

Probe Check (optional)[6]

- Automated transducer element check and reporting of potential image quality impact

[5] *eDelivery and Digital Expert may not be available in all countries and regions. Consult with a GE Healthcare representative for more details.*

[6] *Probe Check is offered as a standard feature in USA to comply with FDA requirements. It may be available in other regions. Consult with a GE Healthcare representative for more details*

Transducers






Name	M5Sc-D	6S-D	12S-D	3Sc-RS	9L-D	11L-D
Catalog#	H44901AE	H45021RR	H45021RT	H45041DL	H40442LM	H40432LN
Description	XDclear™ Active Matrix Single Crystal Phased Array Transducer	Phased Array Transducer	Phased Array Transducer	Phased Array Transducer	Linear Array Transducer	Linear Array Transducer
Number of elements	240	96	96	64	192	192
Foot Print	18 x 27 mm	17 x 24 mm	13 x 18 mm	18 x 24 mm	14 x 53 mm	13 x 47 mm
Max. Bandwidth	1 - 5 MHz	2 - 8 MHz	3 - 12 MHz	1 - 5 MHz	2 - 10 MHz	4 - 12 MHz
Field of View	120°	115°	105°	120°	45 mm	39mm
Depth of Field	36 cm	16 cm	12 cm	36 cm	16 cm	8 cm
Biopsy Guide Available	Multi-angle disposable with a reusable bracket	N/A	N/A	Multi-angle disposable with a reusable bracket	Multi-angle disposable with a reusable bracket	Multi-angle disposable with a reusable bracket
Application						
Fetal/Obstetrics	+	+		+		
Abdominal [1]	+	+	+	+	+	
Thoracic/Pleural	+	+		+	+	+
Pediatric	+	+	+	+	+	+
Small Organ[2]					+	+
Neonatal Cephalic		+	+			
Adult Cephalic	+			+		
Cardiac[3]	+	+	+	+		
Peripheral Vascular	+		+	+	+	+
Musculo-skeletal Conventional					+	+
Musculo-skeletal Superficial					+	+
Urology[4]	+					
Transesophageal						
Transvaginal						
Transrectal						
Intra-cardiac and Intra-luminal						
Intraoperative (Vascular)						
Interventional Guidance[5]	+			+	+	+

Transducers



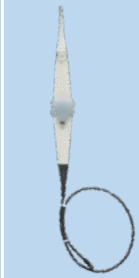



Name	ML6-15-D	L8-18i-D	C1-5-D	C1-6-D	C2-9-D	C3-10-D
Catalog#	H40452LG	H40452LL	H40452LE	H40472LT	H40462LN	H40482LB
Description	Active Matrix Wide Band Linear Array Transducer	Intraoperative Linear Array Transducer	Curved Array Transducer	XDclear Single Crystal Curved Array Transducer	XDclear Single Crystal Curved Array Transducer	XDclear Single Crystal Tightly Curved Array Transducer
Number of elements	1008	168	192	192	192	192
Foot Print	16 x 61 mm	11 x 35 mm	17 x 69 mm	16 x 70 mm	14 x 51 mm	12 x 22 mm
Max. Bandwidth	4 - 15 MHz	5 - 18 MHz	1 - 6 MHz	1 - 6 MHz	2 - 9 MHz	3 - 10 MHz
Field of View	50 mm	25mm	70°	70°	65°	95°
Depth of Field	8 cm	10 cm	50 cm	50 cm	30 cm	14 cm
Biopsy Guide Available	Ultra-ProII™ In-Plane Ultrasound Needle Guides Multi-Angle	N/A	Multi-angle disposable with a reusable bracket	Multi-angle disposable with a reusable bracket	Multi-angle disposable with a reusable bracket	N/A
Application						
Fetal/Obstetrics			+	+	+	
Abdominal [1]			+	+	+	+
Thoracic/Pleural			+	+		
Pediatric					+	+
Small Organ[2]	+	+				
Neonatal Cephalic						+
Adult Cephalic						
Cardiac[3]						
Peripheral Vascular	+	+	+	+	+	+
Musculo-skeletal Conventional	+	+				+
Musculo-skeletal Superficial		+				+
Urology[4]			+	+	+	
Transesophageal						
Transvaginal						
Transrectal						
Intra-cardiac and Intra-luminal						
Intraoperative (Vascular)		+				
Interventional Guidance[5]	+		+	+	+	+

Transducers

Name	iC5-9-D	P2D	P6D	4Vc-D	6VT-D	6Tc-RS
Catalog#	H40442LK	H4830JE	H4830JG	H40482LS	H45581BJ	H45551ZE
Description	Tightly Curved Array Transducer	Pencil Transducer	Pencil Transducer	XDclear Single Crystal Active Matrix 4D Volume Phased Array Transducer	Active Matrix 4D Volume TEE Transducer	TEE Transducer
Number of elements	192	2	2	6000	2500	64
Foot Print	17 x 21 mm	N/A	N/A	18x29 mm	Tip(LxWxH) 45x14x13 mm	Tip(LxWxH) 45x14x12mm
Max. Bandwidth	3 - 9 MHz	2 MHz	7 MHz	1 - 5 MHz	3 - 8 MHz	3 - 8 MHz
Field of View	128°	N/A	N/A	90°	90°	90°
Depth of Field	30 cm	N/A	N/A	36 cm	20 cm	20 cm
Biopsy Guide Available	Single angle, disposable	N/A	N/A	Multi-angle disposable with a reusable bracket	N/A	N/A
Application						
Fetal/Obstetrics	+			+		
Abdominal [1]				+		
Thoracic/Pleural				+		
Pediatric				+		
Small Organ[2]						
Neonatal Cephalic						
Adult Cephalic				+		
Cardiac[3]		+	+	+	+	+
Peripheral Vascular		+	+			
Musculo-skeletal Conventional						
Musculo-skeletal Superficial						
Urology[4]	+			+		
Transesophageal					+	+
Transvaginal	+					
Transrectal	+					
Intra-cardiac and Intra-luminal						
Intraoperative (Vascular)						
Interventional Guidance[5]	+			+		

Transducers




Name	9T-RS	10T-D	NUVISION™ Connector Cable **	NUVISION Ultrasound Catheter **	ICE Cord-RS	AcuNav8F***
Catalog#	H45531YM	H44901AH	Distributed by Biosence Webster, Inc.	Distributed by Biosence Webster, Inc.	H48952AR	Distributed by Biosence Webster, Inc.
Description	TEE Transducer	TEE Transducer	Connector Cable	Intra Cardiac Active Matrix Phased Array 4D Volume Catheter	Connector Cable	Intra Cardiac Phased Array Catheter
Number of elements	44	32	N/A	840	N/A	64
Foot Print	Tip(LxWxH) 35x11x8 mm	Tip(LxWxH) 16x8x6 mm	N/A	10F	N/A	8 Fr diameter
Max. Bandwidth	3 - 10 MHz	3 - 10 MHz	N/A	4 - 10 MHz	N/A	4 - 12 MHz
Field of View	90°	90°	N/A	90°	N/A	90°
Depth of Field	14 cm	18 cm	N/A	20 cm	N/A	16 cm
Biopsy Guide Available	N/A	N/A	N/A	N/A	N/A	N/A
Application						
Fetal/Obstetrics						
Abdominal [1]						
Thoracic/Pleural						
Pediatric						
Small Organ[2]						
Neonatal Cephalic						
Adult Cephalic						
Cardiac[3]	+	+				
Peripheral Vascular						
Musculo-skeletal Conventional						
Musculo-skeletal Superficial						
Urology[4]						
Transesophageal	+	+				
Transvaginal						
Transrectal						
Intra-cardiac and Intra-luminal				+		+
Intraoperative (Vascular)						
Interventional Guidance[5]						

Transducers

Name	AcuNav10F***	Sound Star 3D 10F***	Sound Star eco 10F***	Sound Star eco 8F***
Catalog#	Distributed by Biosence Webster, Inc.	Distributed by Biosence Webster, Inc.	Distributed by Biosence Webster, Inc.	Distributed by Biosence Webster, Inc.
Description	Intra Cardiac Phased Array Catheter	Intra Cardiac Phased Array Catheter	Intra Cardiac Phased Array Catheter	Intra Cardiac Phased Array Catheter
Number of elements	64	64	64	64
Foot Print	10 Fr diameter	10 Fr diameter	10 Fr diameter	8 Fr diameter
Max. Bandwidth	4 - 12 MHz	4 - 12 MHz	4 - 12 MHz	4 - 12 MHz
Field of View	90°	90°	90°	90°
Depth of Field	16 cm	16 cm	16 cm	16 cm
Biopsy Guide Available	N/A	N/A	N/A	N/A
Application				
Fetal/Obstetrics				
Abdominal [1]				
Thoracic/Pleural				
Pediatric				
Small Organ[2]				
Neonatal Cephalic				
Adult Cephalic				
Cardiac[3]				
Peripheral Vascular				
Musculo-skeletal Conventional				
Musculo-skeletal Superficial				
Urology[4]				
Transesophageal				
Transvaginal				
Transrectal				
Intra-cardiac and Intra-luminal	+	+	+	+
Intraoperative (Vascular)				
Interventional Guidance[5]				

[1] Abdominal including renal, GYN

[2] Small Organ including breast, testes, thyroid

[3] Cardiac including Adult and Pediatric

[4] Urology including prostate

[5] Interventional Guidance including Biopsy, Vascular Access

NOTE:

** 6VT-D with catalog #H45561TA is also supported*

** *Not available in all countries. Please contact Biosense Webster, Inc. for availability.*

*** *Not available in all countries. Please contact Biosense Webster, Inc. for availability.*

Product may not be available in all countries and regions. Full product technical specification is available upon request. Contact a GE Healthcare Representative for more information. Please visit www.gehealthcare.com/promotional-locations.

Data subject to change.

About GE Healthcare

GE Healthcare is a leading global medical technology and digital solutions innovator. GE Healthcare enables clinicians to make faster, more informed decisions through intelligent devices, diagnostic pharmaceuticals, data analytics, applications and services, supported by its Edison intelligence platform. With over 100 years of healthcare industry experience and around 50,000 employees globally, the company operates at the center of an ecosystem working toward precision health, digitizing healthcare, helping drive productivity and improve outcomes for patients, providers, health systems and researchers around the world. Follow us on Facebook.com, LinkedIn.com, Twitter.com and Insights.com or visit our website www.gehealthcare.com for more information.

GE Healthcare

9900 Innovation Drive Wauwatosa, WI 53226

U.S.A.

www.gehealthcare.com

8-7-4 Swivel and Up-Down Handle Replacement Procedure

8-7-4-1 Tools

Flat and Phillips screwdrivers as needed.

8-7-4-2 Time Required

60 min

8-7-4-3 Preparation

Shut down the ultrasound system as described in Power Shut Down on page 4 - 9.

8-7-4-4 Swivel and Up-Down Handle Removal Procedure

1) Remove the Operating Panel as described in the Operating Panel Keyboard Assembly Removal Procedure on page 8 - 43.
2) Remove the Probe Shelf as described in the Probe Shelf Removal Procedure on page 8 - 157.
3.) Unscrew the handle shaft support. Rotate it upwards 90 degrees to remove the support by sliding it to the left or right side.

Figure 8-128 Protective Metal Plate Rotated 90 Degrees

Vivid S70N
Ultra Edition 2022

EMEA Product Tree

Release C

26/August/2022

Table of Contents

System Overview

Probes:

- 4Vc-D
- M5Sc-D
- 3Sc-RS
- 6S-D
- 12S-D
- 9L-D
- 11L-D
- ML6-15-D
- L8-18i-D
- C1-5-D
- C1-6-D
- C2-9-D
- C3-10-D
- IC5-9-D

Probes:

- 6VT-D
- 6Tc-RS
- 9T-RS
- 10T-D
- ICE Cord-RS
- P2D
- P6D

Software Options:

- 4D
- HD Color
- 4D Auto MVQ
- 4D Auto AVQ
- 4D Auto RVQ for 6VT volumes
- 4D Markers
- AI Auto Measure 2D
- AI Auto Measure Spectrum
- Smart Stress
- AutoEF 3.0
- Easy AutoEF

Software Options:

- AFI 3.0
- Easy AFI LV
- AFI RV
- AFI LA
- Advanced Qscan
- Low MI contrast
- Vascular Contrast
- GE DICOM Media Viewer
- ICE probe module
- CartoSound interface
- 4D ICE enable
- Rodent
- eDelivery

Hardware Options:

- Smart Standby
- Universal Power Supply (UPS)
- USB Footswitch
- WIFI kit
- Video adapter
- DVDRW drive

ECG Options:

- ECG cable and adaptor

Connectivity Options:

- Streaming
- Tricefy Connect
- Remote Viewing
- View-X

Printers:

- BW Printer Kit
- Color video printer
- Network Printer

Accesssories:

- Biopsy kits
- TEE bite guards and protections
- TEE bite hole indicator
- Storage Box

Base system

Item Number	Description	Description/Comments
H45611MY	Vivid S70N Ultra Edition 2022 NOR *with eDelivery*	Vivid S70N Ultra Edition 2022 including eDelivery, country kit and ecg cable must be ordered separately Standard for most countries if eDelivery is released in the country
H45611NC	Vivid S70N Ultra Edition 2022 NOR *without eDelivery*	Vivid S70N Ultra Edition 2022, country kit and ecg cable must be ordered separately Standard for most countries if eDelivery is **NOT** released in the country
H45611MW	Vivid S70N Ultra Edition 2022 CN *with eDelivery*	Vivid S70N Ultra Edition 2022 including eDelivery, country kit and ecg cable must be ordered separately Only if NOR system can't be used and eDelivery is released in the county
H45611NA	Vivid S70N Ultra Edition 2022 CN *without eDelivery*	Vivid S70N Ultra Edition 2022, country kit and ecg cable must be ordered separately Only if NOR system can't be used and eDelivery is **NOT** released in the county

Standard Features:

Frequency Compound

Elevation Compound (6VT)

LVO Contrast

TVI/TT

Anatomical M-mode / Curved anatomical M-mode

LOGIQ View

IMT

Q Analysis

Biplane / Triplane

Standard Features:

ScanAssist

DICOM Connectivity Package

TEE Interface

4Vc-Enable

B-Flow/BFI

Spline Area Tool

Strain Elastography

Imaging Insights

Image View

Standard Features:

Pre-Post Compare

Card. Auto Doppler

Ob measurements

Z scores for Pediatrics

Patient Archive

Report Designer

Respiration

DICOM Media support

ePAT

Manuals and Documentation

Manuals - Mandatory

HCAT	Description	Description/Comments

Manuals - Optional

HCAT	Description	Description/Comments
H48542LD	AUM Booklet	
H45611TA	VS60N-S70N v206 UM - English	Paper user manual. Only order if paper manual is required at time of system delivery.
H45611TB	VS60N-S70N v206 UM - German	Paper user manual. Only order if paper manual is required at time of system delivery.
H45611TC	VS60N-S70N v206 UM - French	Paper user manual. Only order if paper manual is required at time of system delivery.
H45611TD	VS60N-S70N v206 UM - Spanish	Paper user manual. Only order if paper manual is required at time of system delivery.
H45611TE	VS60N-S70N v206 UM - Swedish	Paper user manual. Only order if paper manual is required at time of system delivery.
H45611TF	VS60N-S70N v206 UM - Norwegian	Paper user manual. Only order if paper manual is required at time of system delivery.
H45611TG	VS60N-S70N v206 UM - Danish	Paper user manual. Only order if paper manual is required at time of system delivery.
H45611TH	VS60N-S70N v206 UM - Dutch	Paper user manual. Only order if paper manual is required at time of system delivery.
H45611TJ	VS60N-S70N v206 UM - Russian	Paper user manual. Only order if paper manual is required at time of system delivery.
H45611TK	VS60N-S70N v206 UM - Ukrainian	Paper user manual. Only order if paper manual is required at time of system delivery.
H45611TL	VS60N-S70N v206 UM - Kazakh	Paper user manual. Only order if paper manual is required at time of system delivery.
H45611TM	VS60N-S70N v206 UM - Romanian	Paper user manual. Only order if paper manual is required at time of system delivery.
H45611TN	VS60N-S70N v206 UM - Serbian	Paper user manual. Only order if paper manual is required at time of system delivery.
H45611TP	VS60N-S70N v206 UM - Croatian	Paper user manual. Only order if paper manual is required at time of system delivery.

Manuals and Documentation

Manuals – Optional (continue)

HCAT	Description	Description/Comments
H45531RA	TEE Probes User Manual Eng,Fre,Ger,Chi	Only if TEE probe is sold with the system
H45531RD	TEE Probes User Manual Italian	Only if TEE probe is sold with the system
H45531RE	TEE Probes User Manual Spanish	Only if TEE probe is sold with the system
H45581AN	TEE Probes User Manual Port, Europe	Only if TEE probe is sold with the system
H45531RJ	TEE Probes User Manual Swedish	Only if TEE probe is sold with the system
H45531RK	TEE Probes User Manual Norwegian	Only if TEE probe is sold with the system
H45531RL	TEE Probes User Manual Danish	Only if TEE probe is sold with the system
H45531RM	TEE Probes User Manual Polish	Only if TEE probe is sold with the system
H45531RN	TEE Probes User Manual Finnish	Only if TEE probe is sold with the system
H45531RP	TEE Probes User Manual Greek	Only if TEE probe is sold with the system
H45531RQ	TEE Probes User Manual Russian	Only if TEE probe is sold with the system
H45531RR	TEE Probes User Manual Dutch	Only if TEE probe is sold with the system
H45541PL	TEE Probes User Manual Hungarian	Only if TEE probe is sold with the system

Manuals and Documentation

Manuals – Optional (continue)

HCAT	Description	Description/Comments
H45541PM	TEE Probes User Manual Slovakian	Only if TEE probe is sold with the system
H45541PN	TEE Probes User Manual Romanian	Only if TEE probe is sold with the system
H45541PP	TEE Probes User Manual Czech	Only if TEE probe is sold with the system
H45541PQ	TEE Probes User Manual Latvian	Only if TEE probe is sold with the system
H45541PR	TEE Probes User Manual Lithuanian	Only if TEE probe is sold with the system
H45541PT	TEE Probes User Manual Estonian	Only if TEE probe is sold with the system
H45551ZQ	TEE Probes User Manual Serbian	Only if TEE probe is sold with the system
H45551ZR	TEE Probes User Manual Bulgarian	Only if TEE probe is sold with the system
H45561RH	TEE probes User manual Croatian	Only if TEE probe is sold with the system
H45581PT	TEE Probes User Manual Slovenian	Only if TEE probe is sold with the system
H45581PL	TEE Probes User Manual Ukraine	Only if TEE probe is sold with the system
H45541PS	TEE Probes User Manual Turkish	Only if TEE probe is sold with the system
H45601HS	TEE Probes User Manual Kazak.	Only if TEE probe is sold with the system

Manuals and Documentation

Manuals – Optional (continue)

HCAT	Description	Description/Comments
H45601FB	10T-D Probe User Manual - English	Only if 10T probe is sold with the system
H45601FA	10T-D Probe User Manual - Norwegian	Only if 10T probe is sold with the system
H45601FD	10T-D Probe User Manual - French	Only if 10T probe is sold with the system
H45601FE	10T-D Probe User Manual - German	Only if 10T probe is sold with the system
H45601FF	10T-D Probe User Manual - Italian	Only if 10T probe is sold with the system
H45601FG	10T-D Probe User Manual - Spanish	Only if 10T probe is sold with the system
H45601FK	10T-D Probe User Manual - Swedish	Only if 10T probe is sold with the system
H45601FL	10T-D Probe User Manual - Danish	Only if 10T probe is sold with the system
H45601FM	10T-D Probe User Manual - Polish	Only if 10T probe is sold with the system
H45601FN	10T-D Probe User Manual - Finnish	Only if 10T probe is sold with the system
H45601FP	10T-D Probe User Manual - Greek	Only if 10T probe is sold with the system
H45601FR	10T-D Probe User Manual - Russian	Only if 10T probe is sold with the system
H45601FS	10T-D Probe User Manual - Dutch	Only if 10T probe is sold with the system
H45601FT	10T-D Probe User Manual - Hungarian	Only if 10T probe is sold with the system

Manuals and Documentation

Manuals – Optional (continue)

HCAT	Description	Description/Comments
H45601FW	10T-D Probe User Manual - Slovakian	Only if 10T probe is sold with the system
H45601FY	10T-D Probe User Manual - Romanian	Only if 10T probe is sold with the system
H45601FZ	10T-D Probe User Manual - Czech	Only if 10T probe is sold with the system
H45601HA	10T-D Probe User Manual - Latvian	Only if 10T probe is sold with the system
H45601HB	10T-D Probe User Manual - Lithuanian	Only if 10T probe is sold with the system
H45601HD	10T-D Probe User Manual - Estonian	Only if 10T probe is sold with the system
H45601HF	10T-D Probe User Manual - Serbian	Only if 10T probe is sold with the system
H45601HG	10T-D Probe User Manual - Bulgarian	Only if 10T probe is sold with the system
H45601HH	10T-D Probe User Manual - Slovenian	Only if 10T probe is sold with the system
H45601HK	10T-D Probe User Manual - Croatian	Only if 10T probe is sold with the system
H45601HL	10T-D Probe User Manual - Portuguese Eu	Only if 10T probe is sold with the system
H45601HM	10T-D Probe User Manual - Ukrainian	Only if 10T probe is sold with the system
H45601HN	10T-D Probe User Manual - Kazakh	Only if 10T probe is sold with the system
H45601HC	10T-D Probes User Manual Turkish	Only if 10T probe is sold with the system

Keyboards

Keyboards and Key Cap Language Kits

HCAT	Description	Description/Comments
H45591JA	A/N keybd – English Int.	For factory and field installation
H45591JB	A/N keybd – German	For factory and field installation
H45591JC	A/N keybd – French	For factory and field installation
H45591JD	A/N keybd – Spanish	For factory and field installation
H45591JE	A/N keybd – Italian	For factory and field installation
H45591JF	A/N keybd – Portuguese	For factory and field installation
H45591JG	A/N keybd – Russian	For factory and field installation

Power cords and Destination Sets

Mandatory

HCAT	Description	Description/Comments
H45591LA	Country Kit, Std. EU	
H45591LB	Country Kit, Germany	
H45591LC	Country Kit, France	
H45591LD	Country Kit, Italy	
H45591LE	Country Kit, Spain	
H45591LF	Country Kit, Portugal	
H45591LG	Country Kit, Sweden	
H45591LH	Country Kit, Norway	
H45591LJ	Country Kit, Finland	
H45591LK	Country Kit, Netherlands	
H45591LL	Country Kit, Greece	
H45591LN	Country Kit, Den.	
H45611SW	Country Kit, Switzerland FR	
H45611SY	Country Kit, Switzerland DE	
H45611SX	Country Kit, Switzerland IT	
H45591LW	Country Kit, UK	
H45591MF	Country Kit, Israel	
H45591MG	Country kit, Russia	
H45591YA	Country Kit, Eurasian CU	
H45591MB	Country Kit, South Africa	
H45581RT	Country kit, Ukraina	

Power cords and Destination Sets

Optional

HCAT	Description	Description/Comments
H45591CT	Power Cable EU	Only for external peripherals
H45591AT	Power Cable UK	Only for external peripherals
H45591AP	Power Cable Denmark	Medical grade power cable (red), only for external peripherals
H45591CS	Power Cable SUI	Only for external peripherals
H45591AS	Power Cable Israel	Only for external peripherals
H45601SR	Power Cable India, South Africa	Only for external peripherals

Probes

HCAT	Description	Description/Comments
4D XDClear electronic Sector Phased Array		
H40482LS	4Vc-D	Only works in 2D and biplane / triplane
2D XDClear Sector Phased Array		
H44901AE	M5Sc-D	
2D Sector Phased Array		
H45041DL	3SC-RS	
H45021RR	6S-D	
H45021RT	12S-D	
2D XDClear Linear Array		
H40452LG	ML6-15-D	
2D Linear Array		
H40442LM	9L-D	
H40432LN	11L-D	
H40452LL	L8-18i-D	

Probes (continue)

HCAT	Description	Description/Comments
2D XDClear Curved Array		
H40472LT	C1-6-D	
H40462LN	C2-9-D	
H40482LB	C3-10-D	
2D Curved Array		
H40452LE	C1-5-D	
2D Endocavity		
H40442LK	iC5-9-D	
Special probes		
H48952AR	ICEcord-RS w. Ferrite filter	Requires ICE Probe Interface H45591RE Catheters (AcuNav and Soundstar) need to be ordered from Biosense Webster™
Doppler pencil probes		
H4830JE	P2D	
H4830JG	P6D	

TEE Probes

HCAT	Description	Description/Comments
TEE adult probes		
H45581BJ	6VT-D	Operates in multiplane and bi-/triplane. With option H45581PG (4D option) also 4D imaging
H45551ZE	6Tc-RS	
TEE pediatric probes		
H45531YM	9T-RS	
H44901AH	10T-D	

TEE accessories

HCAT	Description	Description/Comments
H45511EE	TEE Clip-On Bite Guard Adult	Supporting adult TEE investigation used for patients under general anaesthesia during surgery.
H45521CB	TEE Clip-On Bite Guard Adult OR	Supporting adult TEE investigation used for patients under general anaesthesia during surgery.
H45521JH	TEE Conventional Bite Guard Adult	Conventional Bite Guard supporting adult TEE investigation.
H45521CK	Adult TEE Scanhead Protection Cover	Cover scanhead for protection during transportation
H45521JG	TEE Conventional Bite Guard Pediatric	Conventional Bite Guard supporting adult TEE investigation.
H45541RN	Pediatric TEE Scanhead Protection Cover	Supporting adult TEE investigation used for patients under general anaesthesia during surgery.
H45551NM	TEE Storage Rack	For storage of Adult and Pediatric TEE probes, wall mounted. Store disinfected probes, ready for next use.
H45531HS	Bite Hole Indicator	

Biopsy Guides

HCAT	Description	Description/Comments
Biopsy Options 4D Sector Phased Array		
H40482LP	4Vc-D Multi Angle Biopsy kit	
Biopsy Options 2D Sector Phased Array		
H45561FC	M5Sc-RS Biopsy Kit	Civco Ref. # 442-180
H46222LC	3Sc-RS Biopsy Starter Kit	Civco Part # 742-370
Biopsy Options 2D Linear Array		
H40432LC	11L Biopsy kit	Civco Part # 742-335
H4906BK	9L Bio Guide Starter Kit	Civco Part # 742-335
H40432LJ	ML6-15 Biopsy Starter Kit	Civco Ref. # 442-172
Biopsy Options 2D Curved Array		
H4913BB	C1-6-D Biopsy Bracket	Civco Ref. # 442-213
H4913BA	C2-9-D Bipsy Bracket	Civco Ref. # 442-210
H40432LE	C1-5-D Biopsy kit	Civco Ref. # 442-174
Biopsy Options 2D Endocavity		
E8385MJ	iC5-9-D Needle guide	Civco Ref.# 134-125

Software

HCAT	Description	OAC	Description/Comments
H45581PG	4D	X	Includes FlexiViews and 4D Auto LVQ on 6VT volumes, no 4D strain
H45601ZG	HD Color	X	
H45591AD	4D Auto MVQ	X	
H45581CL	4D Auto AVQ	X	
H45591AE	4D Auto RVQ	X	
H45601GK	4D Markers	X	
H45601TV	NuVision 4D ICE Enable	X	Enable option only. Connector cable and catheters need to be ordered from Biosense Webster™ The NUVISION Ultrasound Catheter is not available in all countries.
H45601YX	AI Auto Measure -2D	X	
H45601YY	AI Auto Measure - Spectrum Recognition	X	
H45551WK	Smart Stress	X	
H45601YK	Auto EF 3.0	X	
H45611MM	Easy Auto EF	X	Requires H45601YK (Auto EF 3.0)

Software (continue)

HCAT	Description	OAC	Description/Comments
H45601WG	AFI 3.0	X	
H45611MP	Easy AFI LV	X	Requires H45601WG (AFI 3.0)
H45611HW	Auto EF 3.0 and AFI 3.0 bundle	X	Contains Auto EF 3.0 and AFI 3.0
H45611YL	Easy AFI and EF bundle	X	Contains Auto EF 3.0 , Easy Auto EF , AFI 3.0 and Easy AFI LV
H45601TT	AFI RV	X	
H45601TU	AFI LA	X	
H45561RK	Advanced Qscan imaging	X	
H45571GY	Advanced Contrast Imaging (Low MI)	X	
H45561MZ	Vascular Contrast	X	
H45591RE	ICE interface	X	
H45591RF	CartoSound interface	X	Requires ICE Probe Interface H45591RE and ICE cord H48952AR Must order a power cord. Isolated video splitter is included.
H48532BS	Ultrasound DICOM viewer	X	

Hardware Options

HCAT	Description	Description/Comments
H45051AB	Smart Standby - Battery	
H45601ZC	DVD RW	
H45611JF	UPS 220-240V 50/60Hz for Vivid S / Vivid E-series	The UPS is only available in RA-cleared countries. Uninterruptible power supply. Comes with an EU type power cable. No other type of power cable is currently available with the UPS. Requires UPS Support Kit H45611JG
H45611JG	Vivid S series UPS Support Kit	UPS AC output cable for connection between the UPS and the ultrasound system.
H46732LF	Tripedal footswitch	
H48982AN	Isolated HDMI video converter/splitter	

ECG and Connectivity

HCAT	Description	OAC	Description/Comments
ECG Options			
H45601SD	ECG cable, adult, IEC		Cable only, requires lead set
H45601SE	ECG lead set, adult, IEC		Used together with H45601SD
H45601SG	ECG cable, neo, IEC		3.6 m. Used together with neonatal leads H45601SJ
H45571RK	Lead/electr neo IEC 600		
H45601SK	Adapter, ECG 3-lead		ECG Cable Adapter, Multi-link 3-lead DIN adapter Adapter to use adult ECG cable H45601SD with neonatal ECG leads/electrodes H45571RK.
H45021LL	External ECG Cable		Set of various cables and connectors to enable connection of ECG from stress treadmills and ECG monitors to our Vivid scanner
Connectivity Options			
H45611MR	Remote Viewing	X	
H45591AK	View-X		
H45061GW	Tricefy connectivity	X	
H45601GJ	Streaming	X	
H45591HS	WiFi Kit		Wireless external G type USB adapter with extension cable and hardware for rear panel mounting

Printer and Other Peripherals

HCAT	Description	Description/Comments
Printers		
H45601YZ	USB B/W video printer	Sony UP-D898MD
H45601ZB	USB B/W printer support	Included in H45601YZ. Only needed if the b/w printer is purchased separately
H45561AA	Color Video Printer	Printer comes with EU type power cord. Any other power cord needed must be ordered separately
H45541MJ	Color Laser Printer 220V	HP Laserjet Pro 400 - M451dn, 220 V Version
H45541MH	Color Laser Printer 110V	HP Laserjet Pro 400 - M451dn, 110 V Version
Printer Paper		
Peripherals/Accessories		
H45551MH	Stereo Glasses for 3D visualization, Set	
H45551MJ	Spectacle Casing	
H45551MK	Anacrome 3D glasses	
H45551ML	Anacrome 3D glasses Clip-On Flips	
H45051AC	Storage box	

VNAV

Not available

Upgrades

HCAT	Description	Description/Comments
H45611NF	Vivid S60N and S70N v203 v204 v205 to v206 Upgrade *with eDelivery*	Upgrades R3, R4 and R5 systems to R6. Not compatible with R1 and R2 systems. Software upgrade only. To be used if eDelivery **IS** released in the country
H45611NE	Vivid S60N and S70N v203 v204 v205 to v206 Upgrade *without eDelivery*	Upgrades R3, R4 and R5 systems to R6. Not compatible with R1 and R2 systems. Software upgrade only. To be used if eDelivery **IS NOT** released in the country

Veterinary Use

HCAT	Description	OAC	Description/Comments
	For vet use please continue using Vivid S70N 204 version		

Revision History

Revision	Date	Author	Description/Comments
Draft	June 22, 2022	Christian Berger	Initial Release
Rev. A	July 14, 2022	Christian Berger	
Rev. B	July 28, 2022	Christian Berger	Removed vet options due to MDR regulatory
Rev. C	August 26, 2022	Christian Berger	Added H45611YL, Auto EF 3.0 and AFI 3.0 bundle

Appendix A

POWERED BY AI

ELEVATED BY YOU

Vivid™ S70N

Ultra Edition

Vivid

gehealthcare.com/vivid

WORKLOAD IS HIGH

Vivid S70N
Ultra Edition

WHILE ENERGY AND DETERMINATION PERSIST

By 2030,

▲**40.5%**

of the US population is projected to have some form of Cardiovascular Disease (CVD)[1]

▲**~108m**

annual echo exams performed globally[2]

90%

of sonographers experience symptoms of Work Related Musculoskeletal Disorders (WRMSD)[4]

Generating

▲**$120+billion**

yearly in direct and indirect costs for employers [4]

10-15%

of echo exams result in sub-optimal images[3]

1. Forecasting the Future of Cardiovascular Disease in the United State, AHA Policy Statement, 2011, source: CIR.0b013e31820a55f5
2. Source: Healthcare Infrastructure and Procedural Volume for Ultrasound Imaging, Frost & Sullivan, 2018. Approx. 108.12 million echo exams are performed annually; Calculation based on 26% total global prevalence of CVD cases (422 million) undergoing echo exam; extrapolated from US study indicating roughly 26% of total prevalent CVD cases underwent echo exams percentage value validated from reports.https://www.prb.org/wp-content/uploads/2015/12/2015-world-population-data-sheet_eng.pdf
3. Kurt M, Shaikh K, Peterson L, et al. Impact on contrast echocardiography on evaluation of ventricular function & clinical management in a large prospective cohort. J Am Coll Cardiol. 2009; 53(9):802-810
4. Work Related Musculoskeletal Disorders In Sonography, Society Of Diagnostic Medical Sonography, 2018, Susan Murphey, BS, RDMS, RDCS, CECD https://www.sdms.org/docs/default-source/Resources/work-related-musculoskeletal-disorders-in-sonography-white-paper.pdf?sfvrsn=8

Vivid S70N

Ultra Edition

Powered By Edison

Designed to provide you with uncompromised image quality, advanced visualization capabilities and easy measurements – while helping reduce tedious tasks and inter-observer variability.[1]

- 2D TTE and TEE, 4D TEE, and ICE imaging
- Wide range of imaging presets including cardiac, vascular, abdominal, and much more
- Intuitive, familiar user experience
- Automated workflow for streamlined scanning
- AI tools for speed, productivity and reproducibility
- Ergonomic design for user comfort

1. The Role of AI in Streamlining Echocardiography Quantification White Paper, Kristin McLeod - JB80498XX

MODERN ERGONOMICS

A familiar, yet modern and efficient design.

POWERED BY AI

Your time is precious. Save it.

Vivid S70N
Ultra Edition

AI Auto Measure 2D

- Powered by AI
- Caliper measurements can be completed with 3 clicks:
  Freeze – Measure – Auto
- Reproducible measurements will instantly appear on screen

LESS CLICKS [1]
UP TO 80 %

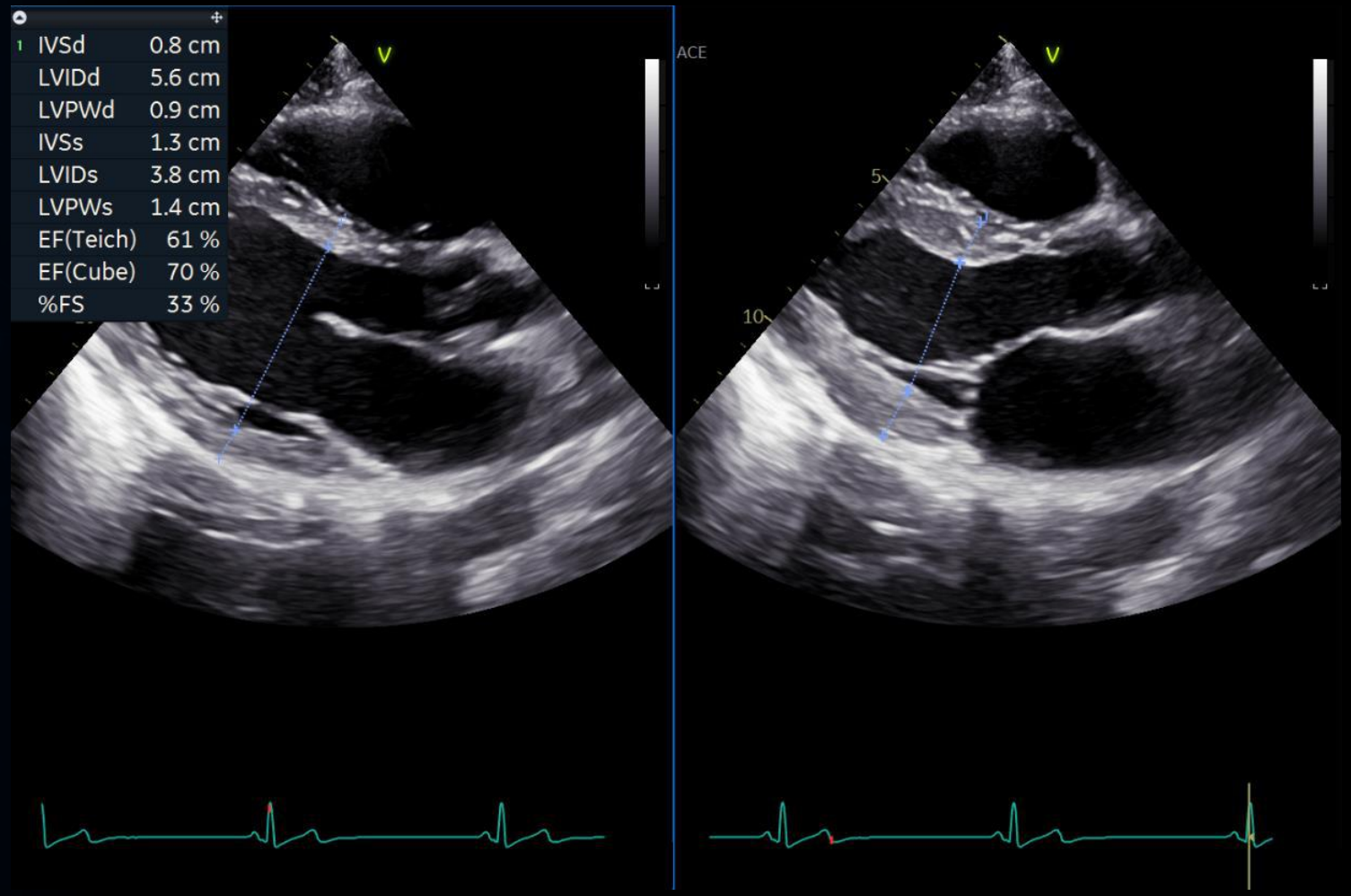
1. The Role of AI in Streamlining Echocardiography Quantification White Paper, Kristin McLeod - JB80498XX

POWERED BY AI

Your time is precious. Save it.

Vivid S70N
Ultra Edition

AI Auto Measure 2D



LESS CLICKS [1]
UP TO 80 %

APPLICATIONS POWERED BY AI

1. The Role of AI in Streamlining Echocardiography Quantification White Paper, Kristin McLeod - JB80498XX

POWERED BY AI

Your time is precious. Save it.

Vivid S70N
Ultra Edition

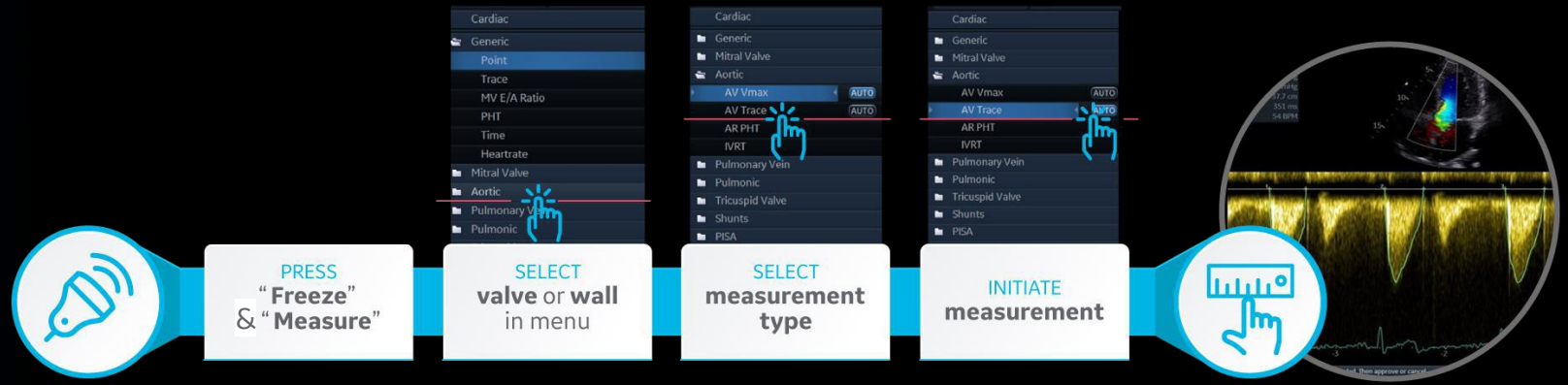
AI Auto Measure Spectrum Recognition

- Powered by AI
- Full range of Doppler Measurements in 2 clicks: **Freeze – Measure**
- Trace and measurements will instantly appear on screen

ACCURACY [1]
98 %

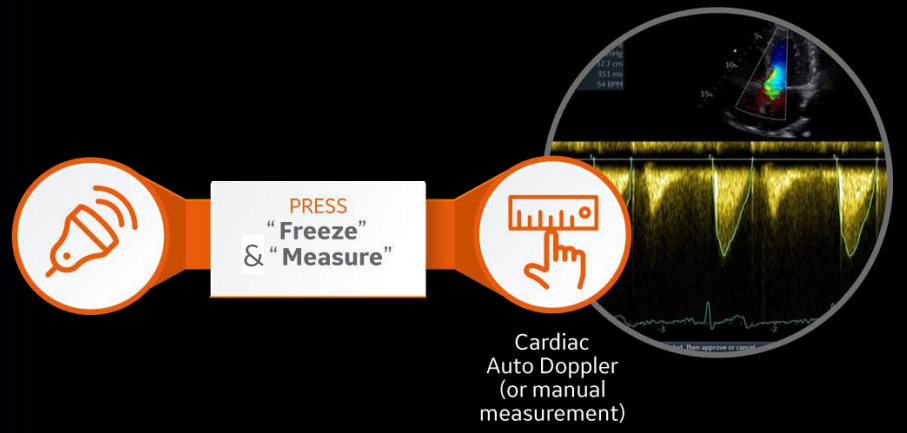
REPRODUCIBILITY [1]
100 %

STANDARD WORKFLOW



Cardiac
Auto Doppler
(or manual
measurement)

AI AUTO MEASURE SPECTRUM RECOGNITION WORKFLOW



Cardiac
Auto Doppler
(or manual
measurement)

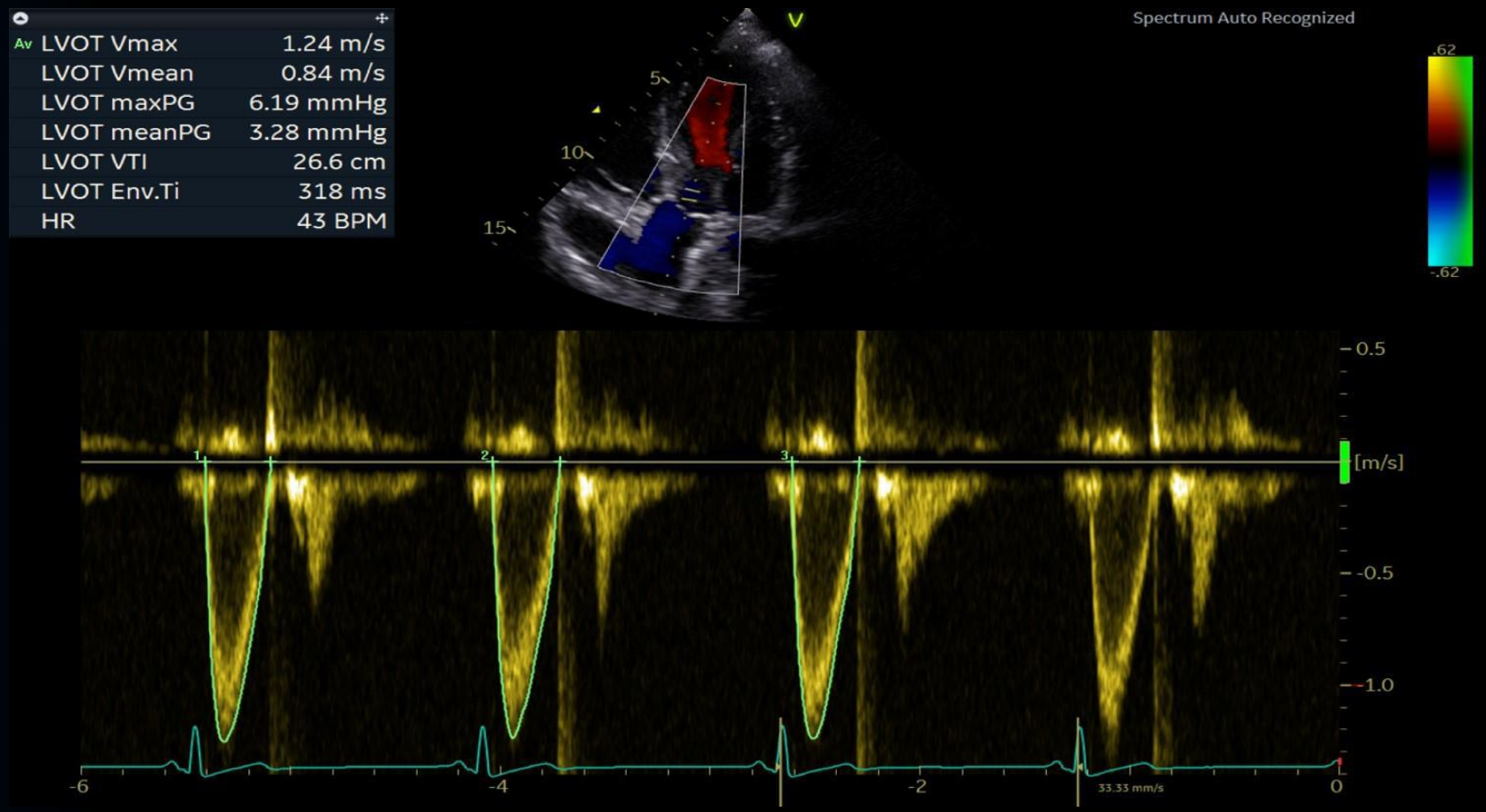
1. The Role of AI in Streamlining Echocardiography Quantification White Paper, Kristin McLeod - JB80498XX

POWERED BY AI

Your time is precious. Save it.

Vivid S70N
Ultra Edition

AI Auto Measure Spectrum Recognition



ACCURACY [1]
98 %

REPRODUCIBILITY [1]
100 %

APPLICATIONS POWERED BY AI

1. The Role of AI in Streamlining Echocardiography Quantification White Paper, Kristin McLeod - JB80498XX

POWERED BY AI

Your time is precious. Save it.

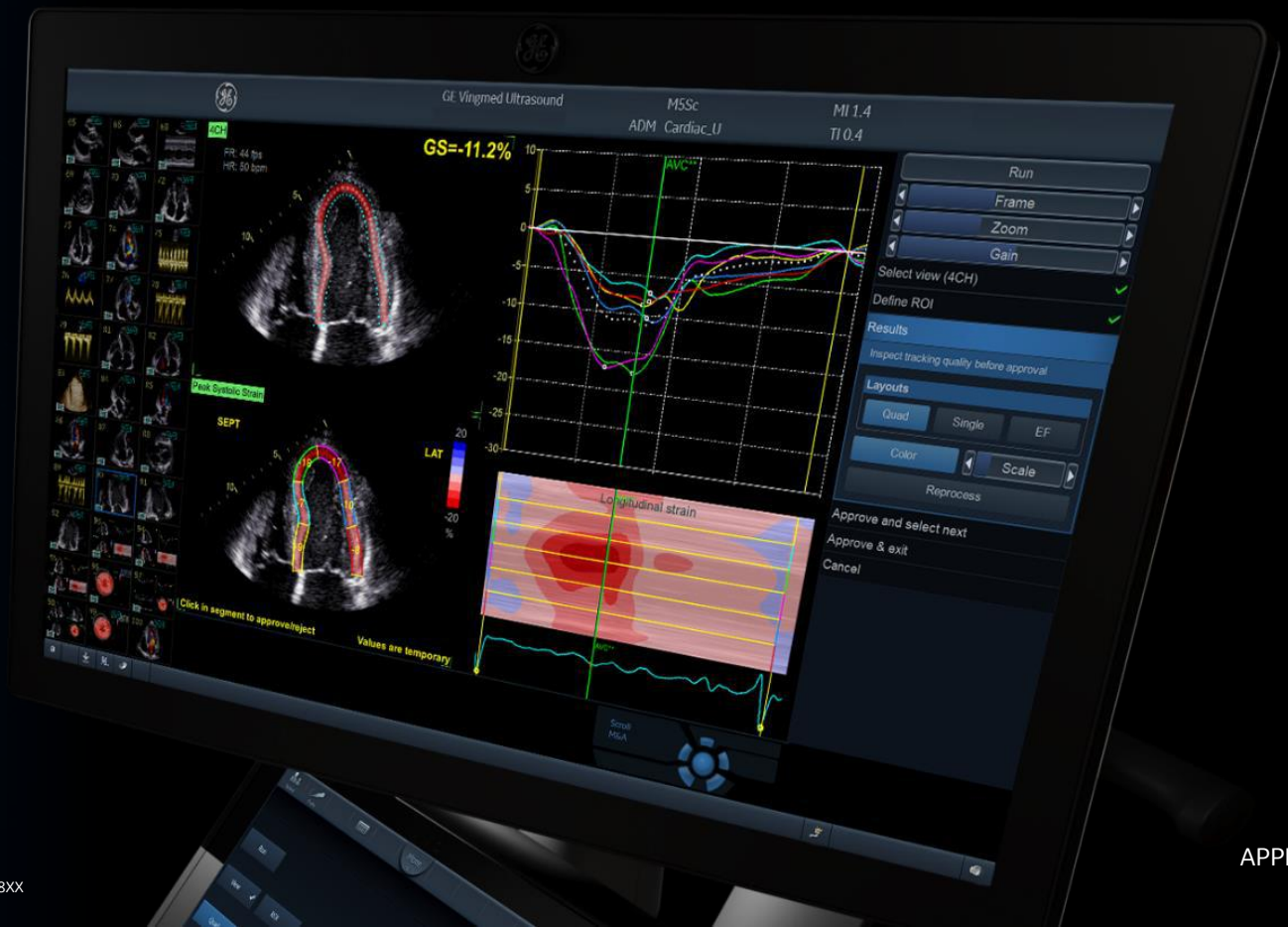
Vivid S70N
Ultra Edition

AI AFI LV with AI View Recognition

Fully automatic recognition of the apical imaging views and measurements of GLS and segmental longitudinal Strain for LV.

ACCURACY [1]
99 %

REPRODUCIBILITY [1]
100 %



1. The Role of AI in Streamlining Echocardiography Quantification White Paper, Kristin McLeod - JB80498XX

APPLICATIONS POWERED BY AI

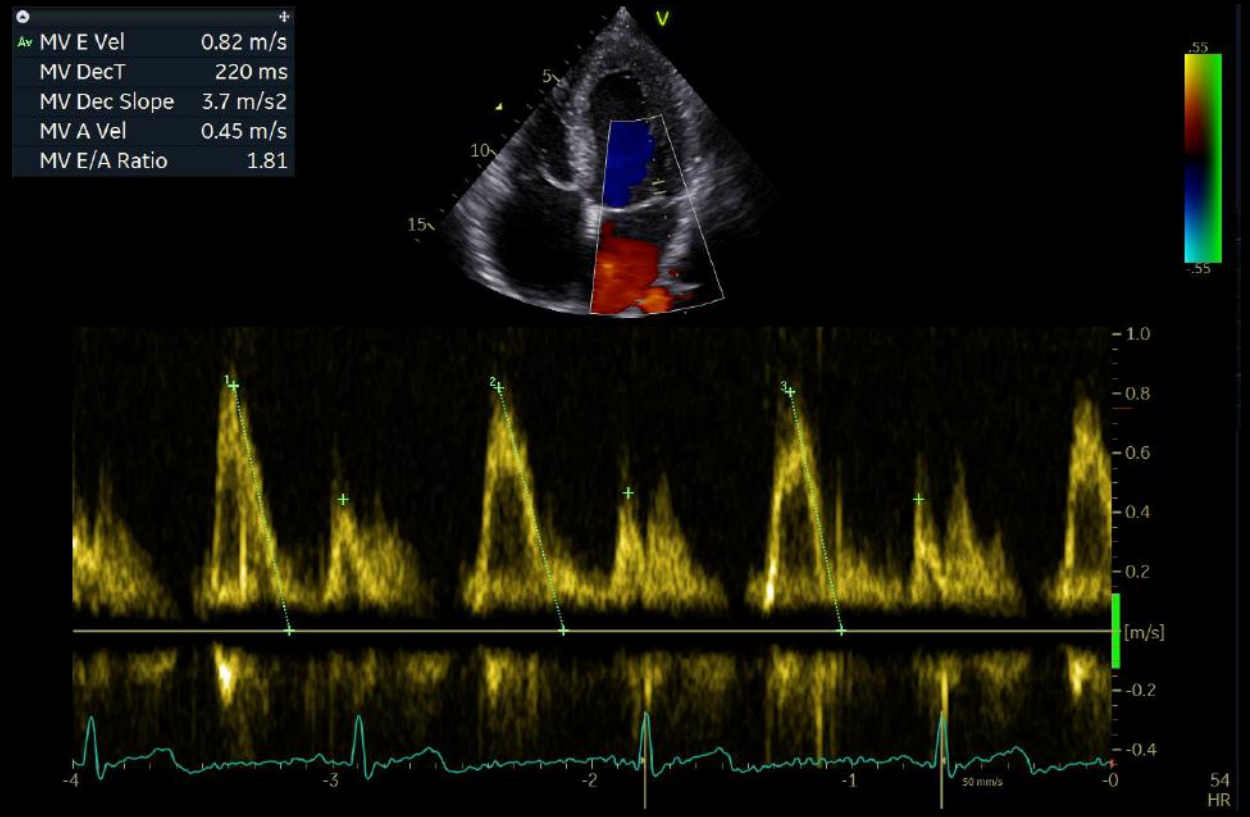
POWERED BY AI

Your time is precious. Save it.

Vivid S70N
Ultra Edition

AI Cardiac Auto Doppler with AI

Semi-automatic Cardiac Doppler measurements.



REDUCED TIME PER MEASUREMENT

UPTO 93%

Fewer Keystrokes [1]

LOWER INTER OPERATOR VARIABILITY

REDUCE VARIABILITY ~3x

Standardized exams with greater reproducibility [1]

ACCELERATED WORKFLOW

Productivity improvement

APPLICATIONS POWERED BY AI

1. Based on results of time and motion study conducted by GE "JB49055XX - Cardiac Auto Doppler"; study results indicated time savings related productivity increase up to ~8 on an annual basis for a facility per sonographer

CLINICAL EXCELLENCE
for the Echo Lab

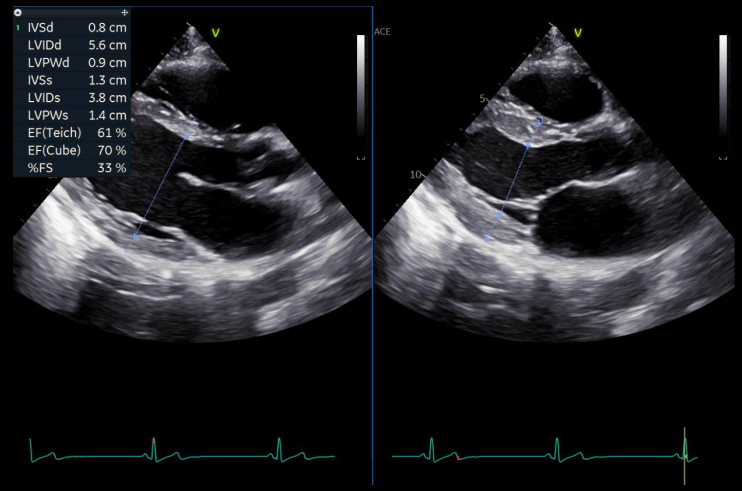
Vivid S70N
Ultra Edition

At GE Healthcare we aim to remove tedious tasks and help make every moment count for your patients.

AI Auto Measure 2D

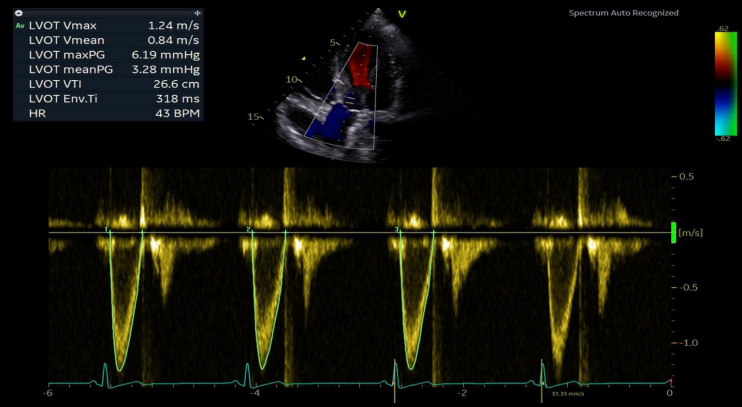
With the power of AI, the manual caliper measurements can be completed with 3 clicks: **Freeze – Measure – Auto.**

A full set of reproducible measurements will instantly appear on the screen.



AI Auto Measure Spectrum Recognition

With the power of AI, a wide range of Doppler measurements can be completed with 2 clicks: **Freeze – Measure.** A Doppler trace and full set of associated measurements will instantly appear on the screen.



Powered By Edison

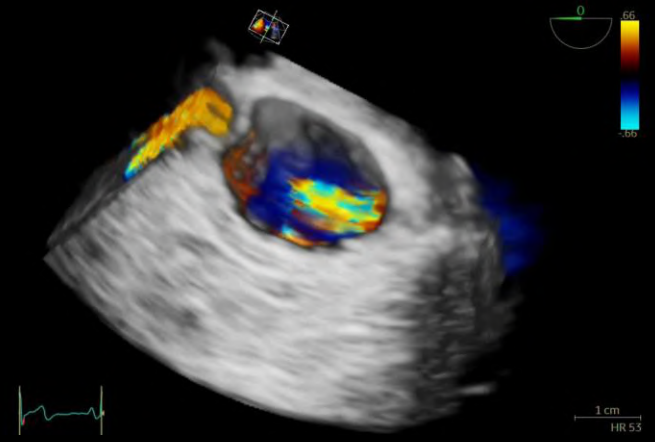
CLINICAL EXCELLENCE
for Interventional Procedures

Vivid S70N
Ultra Edition

Demand for interventional procedures is growing and so are expectations of the heart team. Grow your capacity and capabilities with advanced ultrasound and conquer difficult cases.

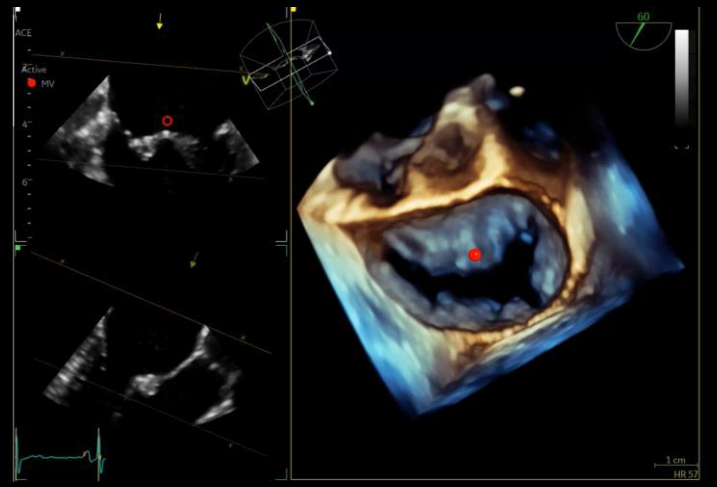
HD Color

HD Color is a 4D color flow rendering technique for volumetric flow perception and semi-transparent visualization of origin and size of high velocity jets



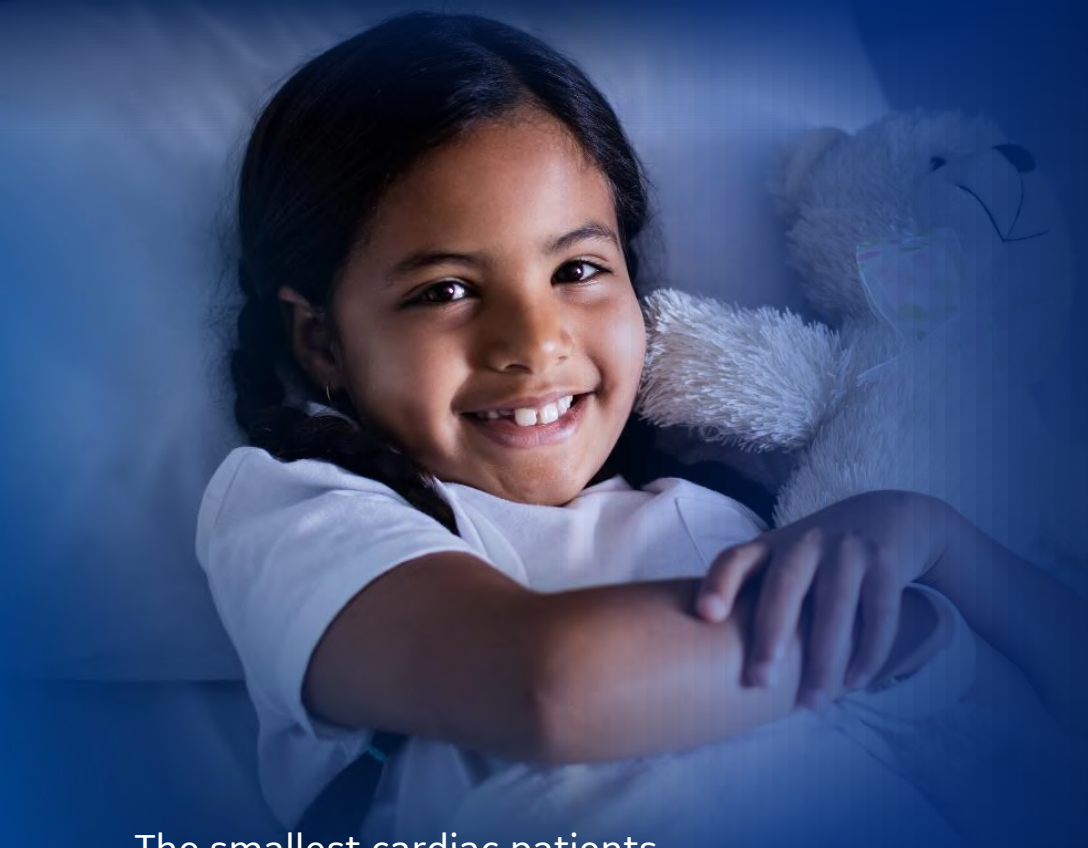
4D Markers

Make annotations that are viewable from all angles on 4D ultrasound volume data sets an their 2D views, facilitating communication in the echo lab, cath lab and OR..



CLINICAL EXCELLENCE
for Pediatrics

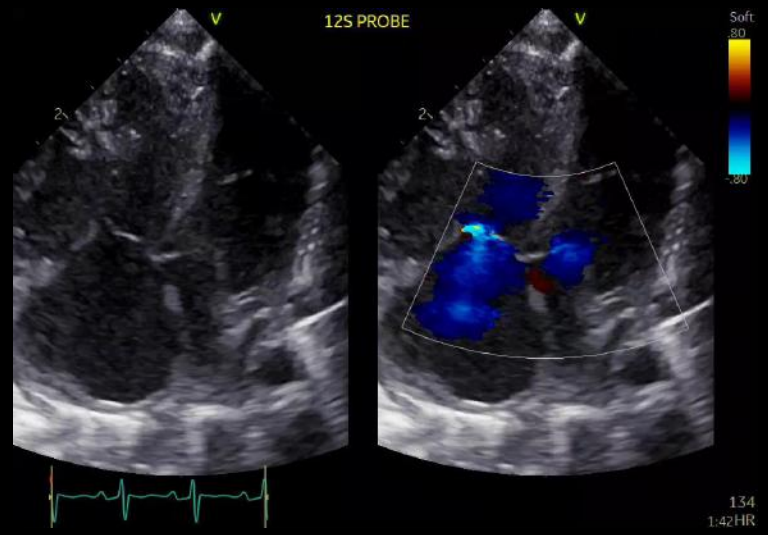
Vivid S70N
Ultra Edition



The smallest cardiac patients
can pose the biggest care challenges with
difficult to diagnose, severe conditions.

Pediatric imaging

Visualize small anatomies with speed, clarity and confidence thanks to Vivid S70N Ultra Edition's superb high-resolution imaging and dedicated pediatric probes.



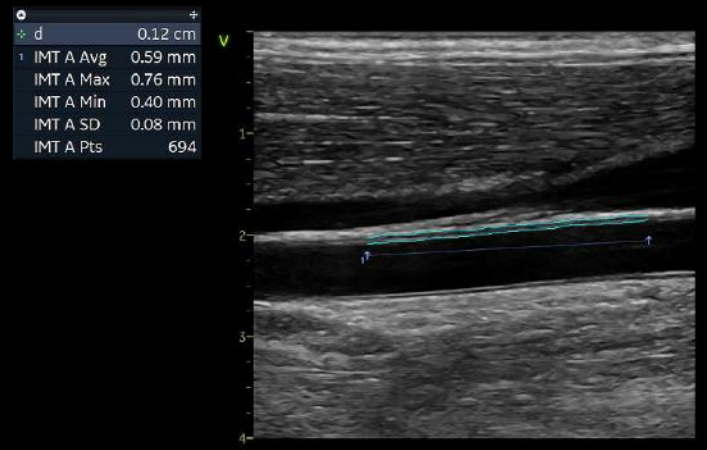
CLINICAL EXCELLENCE
beyond Cardiology

Vivid S70N
Ultra Edition

The demand for multi-purpose, cost efficient ultrasound systems with uncompromised image quality is growing. Your Vivid S70N Ultra Edition will exceed your expectations across a wide range of application.

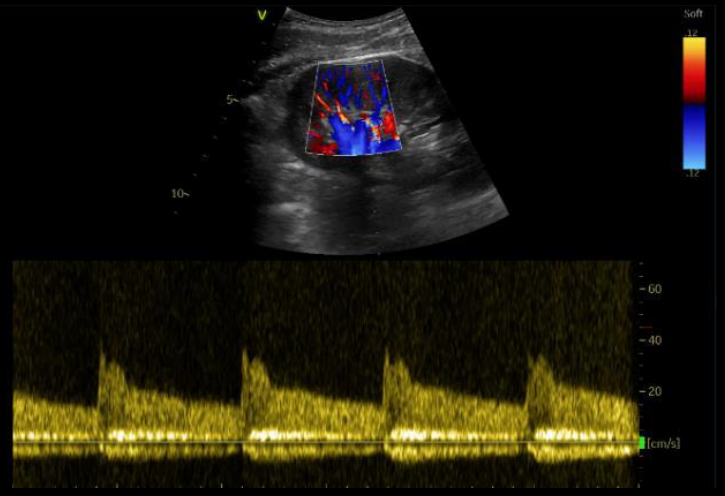
Vascular quantification

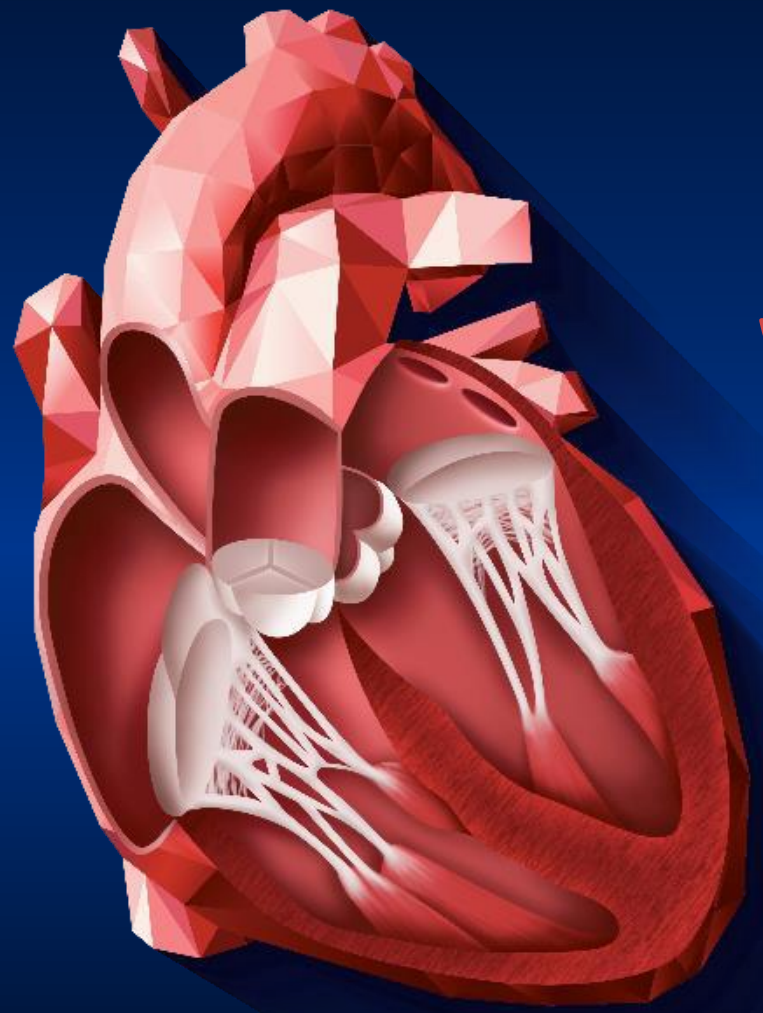
Develop fast and complete quantitative assessment of vascular anatomies, such as the Intima Media Thickness, with dedicated vascular measurement tools.



Abdomen diagnosis

Visualize tissues and flow patterns with greater details thanks to Vivid S70N Ultra Edition's high-resolution imaging.





VIVID HEART APPLICATIONS

A wide range of clinical applications for use in Core Echo Lab, Interventional and Pediatrics.

VIVID HEART APPLICATIONS

VISUALIZATION AND NAVIGATION

- 4D Markers
- FlexiSlice
- FlexiViews
- View-X

Ultra Edition

- HD Color

FLOW QUANTIFICATION

Ultra Edition

- Cardiac Auto Doppler AI
- AI Auto Measure Spectrum Recognition AI

VALVE AND CHAMBERS QUANTIFICATION

- 4D Auto AVQ
- 4D Auto MVQ
- 4D Auto LVQ

Ultra Edition

- AI Auto Measure 2D AI
- Auto EF AI

AFI FUNCTIONAL IMAGING

Ultra Edition

- AFI LV with AI View Recognition AI
- AFI RV
- AFI LA

APPLICATIONS POWERED BY AI

VIVID HEART
APPLICATIONS

NAVIGATION AND VISUALIZATION

Why guess? When you can see.

HD Color

4D color flow rendering technique for semi-transparent visualization of origin and size of high velocity jets

Benefits:

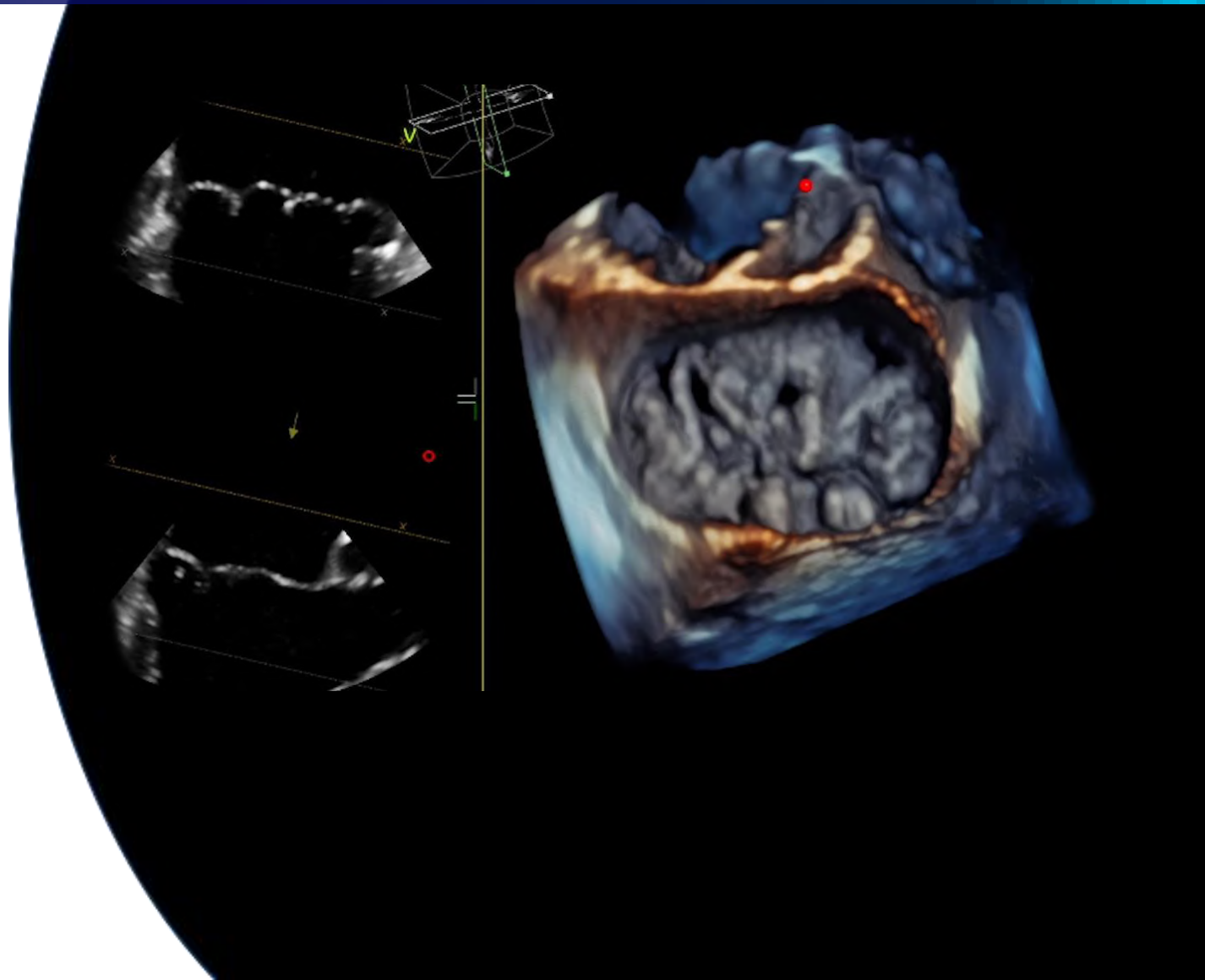
- Enhance spatial relationships between flow and the surrounding structures
- Surpress non-diagnostic low flow information. Work seamlessly with other visualization techniques such as 4D markers
- Supports 4D color flow data also from previous releases

NAVIGATION AND VISUALIZATION

4D Markers

Vivid S70N
Ultra Edition

Make annotations that are viewable from all angles on 4D ultrasound volume data sets and their 2D views, facilitating communication in the echo lab, cath lab and OR.

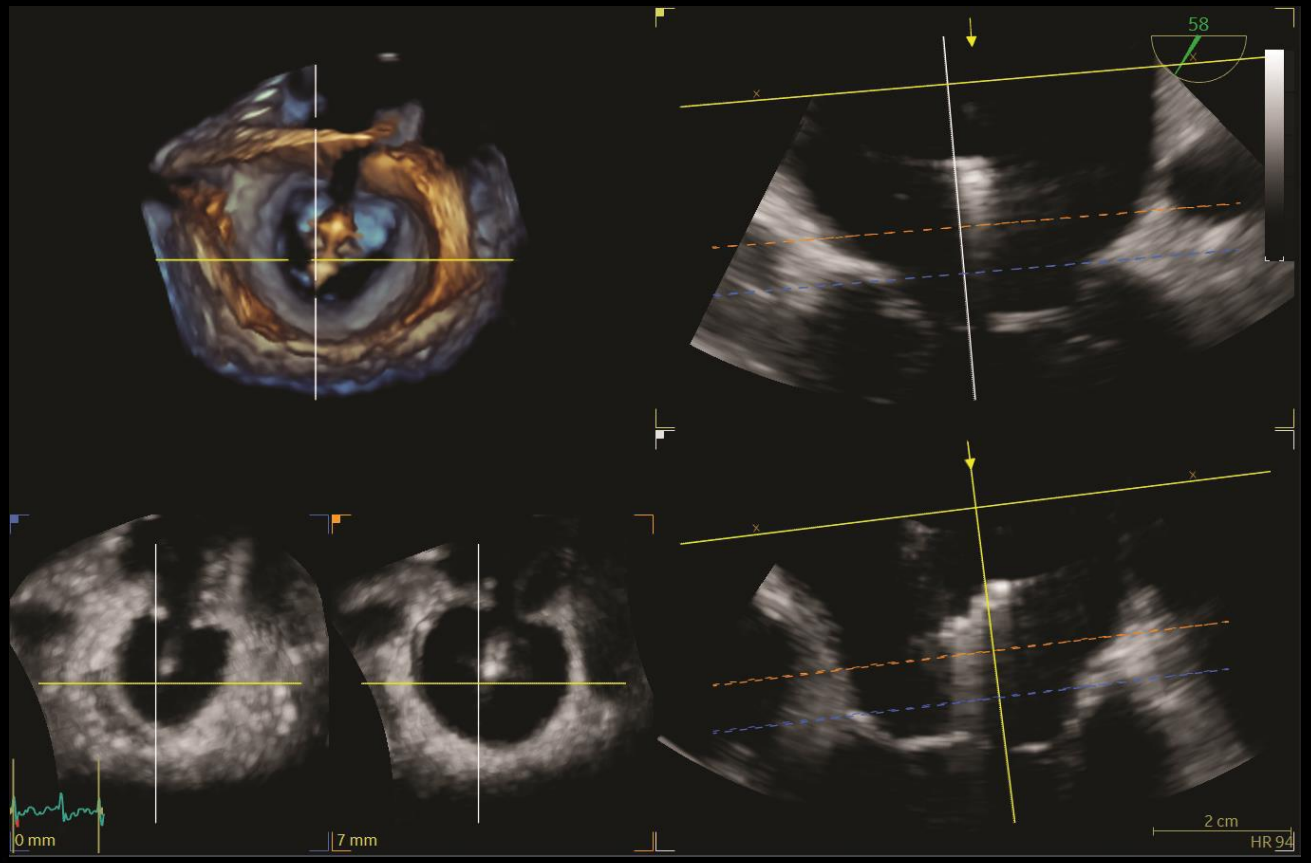


NAVIGATION AND VISUALIZATION

FlexiSlice

Vivid S70N
Ultra Edition

With a distance gauge and two viewing layouts, this interactive tool for obtaining 2D or render views in live or replay mode may provide enhanced insight as well as save time.

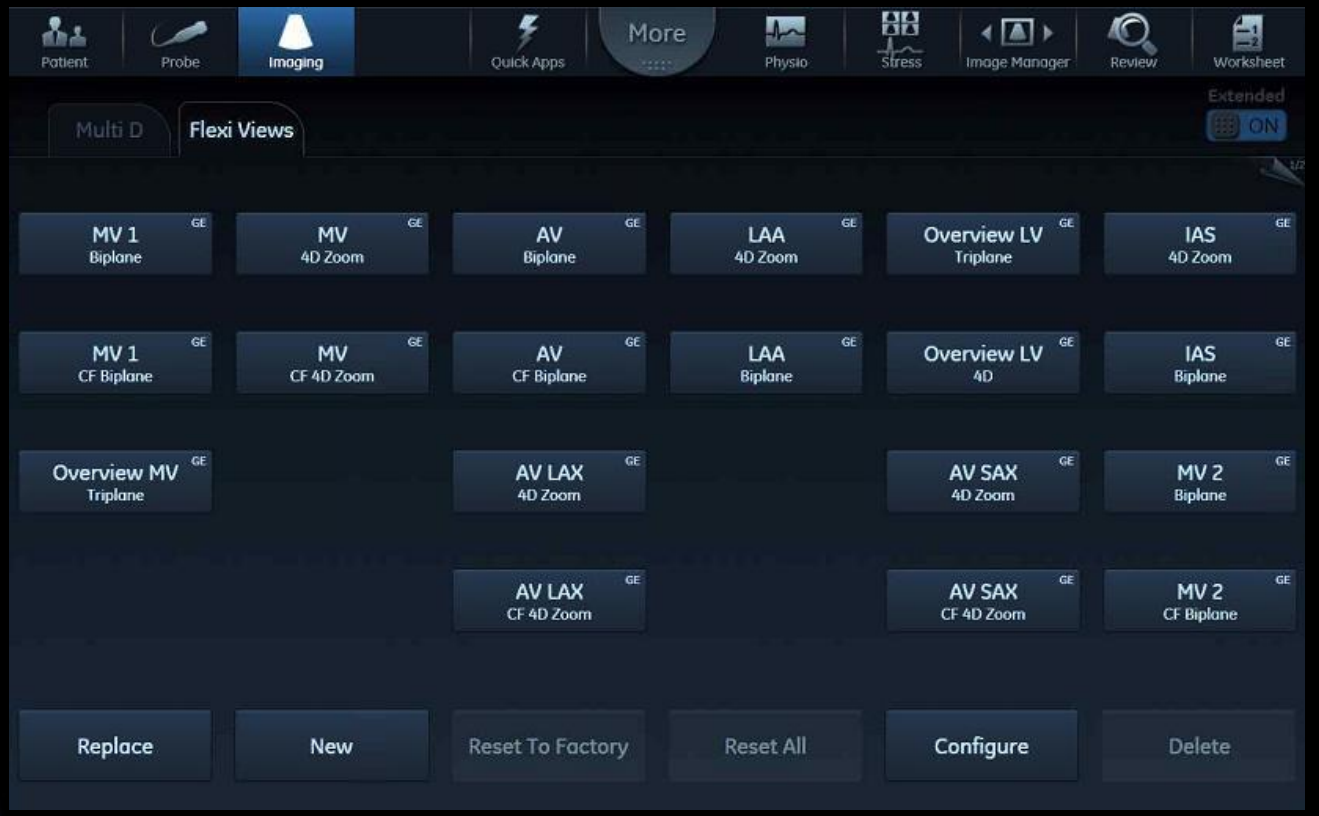


NAVIGATION AND VISUALIZATION

FlexiViews

Vivid S70N
Ultra Edition

Gain quick access to predefined 4D/multiplane views during live mode, potentially reducing scan time during complex interventional procedures.

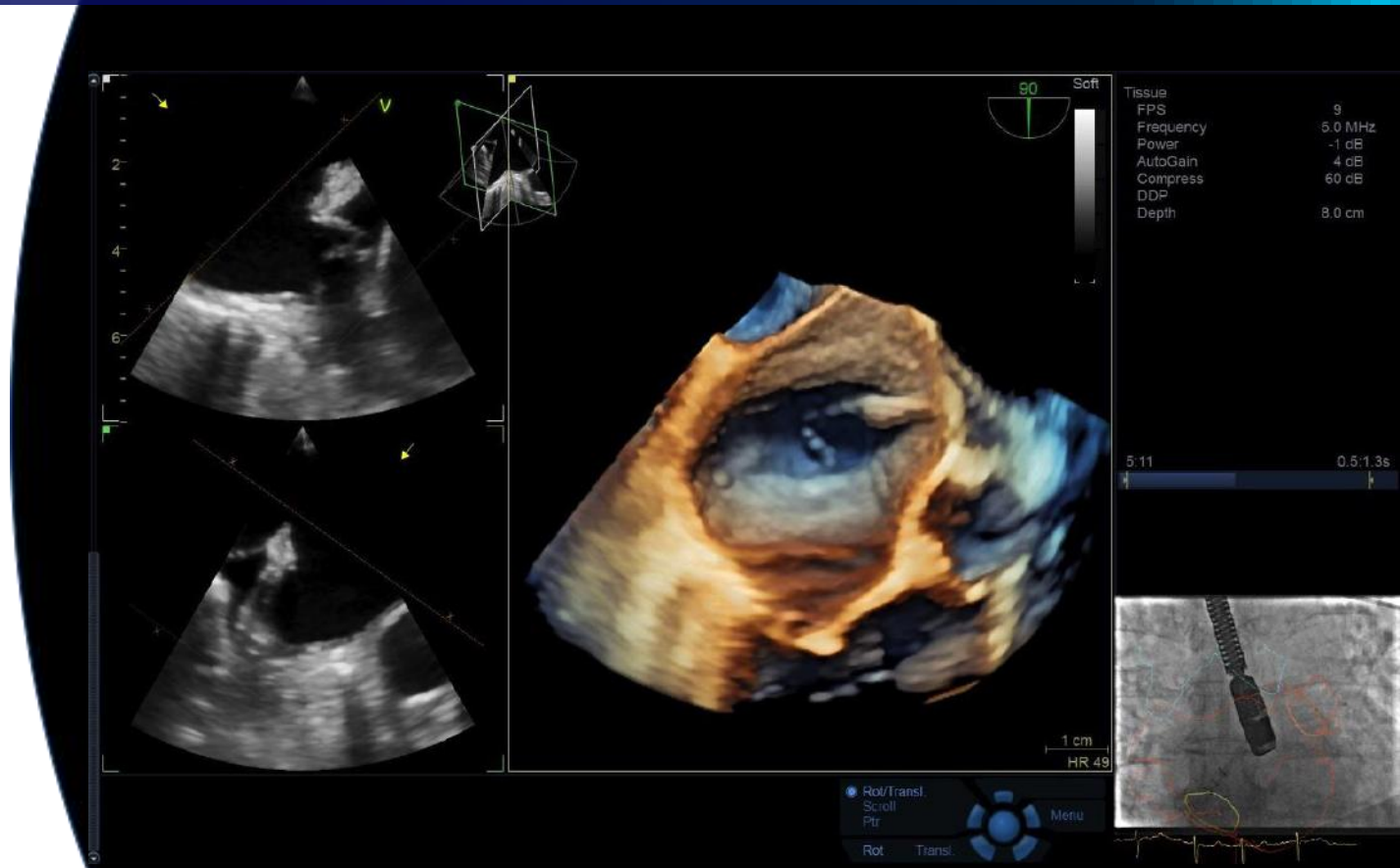


NAVIGATION AND VISUALIZATION

View-X

Vivid S70N
Ultra Edition

See X-ray from fluoroscopy in real time right on your Vivid S70N Ultra Edition screen as a picture in picture, facilitating communication between team members.



VIVID HEART
APPLICATIONS

FLOW QUANTIFICATION

Your time is precious. Save it.

Ultra Edition

FLOW QUANTIFICATION

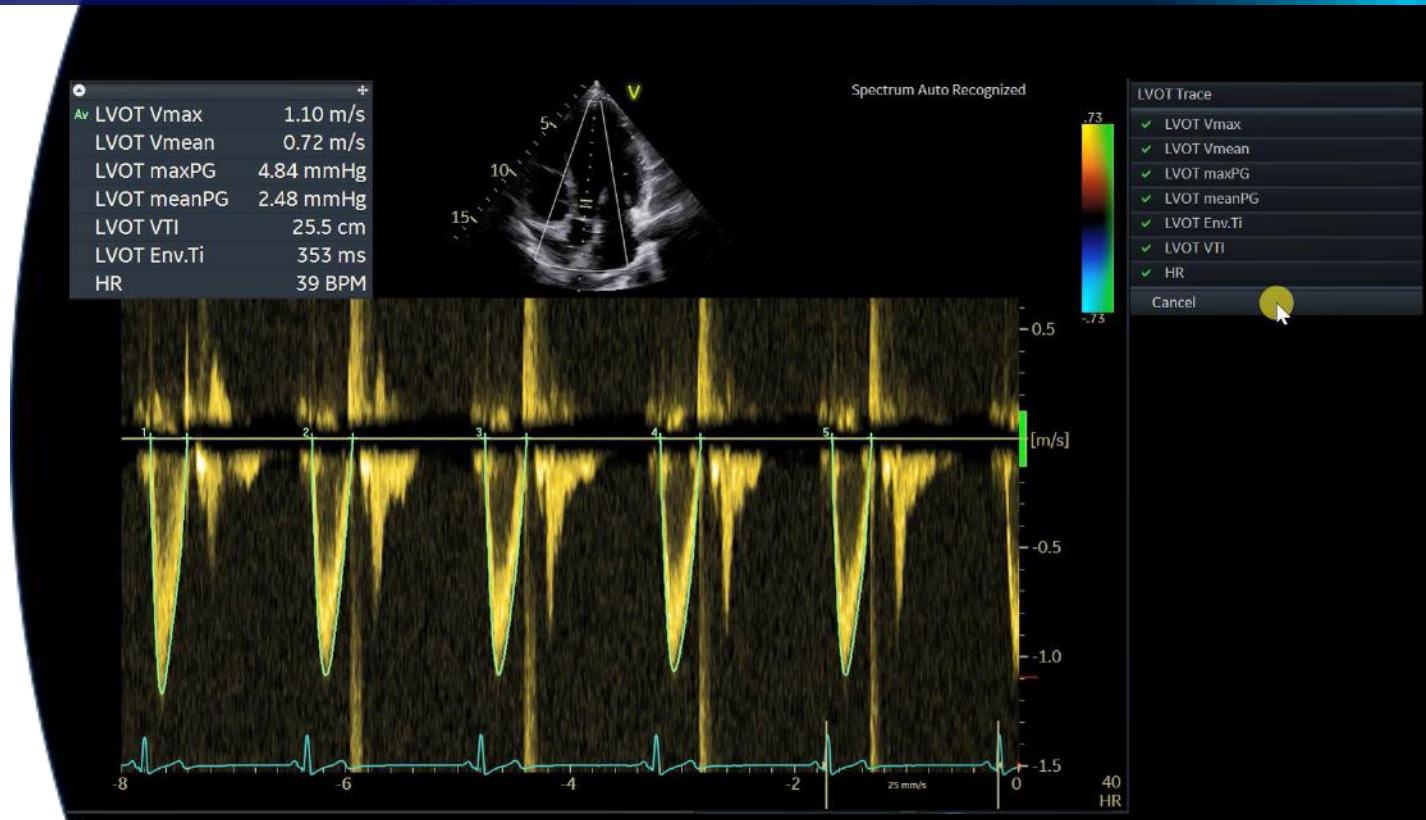
AI Auto Measure Spectrum Recognition

Vivid S70N
Ultra Edition

Semi-automatic selection of appropriate spectral Doppler measurement tool.

Benefits:

- Enables fewer manual interactions by automatically opening the appropriate measurement tool [1]
- Works seamlessly with Cardiac Auto Doppler
- Enhances reproducibility of follow-up studies when used in automated mode [1]
- Supports less experienced users with advanced automation



1. The Role of AI in Streamlining Echocardiography Quantification White Paper, Kristin McLeod - JB80498XX

APPLICATIONS POWERED BY AI

FLOW QUANTIFICATION

AI Cardiac Auto Doppler

Vivid S70N
Ultra Edition

Semi-automatic Cardiac Doppler measurements.

Benefits:

- Enhances reproducibility of follow-up studies when used in automated mode [1]
- Offers Doppler measurement in multiple cardiac cycles as recommended by guidelines for irregular heart rhythms [2,3]
- Supports less experienced users with advanced automation

REDUCED TIME PER MEASUREMENT

UPTO 93%

Fewer Keystrokes [1]

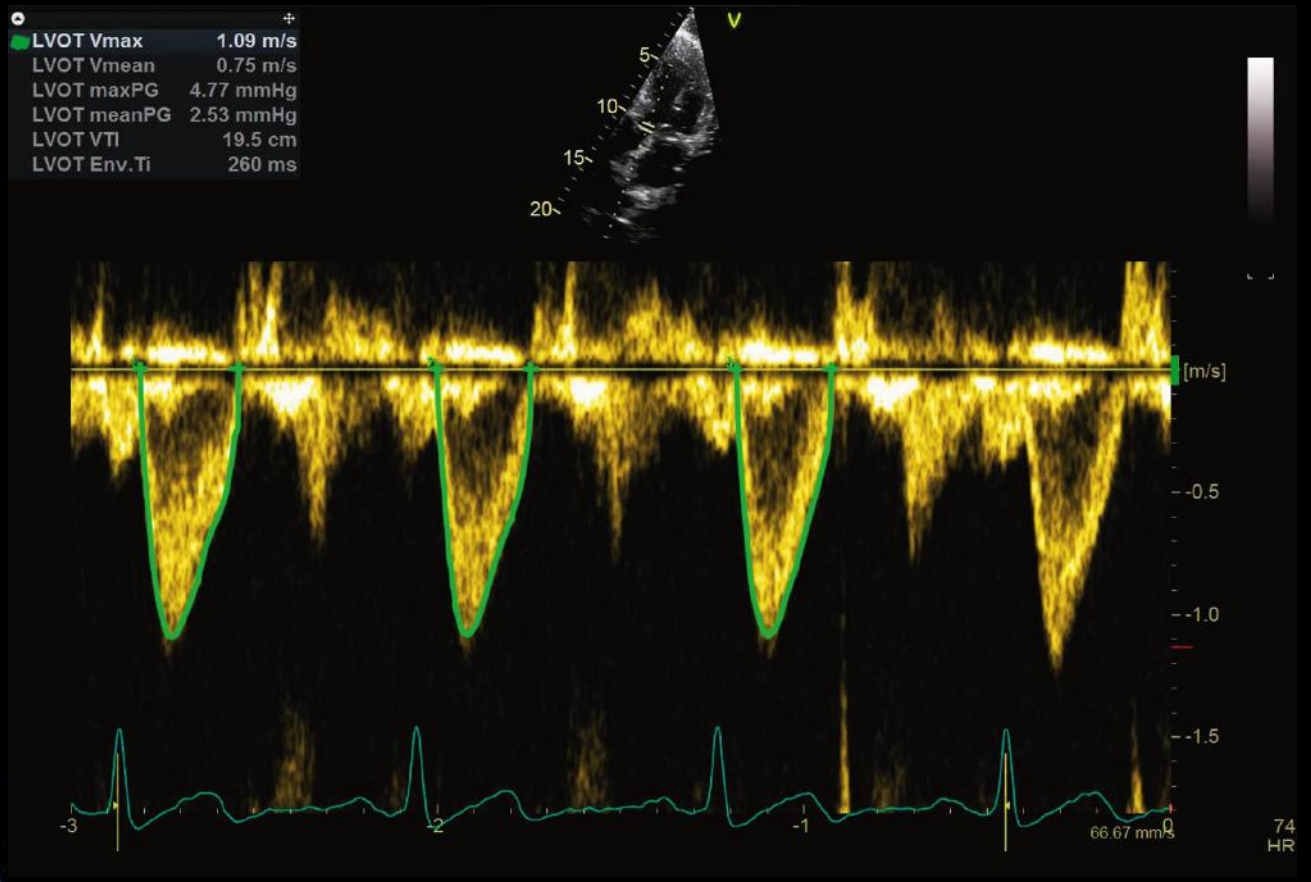
LOWER INTER OPERATOR VARIABILITY

REDUCE VARIABILITY ~3x

Standardized exams with greater reproducibility [1]

ACCELERATED WORKFLOW

Productivity improvement



1. Based on results of time and motion study conducted by GE "JB49055XX - Cardiac Auto Doppler"; study results indicated time savings related productivity increase up to ~8 on an annual basis for a facility per sonographer
2. European Association of Echocardiography recommendations for standardization of performance, digital storage and reporting of echocardiographic studies (Eur Journal of Echo 2008 – Evangelista, Badano, Monaghan, Zamorano, Lancellotti).
3. Recommendations for Quantification of Doppler Echocardiography: A Report From the Doppler Quantification Task Force of the Nomenclature and Standards Committee of the American Society of Echocardiography (JASE 2002)

APPLICATIONS POWERED BY AI

VIVID HEART
APPLICATIONS

VALVES AND CHAMBERS QUANTIFICATION

Precision at the heart of quantification.

Ultra Edition VALVES AND CHAMBERS QUANTIFICATION

AI Auto Measure 2D

Vivid S70N
Ultra Edition

Semi-automated LV dimension measurements (2D calipers) in the parasternal long axis view, reducing manual interactions.

Benefits:

- Achieves fast measurements of left ventricle dimensions:
  - Up to 80% less clicks [1]
  - No need to scroll to look for ED and ES frames
  - Reduce manual workflow during analysis of cardiac images
- Improves reliability and repeatability of measurements – potentially increasing reproducibility for follow-up studies

1. The Role of AI in Streamlining Echocardiography Quantification White Paper, Kristin McLeod - JB80498XX

APPLICATIONS POWERED BY AI

Ultra Edition VALVES AND CHAMBERS QUANTIFICATION

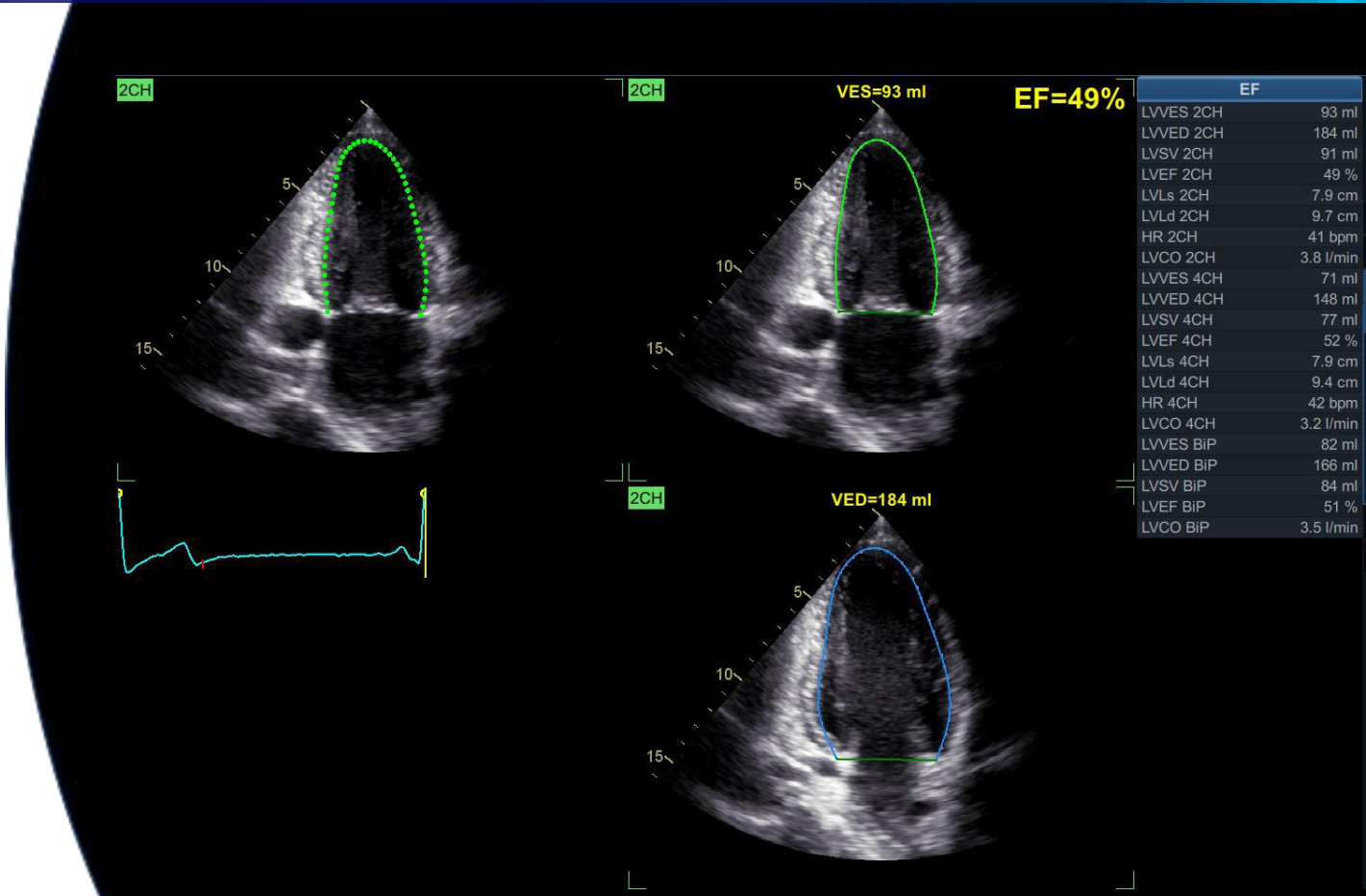
AI Auto EF

Vivid S70N
Ultra Edition

Powered by AI-based View Recognition, Auto EF provides semi-automated quantification of left ventricular volumes and ejection fraction. [1]

Benefits:

- Achieves fast measurements of ejection fraction
- DICOM support. Assessment of the left ventricle ejection fraction also on data sets acquired on other vendors' systems



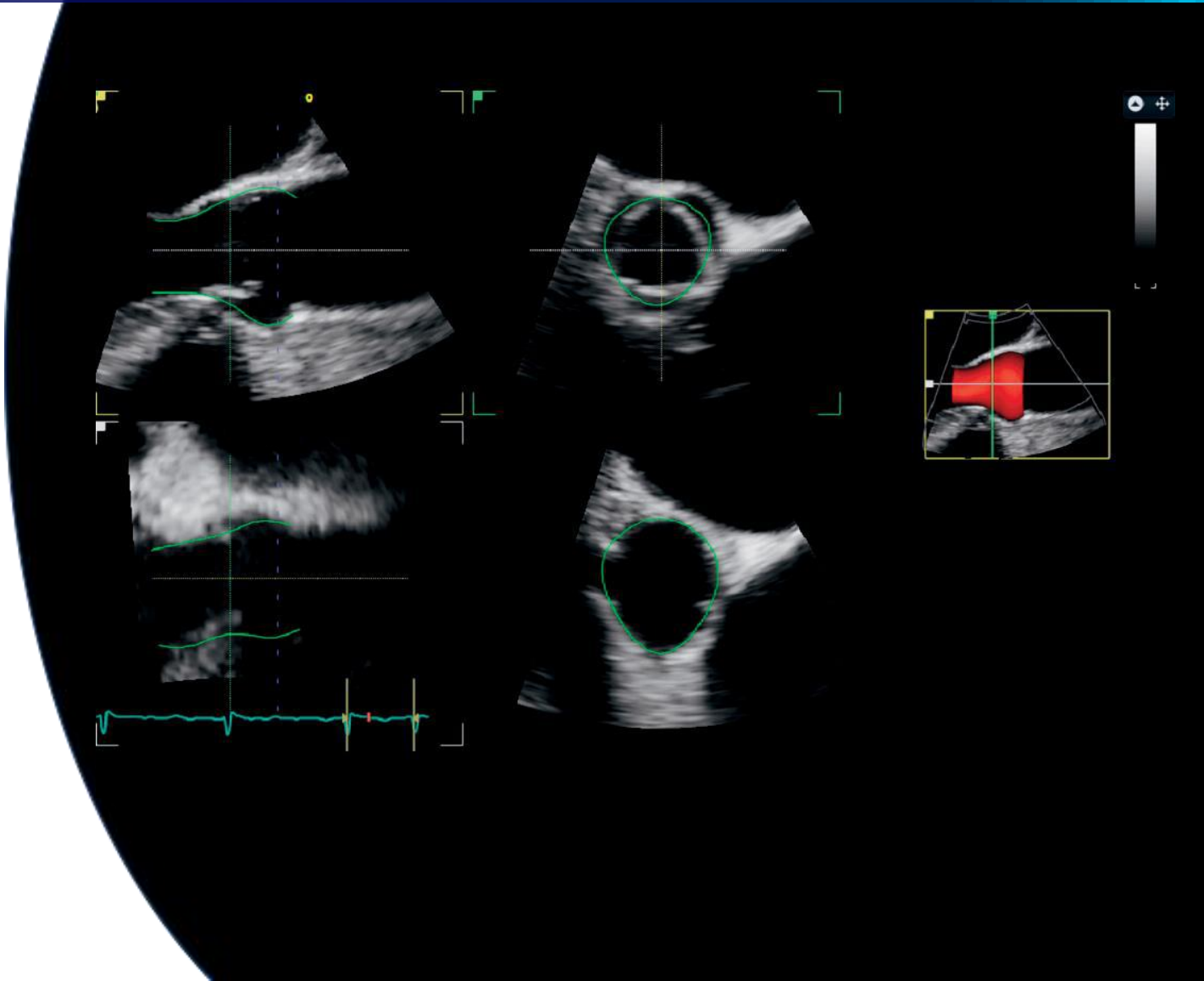
1. View Recognition is only applicable to images acquired with TTE probe on GE systems

VALVES AND CHAMBERS QUANTIFICATION

4D Auto AVQ

Vivid S70N
Ultra Edition

Automatically segment, align and quantify the aortic outflow tract – vital to device sizing and orientation for TAVI/TAVR procedures.

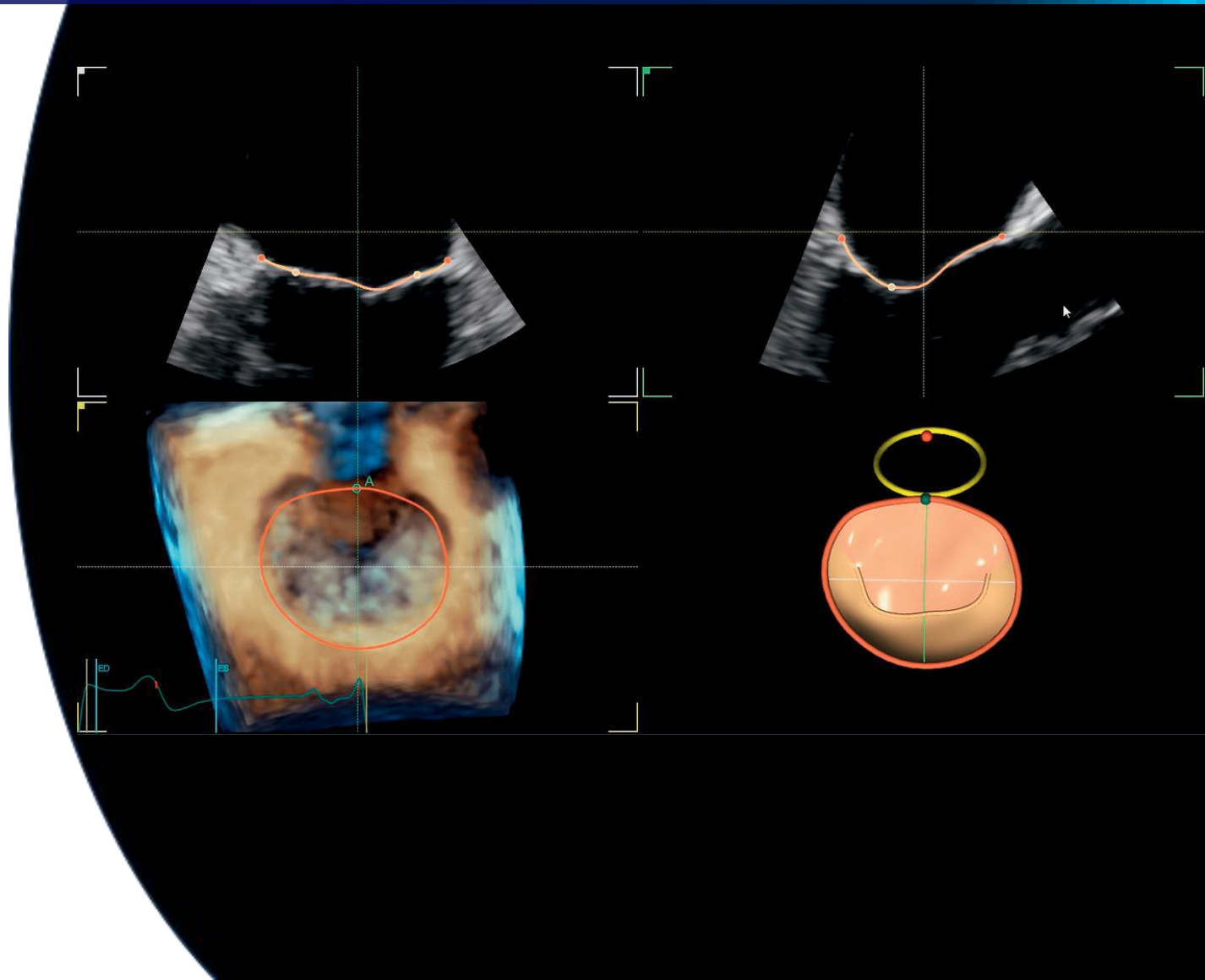


VALVES AND CHAMBERS QUANTIFICATION

4D Auto MVQ

Vivid S70N
Ultra Edition

Supporting TEE images, this integrated package helps visualize and quantify the mitral valve via a semi-automatic, surface-detecting algorithm.

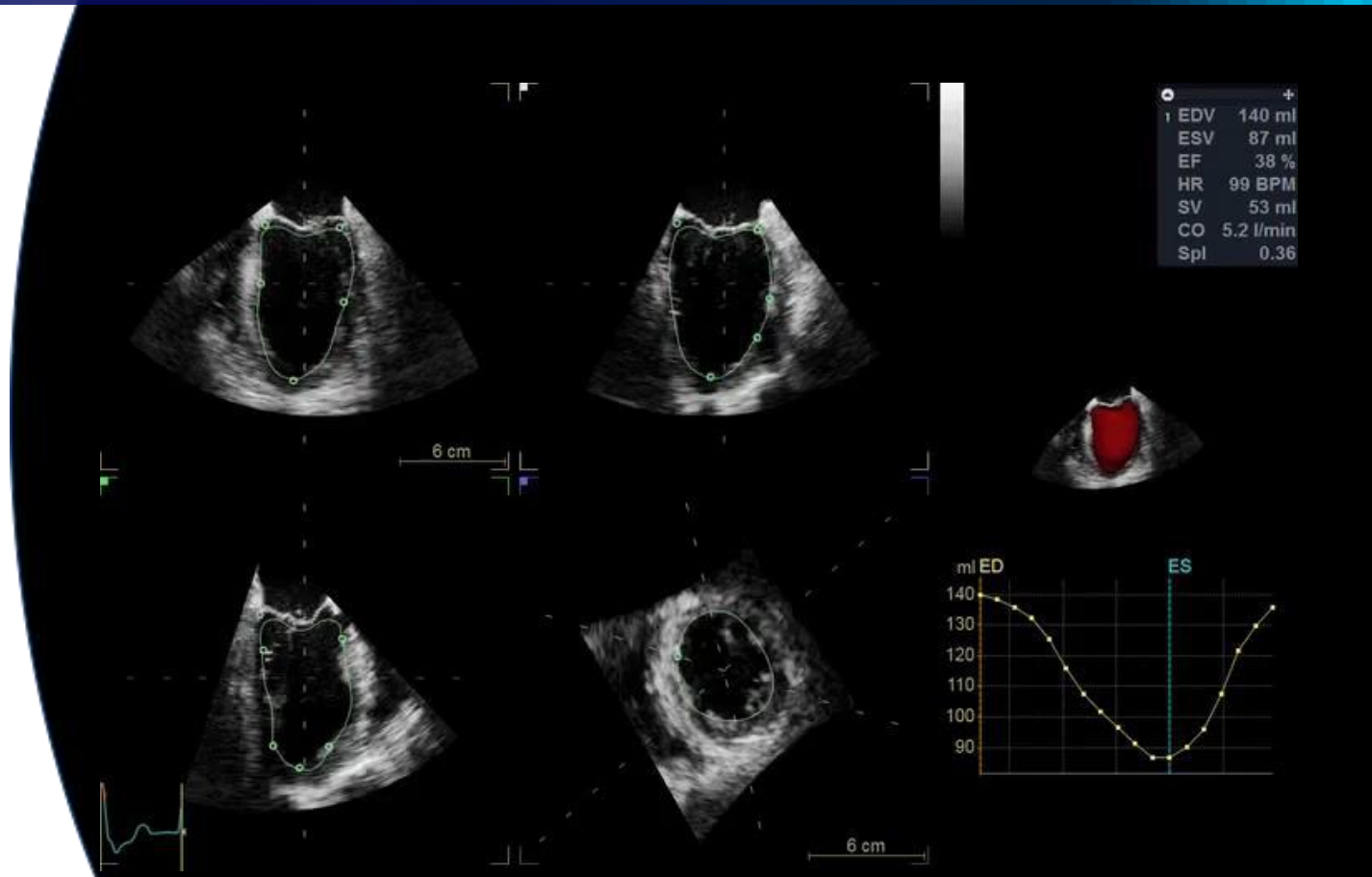


VALVES AND CHAMBERS QUANTIFICATION

4D Auto LVQ

Vivid S70N
Ultra Edition

Adapted to work with full volume data sets acquired with the 4D TEE transducer, 4D Auto LVQ for TEE brings you a fast and easy automated method for left ventricle quantification, including volumes and ejection fraction.



VIVID HEART
APPLICATIONS

AFI FUNCTIONAL IMAGING

From diagnosis to prognosis.

Ultra Edition AFI FUNCTIONAL IMAGING

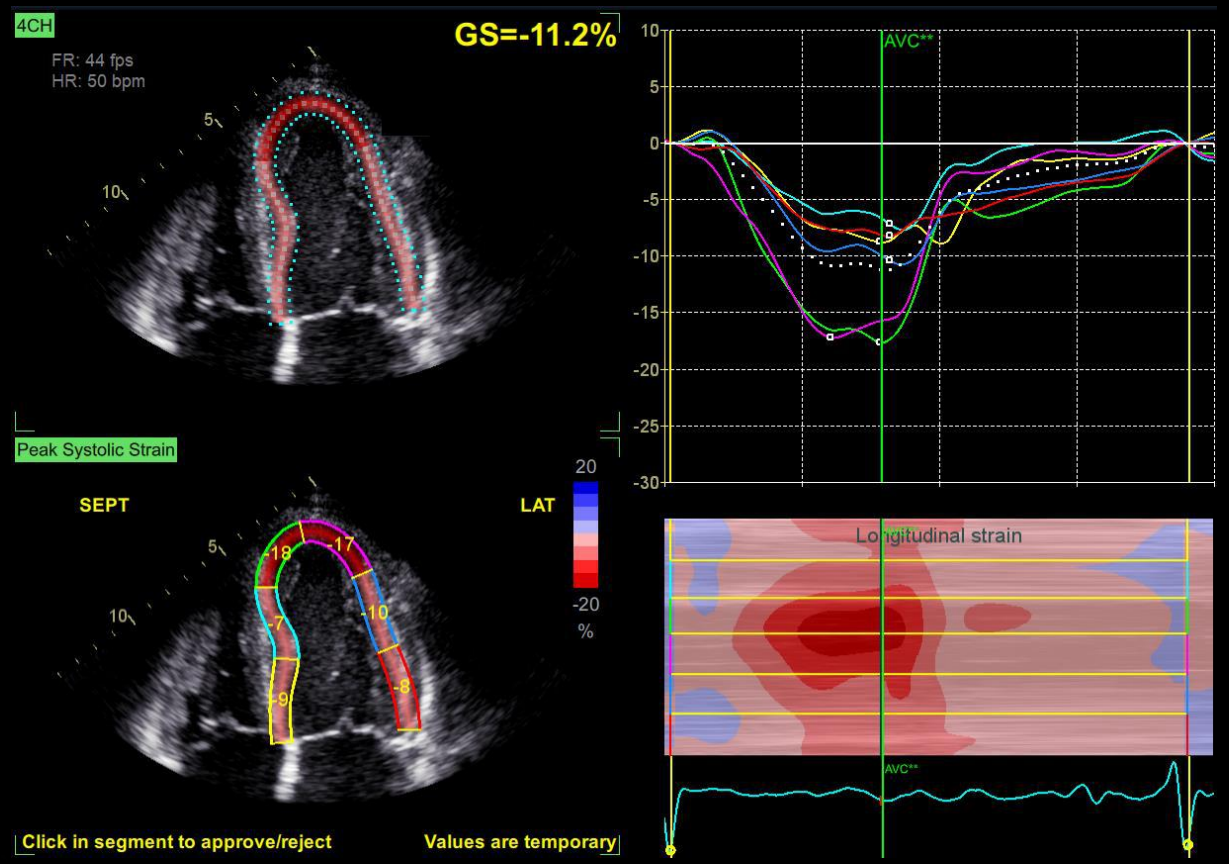
AI AFI LV with AI View Recognition*

Vivid S70N
Ultra Edition

Powered by AI-based View Recognition, AFI LV provides semi-automated quantification of left ventricular global and segmental strain.

Benefits:

- Offers advanced industry pioneered speckle tracking algorithm for quantifying myocardial deformation
- Works seamlessly - integrated ejection fraction calculation
- Supports Adult and Pediatric TTE and Adult TEE images
- Provides time savings via automatic selection of the appropriate
  4-chamber, 2-chamber and APLAX images for analysis
- DICOM support. Assessment of the left ventricle ejection fraction also on data sets acquired on other vendors' systems



*View Recognition is only applicable to images acquired with TTE probe on GE systems

APPLICATIONS POWERED BY AI

Ultra Edition

AFI FUNCTIONAL IMAGING

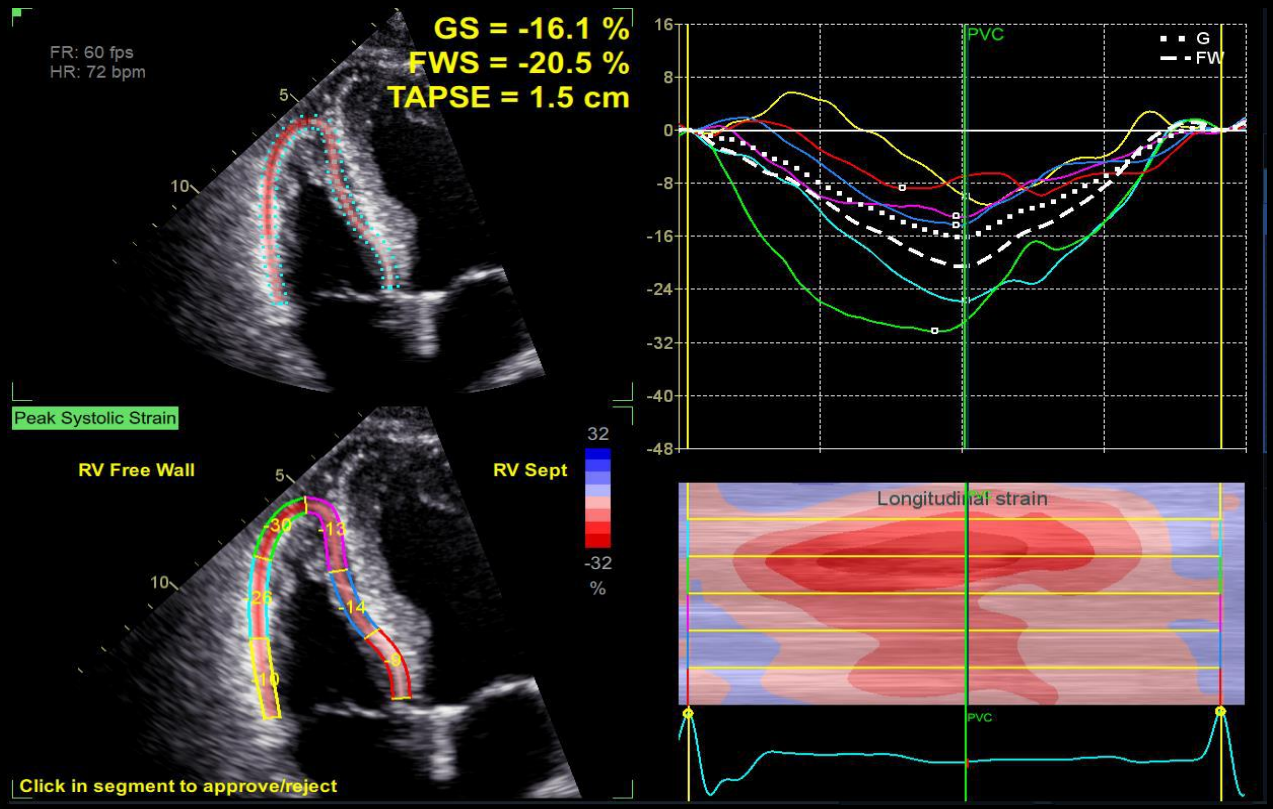
AFI RV

Vivid S70N
Ultra Edition

AFI RV is a novel tool to assess the right ventricular function by advanced speckle tracking echocardiography.

Benefits:

- Offers renown Vivid AFI user interface and workflow to allow current and new users easy adoption
- Supports right ventricle free wall strain, global strain and Tricuspid Annular Plane Systolic Excursion (TAPSE)
- Follows the 2018 EACVI-ASE Strain Standardized Task Force guidelines [1]
- Supports right ventricle images also from previous releases



1. Standardization of left atrial, right ventricular, and right atrial deformation imaging using two-dimensional speckle tracking echocardiography: a consensus document of the EACVI/ASE/Industry Task Force to standardize deformation imaging. Badano et al. European Heart Journal - Cardiovascular Imaging (2018) 0, 1–10 doi:10.1093/ehjci/jey042

APPLICATIONS POWERED BY AI

Ultra Edition

AFI FUNCTIONAL IMAGING

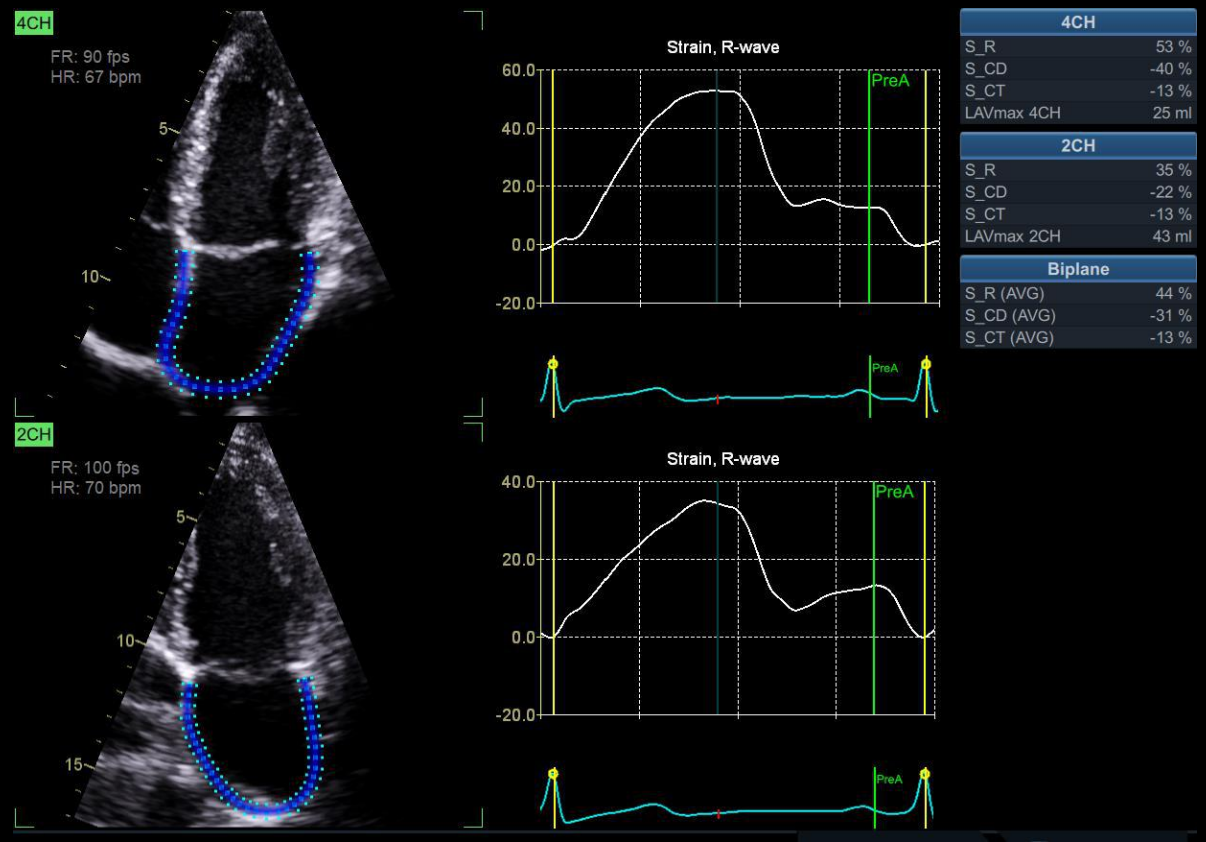
AFI LA

Vivid S70N
Ultra Edition

AFI LA Strain is a novel method to assess the left atrial function allowing global strain to be measured using speckle tracking echocardiography.

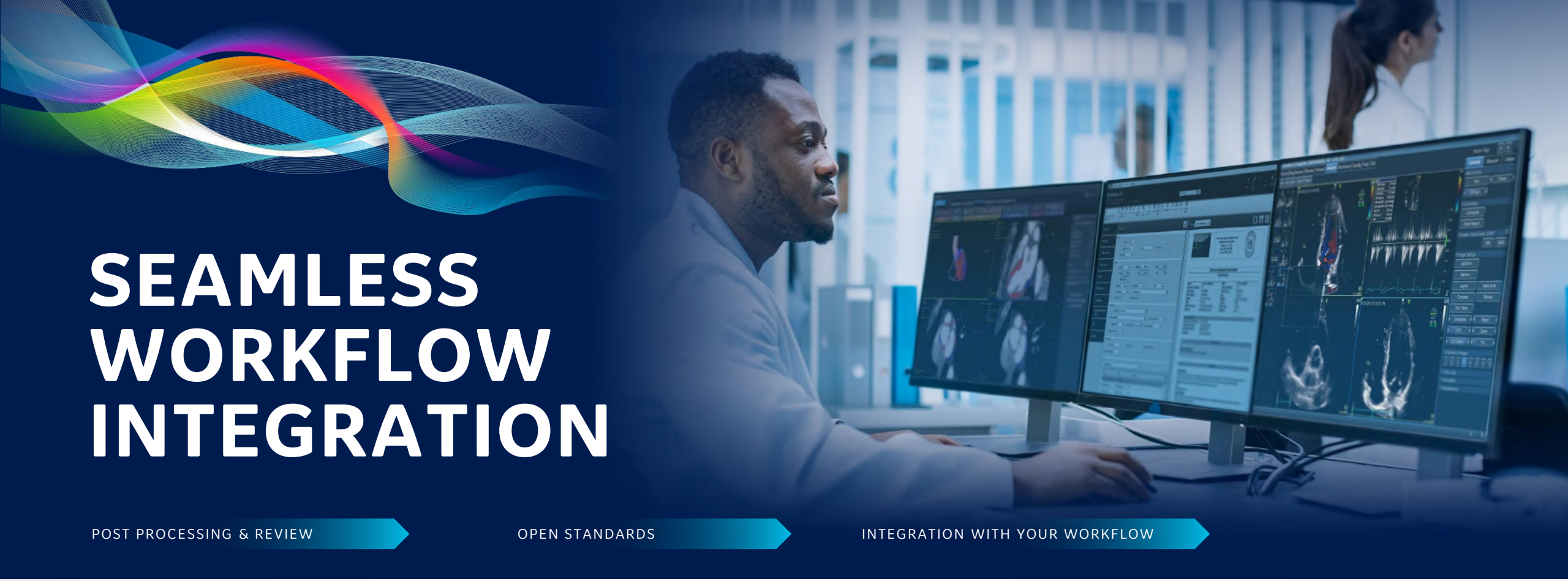
Benefits:

- Offers Vivid renown AFI user interface and workflow allowing users to easily adopt
- Supports left atrium strain, volumes and emptying fraction measurements
- Follows the 2018 EACVI-ASE Strain Standardized Task Force guidelines [1]
- Supports left atrium images also from previous releases



1. Standardization of left atrial, right ventricular, and right atrial deformation imaging using two-dimensional speckle tracking echocardiography: a consensus document of the EACVI/ASE/Industry Task Force to standardize deformation imaging. Badano et al. European Heart Journal - Cardiovascular Imaging (2018) 0, 1–10 doi:10.1093/ehjci/jey042

APPLICATIONS POWERED BY AI



SEAMLESS WORKFLOW INTEGRATION

POST PROCESSING & REVIEW

OPEN STANDARDS

INTEGRATION WITH YOUR WORKFLOW

EchoPAC Software Only and EchoPAC Plug-in:

- Analyze and review data from GE Healthcare Vivid family of scanners, as well as DICOM images form other ultrasound systems.
- Access all Vivid measurement and review tools utilizing GE Healthcare Raw Data or industry standard DICOM data
- DICOM Image transfer with optional GE Healthcare Raw Data transfers images easily in your existing workflow
- DICOM SR Measurement Transfer including standard and custom measurement allows seamless integration with GE Healthcare and other industry reporting systems and EMRs [3]

EchoPAC Plug-in is available for:

- GE Healthcare Centricity™ Cardio Enterprise with Intelligent Reporting (IR).
- GE Healthcare ViewPoint™ 6 with EchoPAC Suite [2]
- As a plug-in to third party PACS

With Centricity Cardio Enterprise IR, routine adult echo reports are

83% **complete before the physician opens the exam to review.** [1]

1. Centricity Cardio Workflow v7 Intelligent Reporting out-of-the-box configuration compared to 2017 IAC guidelines excluding doppler. CCW Intellgent Reporting Outcome - JB74831XX
2. EchoPAC Suite is a marketing name for EchoPAC Plug-in
3. With the DICOM SR support, Measures & Analysis (M&A) for an exam can be sent at the end of the exam or when exported from local archive. The destination can be either a server on the network (Storage SCP) or a removable media (DICOM Media) depending on the DICOM dataflow selected. Custom measurements supported only for Adult Echo (TID5200) and Pediatric Heart (TID5220).

SonoDefense

ADVANCED CYBERSECURITY AND DATA PRIVACY PROTECTION

Protecting against these threats and safeguarding your patients and your institution requires more than anti-virus protection. SonoDefense is GE Healthcare's multi-layer strategic approach to cybersecurity and patient data privacy for ultrasound.

SonoDefense is designed to:

- Keep the ultrasound machine safe and functional in the face of cyberthreats
- Protect patient data on the machine from unauthorized access
- Enable you to successfully implement patient data and security policies, while still managing product daily workflows

[POP]

PERFORMANCE
OPTIMIZATION
PARTNERSHIPS

WHERE DO YOU NEED HELP ?

I need **education and training support** to achieve clinical and operational excellence

I want to maximize device **performance and utilization to achieve more** with my assets

I don't want to deal with **unplanned downtime** and maximize **device availability**

I want a shared risk partnership to **optimize maintenance costs** based on mutual expertise

I want to protect against **cyber vulnerability** and ensure that **my device is up to date**

I need a holistic ecosystem of solutions for **probe fleet management**

[POP]
PERFORMANCE
OPTIMIZATION
PARTNERSHIPS

STAFF EXCELLENCE

A comprehensive portfolio of training for clinical and technical users.

Helping you and your team build customized development plans to foster excellence and increased confidence.

EDUCATIONAL PROGRAMS

Tailored training content for all users' needs

VIVID CLUB

Exclusive community for clinical and technical users

DIGITAL EXPERT[1]

Hands-on learning, personalized experience

STAR SUPPORT APPLICATION

Application support powered by augmented reality

1. Digital Expert is only offered in the USA

[POP]
PERFORMANCE
OPTIMIZATION
PARTNERSHIPS

PROACTIVE MANAGEMENT

Use digital technology and tools to minimize expensive and disruptive unplanned downtime.

Proactive monitoring to reduce cost and revenue loss from unplanned failures and automated updates for peace of mind.

PROACTIVE MAINTENANCE

Know the failure before it occurs

REMOTE SERVICES & REAL-TIME SUPPORT

On demand support to minimize disruptions

AUTOMATED, REMOTE SW UPDATE

Proactive OS and performance enhancements updates

[POP]
PERFORMANCE
OPTIMIZATION
PARTNERSHIPS

DEVICE PROTECTION

Keep your device state-of-the-art with software upgrades, new applications and security patches

Optimizing your device to drive clinical and operational benefits and help you stay ahead of the game, without changing your equipment.

OPTIONS & UPGRADES OFFERS

Technological obsolescence protection program

SONODEFENSE

Advanced cybersecurity and data privacy protection

CONTINUITY SUPPORT PLUS

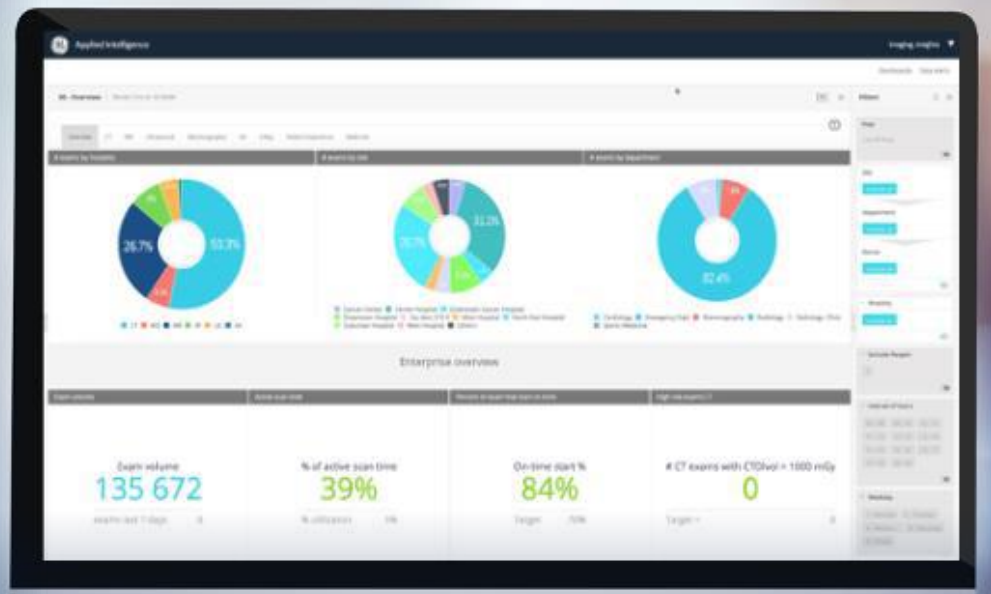
Proactive updates to keep your devices current and secure

[POP]
PERFORMANCE
OPTIMIZATION
PARTNERSHIPS

ASSET OPTIMIZATION

Customizable dashboards for asset utilization and consulting services to provide actionable insights.

Achieving more with your assets to improve patient care and realize department strategic plans.



ULTRASOUND EXCELLENCE

Cloud-based solution for powerful, intuitive dashboards to deliver key outcomes

iCENTER

On-site solution for powerful, intuitive dashboards to deliver key outcomes

[POP]
PERFORMANCE
OPTIMIZATION
PARTNERSHIPS

IMPROVED UPTIME

Best-in-class repair services to drive uptime.
Fully scalable from full coverage to shared maintenance.

Thoroughly aligned with your own in-house capabilities, providing the right balance between staff autonomy and our expertise.

MAINTENANCE CONTRACT

Smart Diagnostics by trained engineers - GE or inhouse

eCOMMERCE (SERVICE SHOP)

A complete platform for all your biomed needs

iCENTER / UPDATEME

On-site solution for powerful, intuitive dashboards to deliver key outcomes

REPAIRS CENTERS & LOANERS

A global network for depots to meet multivendor repair needs

[POP]
PERFORMANCE
OPTIMIZATION
PARTNERSHIPS

PROBE PERFORMANCE

Customizable portfolio of solutions for probe lifecycle needs to improve availability and performance.

Proactive probe care to help you increase diagnostic quality, decrease cross-contamination risk and expand the life span of the transducers

PROBE CARE APPLICATION

Access to education and probe evaluation at your fingertips

PROBE CARE TRAINING

Comprehensive content for probe care and handling

REPAIRS CENTERS & LOANERS

A global network for depots to meet multivendor repair needs

DESINFECTION SOLUTIONS

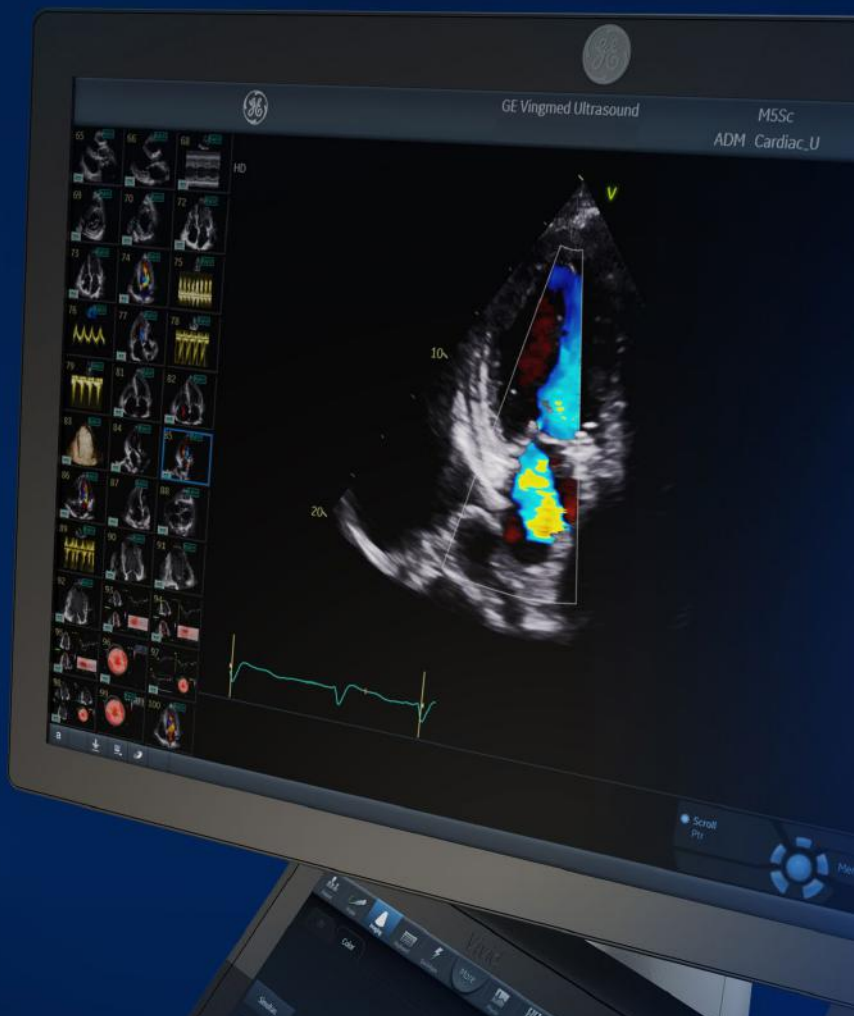
A complete solution to help you stay compliant with high standard of probe care

JB80428XX

Vivid™ S70N
Ultra Edition

Cardiovascular Ultrasound
Probe guide

Vivid S70N Ultra Edition offers a broad range of probes to help achieve extraordinary images for cardiac, vascular, abdominal, pediatric, neonatal head, fetal heart, obstetric, gynecologic, urological, adult transcranial and small parts applications.



Vivid

gehealthcare.com/vivid

	Applications	Description	Footprint	Biopsy Guide	Bandwidth	Field of View	Depth of Field
	Sector						
 M5Sc-D	Cardiac, Pediatric, Abdominal, Fetal Heart, Adult Transcranial, Coronary, Stress, LVO Stress,† LVO Contrast,† OB/GYN, Vascular	XDclear™ Active Matrix Single Crystal Phased Array Transducer	18 x 27 mm	Multi-angle disposable with a reusable bracket	1.5 - 4.6 MHz	120°	36 cm
 6S-D	Pediatric, Cardiac, Coronary, Neonatal Head, Abdominal, Fetal Heart	Phased Array Transducer	17 x 24 mm		2.4 - 8.0 MHz	115°	16 cm
 12S-D	Pediatric, Cardiac, Coronary, Neonatal Head, Abdomen, Vascular	Phased Array Transducer	13 x 18 mm		3.0 - 12.0 MHz	105°	12 cm
	Linear						
 9L-D	Peripheral Vascular, Abdomen, Contrast† (optional), Musculoskeletal, Thyroid, Small Parts, Nerves, Pediatrics	Linear Array Transducer	14 x 53 mm	Multi-angle disposable with a reusable bracket	2.4 - 10.0 MHz	45 mm	16 cm
 11L-D	Peripheral Vascular, Small Parts, Breast, Thyroid, Musculoskeletal, Nerves	Linear Array Transducer	13 x 47 mm	Multi-angle disposable with a reusable bracket	4.0 - 12.0 MHz	39 mm	8 cm
 ML6-15-D	Peripheral Vascular, Small Parts, Breast, Thyroid, Muscoloskeletal	Matrix Linear Arrey Transducer	16 x 61 mm	Multi-angle disposable with a reusable bracket	4.5 - 15.0 MHz	50 mm	8 cm
	Intraoperative						
 L8-18i-D	Musculoskeletal, Vascular, Small Parts	Intraoperative Linear Array Transducer	11 x 35 mm		5.0 - 18.0 MHz	25 mm	10 cm

† GE Healthcare's Vivid Ultra Edition S70N is designed for compatibility with commercially available contrast agents. Because the availability of these agents is subject to government regulation and approval, product features intended for use with these agents may not be commercially marketed nor made available before the contrast agent is approved for use. Advanced contrast features are only enabled on systems for delivery in countries or regions where the agents are approved for use or for investigational or research use.

	Applications	Description	Footprint	Biopsy Guide	Bandwidth	Field of View	Depth of Field
	Convex						
 C1-5-D	Abdomen, OB/GYN, Urology, Vascular, Fetal Heart, Contrast† (optional)	Curved Array Transducer	17 x 69 mm	Multi-angle disposable with a reusable bracket	1.4 - 6.0 MHz	70°	50 cm
 C1-6-D	Abdomen, Contrast† (optional), OB/GYN, Urology, Vascular, Fetal Heart	XDclear Single Crystal Curved Array Transducer	16 x 70 mm	Multi-angle disposable with a reusable bracket	1.4 - 6.0 MHz	70°	50 cm
 C2-9-D	Abdomen, OB/GYN, Urology, Fetal Heart	XDclear Single Crystal Curved Array Transducer	14 x 51 mm	Multi-angle disposable, with a reusable bracket	2.3 - 8.4 MHz	65°	30 cm
 C3-10-D	Neonatal Head, Vascular, Abdomen, Musculoskeletal, Nerves	XDclear Single Crystal Tightly Curved Array Transducer	12 x 22 mm		3.0 - 10.0 MHz	95°	14 cm
 iC5-9-D	OB/GYN, Urology, Fetal Heart	Tightly Curved Array Transducer	17 x 21 mm	Single-angle disposable bracket	3.3 - 8.6 MHz	128°	30 cm
	Doppler						
 P2D	Cardiac	Pencil Transducer	16 mm diameter		2.0 MHz		
 P6D	Vascular	Pencil Transducer	8 mm diameter		6.3 MHz		

† GE Healthcare's Vivid Ultra Edition S70N is designed for compatibility with commercially available contrast agents. Because the availability of these agents is subject to government regulation and approval, product features intended for use with these agents may not be commercially marketed nor made available before the contrast agent is approved for use. Advanced contrast features are only enabled on systems for delivery in countries or regions where the agents are approved for use or for investigational or research use.

	Applications	Description	Footprint	Biopsy Guide	Bandwidth	Field of View	Depth of Field
	Transesophageal						
 6VT-D	Cardiac, LVO Contrast,† Coronary	Active Matrix 4D Volume TEE Transducer	Tip 14 x 13 mm Length 45 mm		3.0 - 8.0 MHz	90°	20 cm
 6Tc-RS	Cardiac, LVO Contrast,† Coronary	TEE Transducer	Tip 12 x 14 mm Length 45 mm		3.0 - 8.0 MHz	90°	20 cm
 9T-RS	Pediatric Cardiac	TEE Transducer	Tip 11 x 8 mm Length 35 mm		3.0 - 10.0 MHz	90°	14 cm
 10T-D	Cardiac, Pediatric Cardiac	TEE Transducer	Tip 8 x 6 mm Length 16 mm		3.3 - 10.0 MHz	90°	18 cm
	Intracardiac Echo (ICE)*						
AcuNav® 8F G	Intracardiac	Catheter	8 Fr diameter		4.5 - 11.5 MHz	90°	16 cm
AcuNav 10F G	Intracardiac	Catheter	10 Fr diameter		4.5 - 11.5 MHz	90°	16 cm
SOUNDSTAR® 3D 10F G	Intracardiac	Catheter	10 Fr diameter		4.5 - 11.5 MHz	90°	16 cm
SOUNDSTAR eco 10F G	Intracardiac	Catheter	10 Fr diameter		4.5 - 11.5 MHz	90°	16 cm
SOUNDSTAR eco 8F G	Intracardiac	Catheter	8 Fr diameter		4.5 - 11.5 MHz	90°	16 cm

† GE Healthcare's Vivid Ultra Edition S70N is designed for compatibility with commercially available contrast agents. Because the availability of these agents is subject to government regulation and approval, product features intended for use with these agents may not be commercially marketed nor made available before the contrast agent is approved for use. Advanced contrast features are only enabled on systems for delivery in countries or regions where the agents are approved for use or for investigational or research use.

* ICE catheters are not available in all countries. Please contact Biosense Webster directly. ®AcuNav is a registered trademark of Siemens Healthineers.

®SOUNDSTAR is a registered trademark of Biosense Webster, Inc.

About GE Healthcare

GE Healthcare provides transformational medical technologies and services to meet the demand for increased access, enhanced quality and more affordable healthcare around the world. GE (NYSE: GE) works on things that matter - great people and technologies taking on tough challenges. From medical imaging, software & IT, patient monitoring and diagnostics to drug discovery, biopharmaceutical manufacturing technologies and performance improvement solutions, GE Healthcare helps medical professionals deliver great healthcare to their patients.

GE Healthcare
9900 Innovation Drive
Wauwatosa, WI 53226
USA
www.gehealthcare.com

JB80811XX

About GE Healthcare

GE Healthcare is a leading global medical technology and digital solutions innovator. GE Healthcare enables clinicians to make faster, more informed decisions through intelligent devices, data analytics, applications and services, supported by its Edison intelligence platform. With over 100 years of healthcare industry experience and around 50,000 employees globally, the company operates at the center of an ecosystem working toward precision health, digitizing healthcare, helping drive productivity and improve outcomes for patients, providers, health systems and researchers around the world.

Follow us on Facebook, LinkedIn, Twitter and Insights , or visit our website www.gehealthcare.com for more information.

1. Forecasting the Future of Cardiovascular Disease in the United State, AHA Policy Statement, 2011, source: CIR.0b013e31820a55f5
2. Source: Healthcare Infrastructure and Procedural Volume for Ultrasound Imaging, Frost & Sullivan, 2018. Approx. 108.12 million echo exams are performed annually; Calculation based on 26% total global prevalence of CVD cases (422 million) undergoing echo exam; extrapolated from US study indicating roughly 26% of total prevalent CVD cases underwent echo exams percentage value validated from reports.https://www.prb.org/wp-content/uploads/2015/12/2015-world-population-data-sheet_eng.pdf
3. Kurt M, Shaikh K, Peterson L, et al. Impact on contrast echocardiography on evaluation of ventricular function & clinical management in a large prospective cohort. J Am Coll Cardiol. 2009; 53(9):802-810
4. Work Related Musculoskeletal Disorders In Sonography, Society Of Diagnostic Medical Sonography, 2018, Susan Murphey, BS, RDMS, RDCS, CECD https://www.sdms.org/docs/default-source/Resources/work-related-musculoskeletal-disorders-in-sonography-white-paper.pdf?sfvrsn=8
5. The Role of AI in Streamlining Echocardiography Quantification White Paper, Kristin McLeod - JB80498XX
6. Based on results of time and motion study conducted by GE "JB49055XX - Cardiac Auto Doppler"; study results indicated time savings related productivity increase up to ~8 on an annual basis for a facility per sonographer
7. European Association of Echocardiography recommendations for standardization of performance, digital storage and reporting of echocardiographic studies (Eur Journal of Echo 2008 – Evangelista, Badano, Monaghan, Zamorano, Lancellotti).
8. Recommendations for Quantification of Doppler Echocardiography: A Report From the Doppler Quantification Task Force of the Nomenclature and Standards Committee of the American Society of Echocardiography (JASE 2002)
9. Centricity Cardio Workflow v7 Intelligent Reporting out-of-the-box configuration compared to 2017 IAC guidelines excluding doppler. CCW Intellgent Reporting Outcome - JB74831XX
10. EchoPAC Suite is a marketing name for EchoPAC Plug-in
11. With the DICOM SR support, Measures & Analysis (M&A) for an exam can be sent at the end of the exam or when exported from local archive. The destination can be either a server on the network (Storage SCP) or a removable media (DICOM Media) depending on the DICOM dataflow selected. Custom measurements supported only for Adult Echo (TID5200) and Pediatric Heart (TID5220).
12. https://www.ncbi.nlm.nih.gov/pubmed/27689562
13. Data Breaches Will Cost Healthcare $4B in 2019, Threats Outpace Tech, healthitsecurity, source: t.ly/xrAA
14. 5 Tips for Controlling Costs in Hospitals and Biomed Shops, source: t.ly/I9n7
15. Errors in Sonography, DOI: 10.1007/978-88-470-2339-0_8. https://www.researchgate.net/publication/279616130_Errors_in_Sonography
16. e. a. M. Mårtensson, «High incidence of defective ultrasound transducers in use in routine clinical practice», European Journal of Echocardiography, vol. 10, no. 3, pp. 389-394, 2009. https://academic.oup.com/ehjcimaging/article/10/3/389/2396618 https://probehunter.com/wp-content/uploads/FULLTEXT01.pdf
17. A multicentre survey of the condition of ultrasound probes, Ultrasound. 2016 Nov, Published online 2016 Aug 1. doi: 10.1177/1742271X16662301. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5098704/
18. GE internal data
19. Digital Expert is only offered in the USA

JB80430XX

By 2030,

40.5%

of the US population is projected to have some form of Cardiovascular Disease (CVD)[1]

~108m

annual echo exams performed globally[2]

WORKLOAD IS HIGH.

WHILE ENERGY AND DETERMINATION PERSIST.

Demand for cardiovascular ultrasound exams is high and will continue to increase, with a mix of routine, follow-up and complex cases.

Using advanced clinical capabilities traditionally required extra effort and expertise - often resulting in delays and increased workload.

We strive to maximize efficiency with a system that helps you see more, easily achieve accurate measurements and minimize errors.

10-15%

of echo exams result in sub-optimal images[3]

90%

of sonographers experience symptoms of Work Related Musculoskeletal Disorders (WRMSD)[4]

$120+

billion yearly

direct and indirect costs for employers[4]

Vivid S70N
Ultra Edition

Powered By Edison

Designed to provide you with uncompromised image quality, advanced visualization capabilities and easy measurements – while helping reduce tedious tasks and inter-observer variability. [5]

Leverage the cSound imaging platform

We are committed to support the vital work you do with patients every day. Leveraging artificial intelligence powered by GE Healthcare's Edison™ platform, we've taken the extraordinary processing capacity of our breakthrough software beamformer, cSound™, to a whole new level.
Empower your care team with the expanded advantages of artificial intelligence of the Vivid™ S70N Ultra Edition system.

Achieve clinical excellence

Advanced quantification tools provide you with the ability to evaluate problems and pursue the path forward. Count on a full suite of intuitive tools to make your work easy and efficient. Accomplish reproducible results with advanced capabilities for quantifying heart function and valve anatomy in 2D and 4D.

Master complex exams

Due to a growing population of difficult to scan patients, XDclear™ probes combined with cSound beamformer technology make a difference in many of your exams, helping you quickly and easily acquire diagnostic images with confidence and without contrast.

Optimize your practice

Standardized and simplified procedures help increase patient throughput and optimize productivity.
Help maximize efficiency with Automated Functional Imaging (AFI), assessment of the LV strain on all datasets, regardless of the system it was acquired on (i.e. vendor independent). Vivid S70N Ultra Edition also offers vast flexibility enabling superb performance in a range of exams including: stress-echo, vascular, abdominal, OB/GYN and small parts.

MODERN ERGONOMICS

A familiar, yet modern and efficient design.

Your time is precious.
Save it.

DETECTABILITY[5]
98%

AI AFI LV with AI View Recognition

Fully automatic recognition of the apical imaging views and measurements of GLS and segmental longitudinal Strain for LV.

POWERED BY AI

Improve diagnostic speed and accuracy

Vivid S70N Ultra Edition introduces the latest AI-based technology to help reduce tedious tasks and improve workflow efficiency. Diagnose more confidently and accelerate exams via automated (AI-driven) Cardiac Doppler and 2D LV measurements.

The results are impressive. Exam time is reduced, and operator fatigue minimized with up to 80% less clicks to get 2D measurements, and inter-observer variability diminished.[5]

Discover the many innovations brought by the Vivid Ultra Edition, and more importantly, how these can contribute to make clinical practice - Elevated by You.

Ultra Fast.
Ultra Precise.
Ultra Efficient.

AI Cardiac Auto Doppler with AI

REDUCED TIME PER MEASUREMENT

UP TO 93%

Fewer Keystrokes[6]

LOWER INTER OPERATOR VARIABILITY

REDUCE VARIABILITY

~3x

Standardized exams with greater reproducibility[6]

ACCELERATED WORKFLOW

Productivity improvement

POWERED BY AI

ELEVATED BY YOU

At GE Healthcare we strive to empower you by reducing wasted time and effort. We aim to remove tedious tasks and help make every moment count for your patients – seeing problems clearly and quickly, performing procedures with great precision... and providing quality of care for all.

Powered By Edison

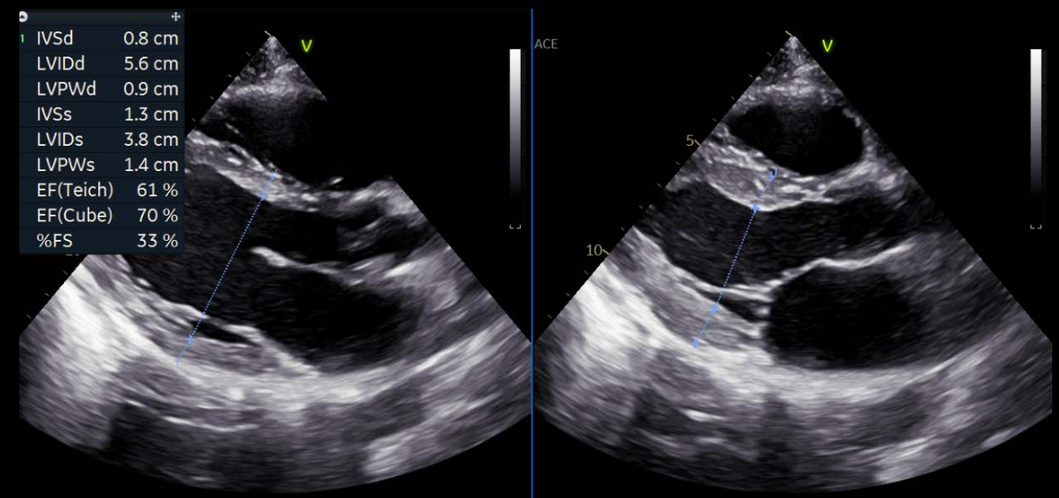
CLINICAL EXCELLENCE
for the Echo Lab

LESS CLICKS, UP TO[5]

-80%

AI Auto Measure 2D

With the power of AI, the manual caliper measurements can be completed with 3 clicks: **Freeze – Measure – Auto.** A full set of reproducible measurements will instantly appear on the screen.

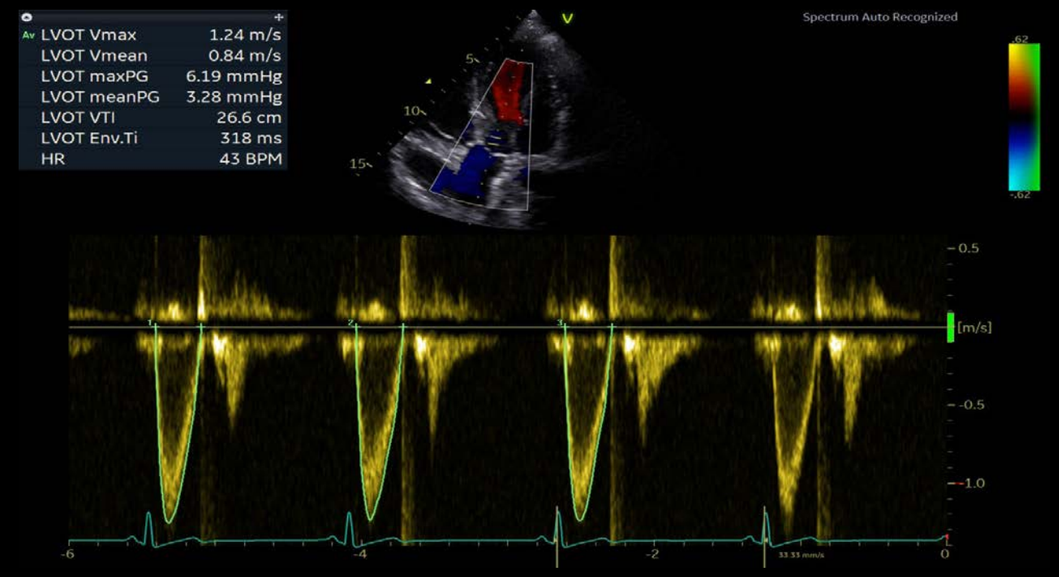


ACCURACY[5]

98%

AI Auto Measure Spectrum Recognition

With the power of AI, a wide range of Doppler measurements can be completed with 2 clicks: **Freeze – Measure.** A Doppler trace and full set of associated measurements will instantly appear on the screen.



CLINICAL EXCELLENCE

for Interventional Procedures

Demand for interventional procedures is growing and so are expectations of the heart team. Grow your capacity and capabilities with advanced ultrasound and conquer difficult cases.

Structural heart procedure success depends on preparation, collaboration and clear communication. This complex task is rewarding, and the entire team contributes.

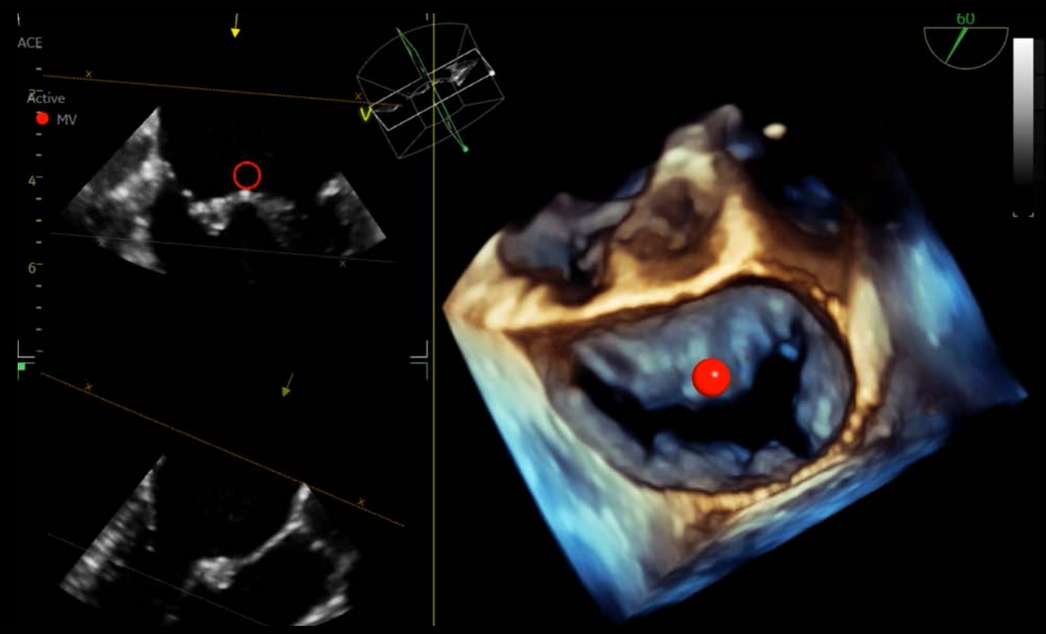
Vivid S70N Ultra Edition offers precise and uncomplicated tools to plan your interventions. With new visualization and navigation techniques, the heart team can see clearly, communicate quickly, and perform procedures with great precision.

HD Color

HD Color is a 4D color flow rendering technique for volumetric flow perception and semi-transparent visualization of origin and size of high velocity jets

4D Markers

Make annotations that are viewable from all angles on 4D ultrasound volume data sets and their 2D views, facilitating communication in the echo lab, cath lab and OR.



CLINICAL EXCELLENCE

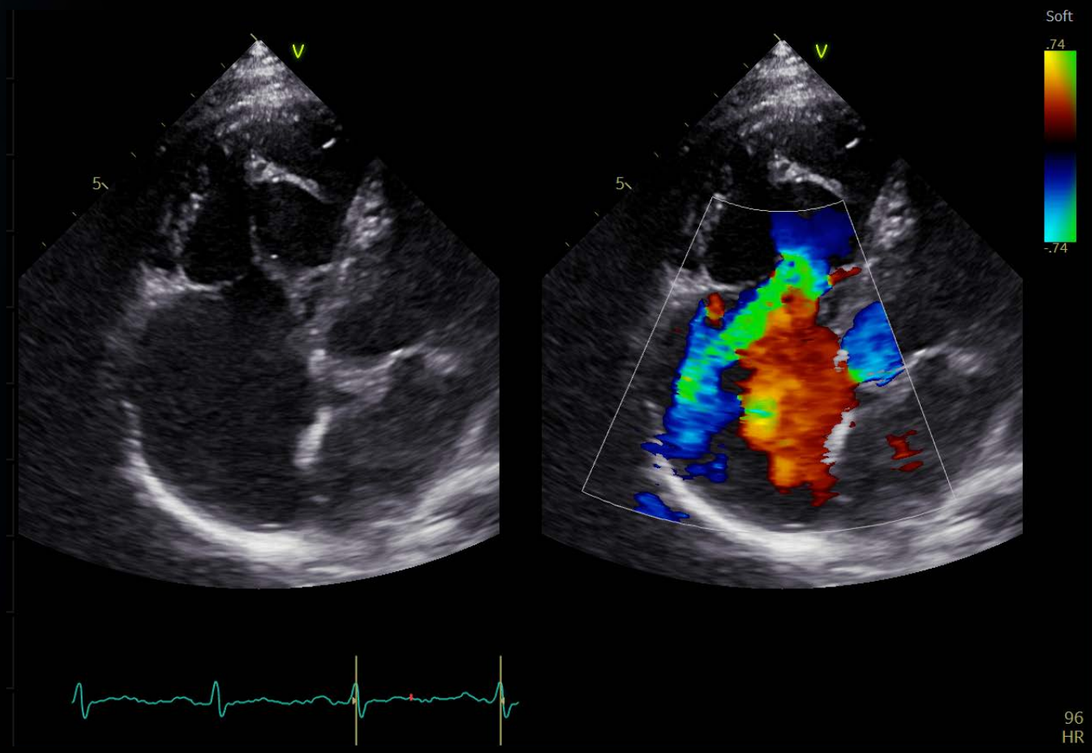
for Pediatrics

The smallest cardiac patients can pose the biggest care challenges with difficult to diagnose, severe conditions.

That's why GE Healthcare designed the high-end Vivid S70N Ultra Edition with the extraordinary processing power of cSound to help you evaluate and navigate the complexities of pediatric hearts with speed, clarity and confidence.

Pediatric imaging

Visualize small anatomies with speed, clarity and confidence thanks to Vivid S70N Ultra Edition's superb high-resolution imaging and dedicated pediatric probes.



CLINICAL EXCELLENCE

beyond Cardiology

The demand for multi-purpose, cost efficient ultrasound systems with uncompromised image quality is growing. Your Vivid S70N Ultra Edition will exceed your expectations across a wide range of applications.

While Vivid S70N Ultra Edition has been designed to address your needs for cardiac imaging, it proves very versatile as well, capable of providing you with superb images thanks to cSound technology, and diagnostic capabilities for a wide range of applications beyond the heart.

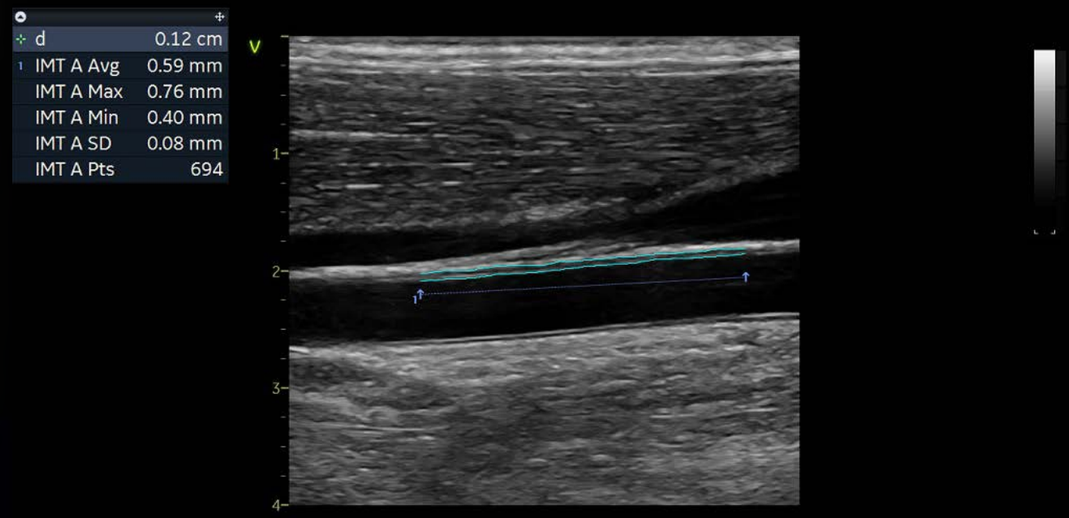
Vivid S70N Ultra Edition's efficient workflow, wide probe range and quantification tools ensure the confidence you need for speedy and accurate diagnosis also under challenging conditions.

Lightweight and slim, the Vivid S70N Ultra Edition is easy to maneuver. This facilitates your movements as you walk in the corridors from one department to another, and if need be, gives access to scanning at patient bedside.

Accurate diagnostics and precise measurements are achievable with premium image quality, dedicated presets and tools on your Vivid system.

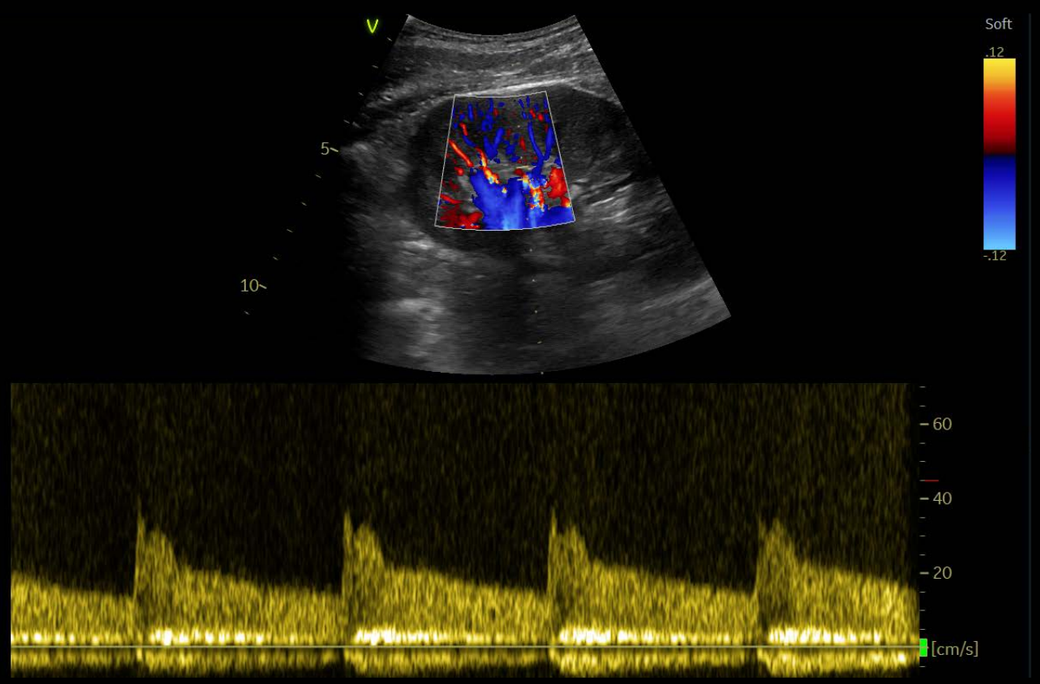
Vascular quantification

Develop fast and complete quantitative assessment of vascular anatomies, such as the Intima Media Thickness, with dedicated vascular measurement tools.

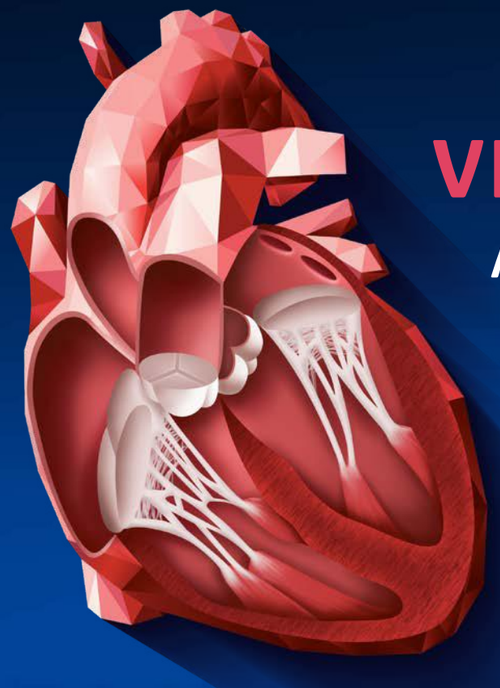


Abdomen diagnosis

Visualize tissues and flow patterns with greater details thanks to Vivid S70N Ultra Edition's high-resolution imaging.



Vivid S70N Ultra Edition



VIVID HEART APPLICATIONS

A wide range of clinical applications for use in Core Echo Lab, Interventional and Pediatrics.

VISUALIZATION AND NAVIGATION	Ultra Edition
4D Markers	HD Color
FlexiSlice	
FlexiViews	
View-X	

FLOW QUANTIFICATION	Ultra Edition
Cardiac Auto Doppler AI	AI Auto Measure Spectrum Recognition AI

VALVES AND CHAMBERS QUANTIFICATION	Ultra Edition
4D Auto AVQ	AI Auto Measure 2D AI
4D Auto MVQ	Auto EF AI
4D Auto LVQ	

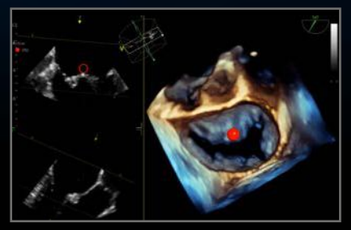
AFI FUNCTIONAL IMAGING	Ultra Edition
	AFI LV with AI View Recognition AI
	AFI RV
	AFI LA

APPLICATIONS POWERED BY AI

VIVID HEART APPLICATIONS

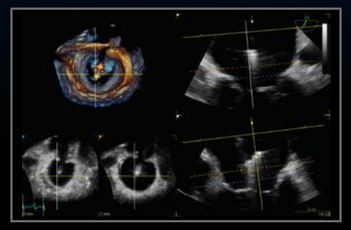
VISUALIZATION AND NAVIGATION

Why guess? When you can see.



4D Markers

Make annotations that are viewable from all angles on 4D ultrasound volume data sets and their 2D views, facilitating communication in the echo lab, cath lab and OR.



FlexiSlice

With a distance gauge and two viewing layouts, this interactive tool for obtaining 2D or render views in live or replay mode may provide enhanced insight as well as save time.

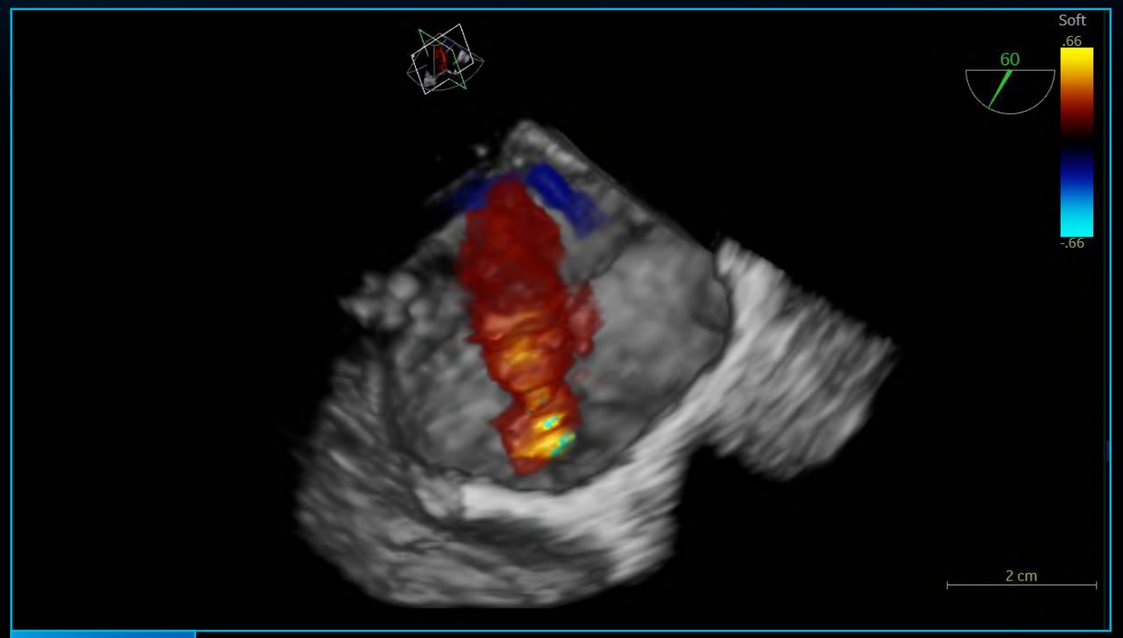
FlexiViews

Gain quick access to predefined 4D/ multiplane views during live mode, potentially reducing scan time during complex interventional procedures.

View-X

See X-ray from fluoroscopy in real time right on your Vivid S70N Ultra Edition screen as a picture in picture, facilitating communication between team members.

New in Ultra Edition



Ultra Edition

HD Color

4D color flow rendering technique for semi-transparent visualization of origin and size of high velocity jets.

Benefits:

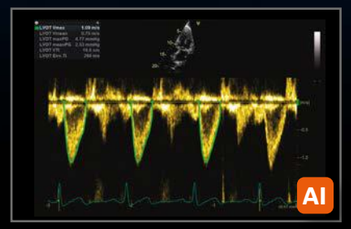
- Enhance spatial relationships between flow and the surrounding structures
- Suppress non-diagnostic low flow information
- Work seamlessly with other visualization techniques such as 4D markers
- Supports 4D color flow data also from previous releases

VIVID HEART APPLICATIONS

FLOW QUANTIFICATION

New in Ultra Edition

Your time is precious. Save it.

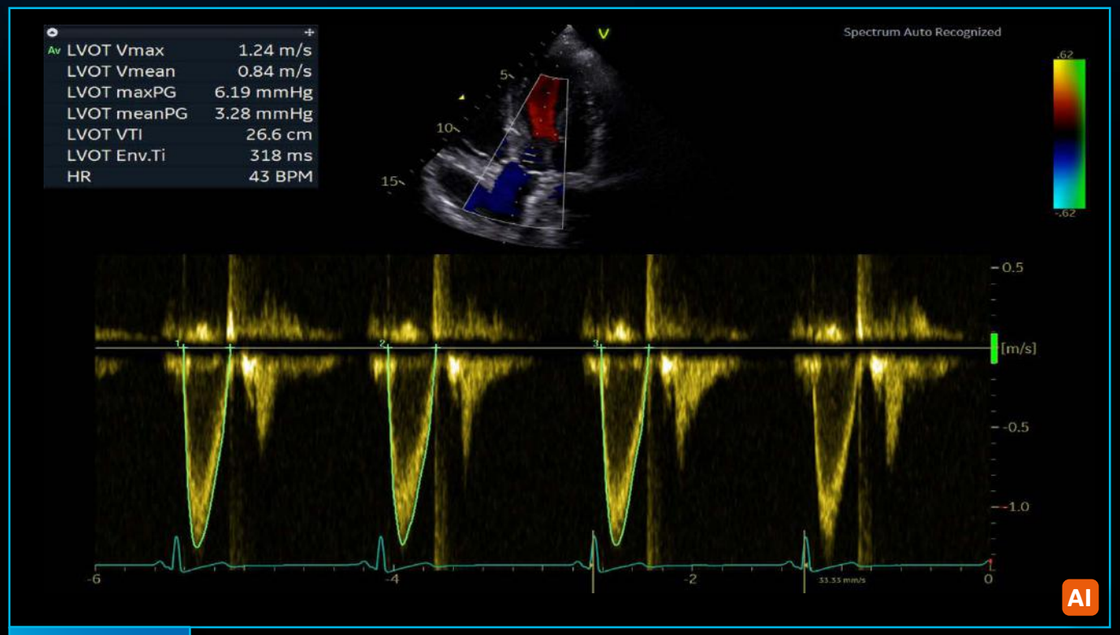


Cardiac Auto Doppler

Semi-automatic Cardiac Doppler measurements.

Benefits:

- Enhances reproducibility of follow-up studies when used in automated mode [6]
- Offers Doppler measurement in multiple cardiac cycles as recommended by guidelines for irregular heart rhythms [7,8]
- Supports less experienced users with advanced automation



Ultra Edition

AI Auto Measure - Spectrum Recognition

Semi-automatic selection of appropriate spectral Doppler measurement tool.

Benefits:

- Enables fewer manual interactions by automatically opening the appropriate measurement tool [5]
- Works seamlessly with Cardiac Auto Doppler
- Enhances reproducibility of follow-up studies when used in automated mode [5]
- Supports less experienced users with advanced automation

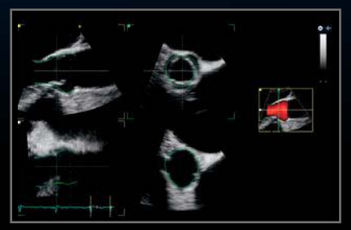
APPLICATIONS POWERED BY AI

VIVID HEART APPLICATIONS

VALVES AND CHAMBERS QUANTIFICATION

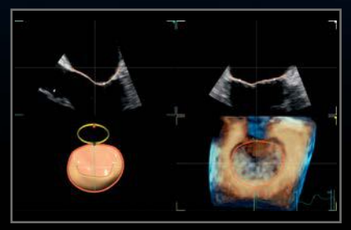
Precision at the heart of quantification.

New in Ultra Edition



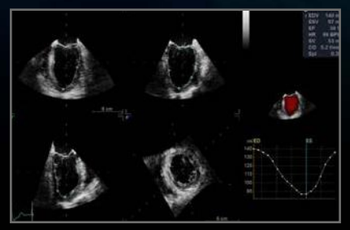
4D Auto AVQ

Automatically segment, align and quantify the aortic outflow tract – vital to device sizing and orientation for TAVI/ TAVR procedures.



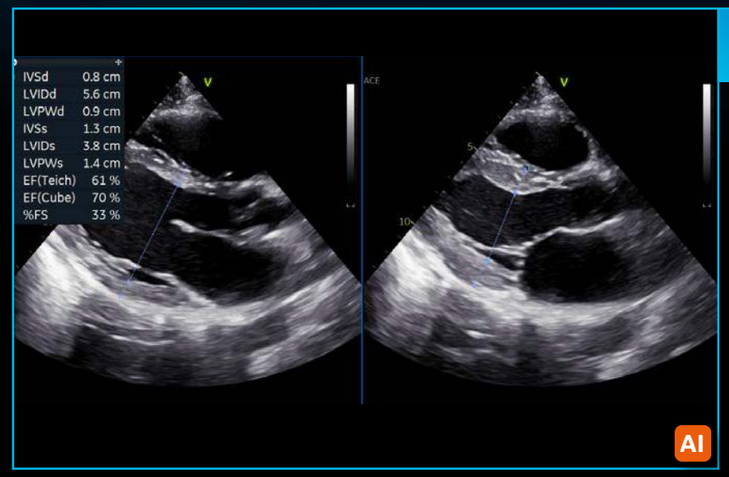
4D Auto MVQ

Supporting TEE images, this integrated package helps visualize and quantify the mitral valve via a semi-automatic, surface-detecting algorithm.



4D Auto LVQ

Adapted to work with full volume data sets acquired with the 4D TEE transducer, 4D Auto LVQ for TEE brings you a fast and easy automated method for left ventricle quantification, including volumes and ejection fraction.



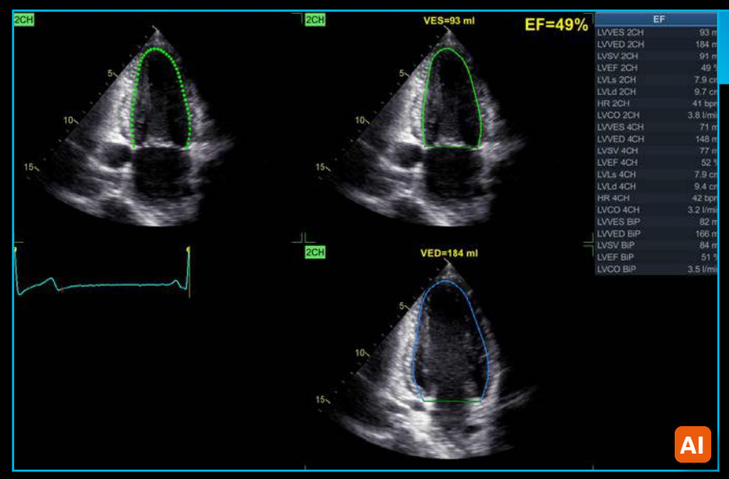
Ultra Edition

AI Auto Measure 2D

Semi-automated LV dimension measurements (2D calipers) in the parasternal long axis view, reducing manual interactions.

Benefits:

- Achieves fast measurements of left ventricle dimensions:
  - Up to 80% less clicks [5]
  - No need to scroll to look for ED and ES frames
  - Reduce manual workflow during analysis of cardiac images
- Improves reliability and repeatability of measurements – potentially increasing reproducibility for follow-up studies



Ultra Edition

Auto EF

Powered by AI-based View Recognition, Auto EF provides semi-automated quantification of left ventricular volumes and ejection fraction.

Benefits:

- Achieves fast measurements of ejection fraction
- DICOM® support. Assessment of the left ventricle ejection fraction also on data sets acquired on other vendors' systems

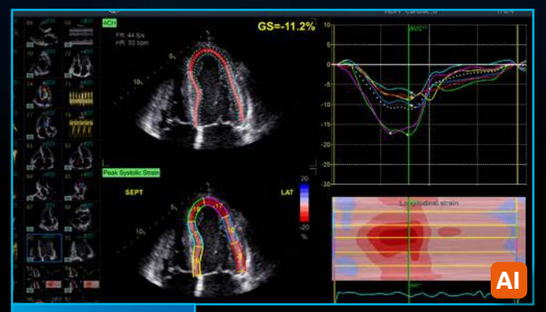
APPLICATIONS POWERED BY AI

VIVID HEART APPLICATIONS

AFI FUNCTIONAL IMAGING

From diagnosis to prognosis.

New in Ultra Edition



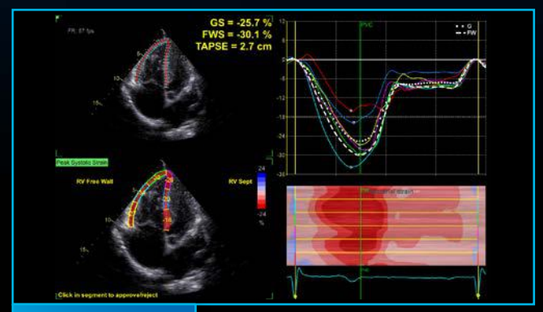
Ultra Edition

AFI LV with AI View Recognition*

Powered by AI-based View Recognition, AFI LV provides semi-automated quantification of left ventricular global and segmental strain.

Benefits:

- Offers advanced industry pioneered speckle tracking algorithm for quantifying myocardial deformation
- Works seamlessly - integrated ejection fraction calculation
- Supports Adult and Pediatric TTE and Adult TEE images
- Provides time savings via automatic selection of the appropriate 4-chamber, 2-chamber and APLAX images for analysis
- DICOM support. Assessment of the left ventricle ejection fraction also on data sets acquired on other vendors' systems



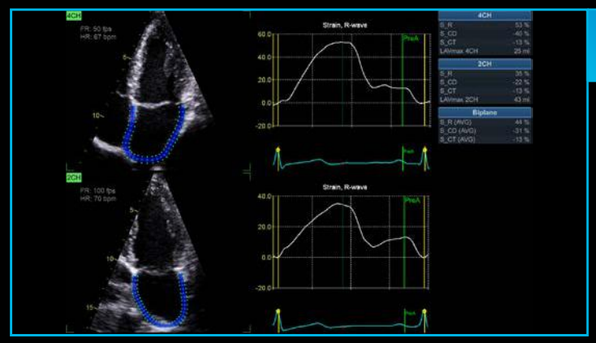
Ultra Edition

AFI RV

AFI RV is a novel tool to assess the right ventricular function by advanced speckle tracking echocardiography.

Benefits:

- Offers renown Vivid AFI user interface and workflow to allow current and new users easy adoption
- Supports right ventricle free wall strain, global strain and Tricuspid Annular Plane Systolic Excursion (TAPSE)
- Follows the 2018 EACVI-ASE Strain Standardized Task Force guidelines
- Supports right ventricle images also from previous releases



Ultra Edition

AFI LA

AFI LA Strain is a novel method to assess the left atrial function allowing global strain to be measured using speckle tracking echocardiography.

Benefits:

- Offers Vivid renown AFI user interface and workflow allowing users to easily adopt
- Supports left atrium strain, volumes and emptying fraction measurements
- Follows the 2018 EACVI-ASE Strain Standardized Task Force guidelines
- Supports left atrium images also from previous releases

*View Recognition is only applicable to images acquired with TTE probe on GE systems

APPLICATIONS POWERED BY AI

SEAMLESS WORKFLOW INTEGRATION

POST PROCESSING & REVIEW

OPEN STANDARDS

INTEGRATION WITH YOUR WORKFLOW

EchoPAC Software Only and EchoPAC Plug-in:

- Analyze and review data from GE Healthcare Vivid family of scanners, as well as DICOM images from other ultrasound systems.
- Access all Vivid measurement and review tools utilizing GE Healthcare Raw Data or industry standard DICOM data
- DICOM Image transfer with optional GE Healthcare Raw Data transfers images easily in your existing workflow
- DICOM SR Measurement Transfer including standard and custom measurement allows seamless integration with GE Healthcare and other industry reporting systems and EMRs [11]

EchoPAC Plug-in is available for:

- GE Healthcare Centricity™ Cardio Enterprise with Intelligent Reporting (IR).
- GE Healthcare ViewPoint™ 6 with EchoPAC Suite [10]
- As a plug-in to third party PACS

With Centricity Cardio Enterprise IR, routine adult echo reports are

83% **complete before the physician opens the exam to review.** [9]

SonoDefense

ADVANCED CYBERSECURITY AND DATA PRIVACY PROTECTION

Healthcare institutions are under growing threats of cyberattacks – and the implications for data security, patient privacy, and the quality and cost of care are staggering.

The SonoDefense strategy consists of SIX LAYERS, with each layer enhancing the overall security of the system and help protect patient data.

Protecting against these threats and safeguarding your patients and your institution requires more than anti-virus protection. SonoDefense is GE Healthcare's multi-layer strategic approach to cybersecurity and patient data privacy for ultrasound.

SonoDefense is designed to:

- Keep the ultrasound machine safe and functional in the face of cyberthreats
- Protect patient data on the machine from unauthorized access
- Enable you to successfully implement patient data and security policies, while still managing product daily workflows

SonoDefense strategy applies to Vivid portfolio:

- Windows® 10 IoT Secure Operating System provides multi-layered security
- Application whitelisting prevents malware execution
- Configurable user security provides user authenticationand access control
- Data encryption protects stored data and during transmission
- Network firewall disables unneeded operating system services
- Integrates with existing facility security infrastructure

Healthcare is a soft-target for hacking and ransomware.[12]

$4B **cost added in 2019**[13]

Ultrasound is especially vulnerable to operator-dependence leading to

VARIABILITY

between exams[15]

Constrained budgets increase pressure to

DO MORE with less[14]

and to optimize assets

Probe mishandling can lead to damage which can cause faulty data and may lead to incorrect medical decisions[16, 17]

[POP] PERFORMANCE OPTIMIZATION PARTNERSHIPS

Purchasing a GE Healthcare ultrasound is not only getting access to a high-technology or remarkable clinical applications. It's about enjoying a new user experience, at every step of ownership. We help you to outperform today, while preparing your department for tomorrow's challenges.

STAFF EXCELLENCE

A comprehensive portfolio of training for clinical and technical users.

Helping you and your team build customized development plans to foster excellence and increased confidence.

ASSET OPTIMIZATION

Customizable dashboards for asset utilization and consulting services to provide actionable insights.

Achieving more with your assets to improve patient care and realize department strategic plans.

PROACTIVE MANAGEMENT

Use digital technology and tools to minimize expensive and disruptive unplanned downtime.

Proactive monitoring to help reduce cost and revenue loss from unplanned failures and automated updates for peace of mind.

IMPROVED UPTIME

Best-in-class repair services to drive uptime. Fully scalable from full coverage to shared maintenance.

Thoroughly aligned with your own in-house capabilities, providing the right balance between staff autonomy and our expertise.

DEVICE PROTECTION

Keep your device state-of-the-art with software upgrades, new applications and security patches.

Optimizing your device to drive clinical and operational benefits and help you stay ahead of the game, without changing your equipment.

PROBE PERFORMANCE

Customizable portfolio of solutions for probe lifecycle needs to improve availability and performance.

Proactive probe care that may help you increase diagnostic quality, decrease cross-contamination risk and expand the life span of the transducers.

*Ready to make your Vivid **POP**?*

Complete lifecycle solution for clinical, operational & financial outcomes.
You take care of your patients, we'll take care of you.

PARTNERSHIPS DRIVE RESULTS

GE Healthcare is by your side to overcome these risks, helping you to:

- Keep your systems up and running, safe from breaches and cyberattacks
- Achieve more with your existing systems, without changing your investment plan
- Improve your activity, exam flow and staff planning, based on comprehensive data and reports
- Create comfort zone for your teams, reaching operational efficiency and clinical excellence
- Achieve high standard in probe-related cross-contamination and diagnostic errors

UNLEASH THE POWER OF CONNECTED DEVICES

Your Vivid system has been designed to provide you with an optimal user experience. Connectivity is the key element to enjoy it fully, whenever and wherever you need it, regardless of site access restriction and planning constraints.
Discover a new world of services, included in every package:

REMOTE TECHNICAL SUPPORT

Access to experts anytime, anywhere

InSite™ connectivity enables OnDemand and real-time access to remote GE Healthcare experts

- Reduce disruptions
- Decrease system downtime
- Improve asset usage and staff productivity

It provides secure remote connectivity without requiring any open inbound ports or VPN connection.

REMOTE FIX

UP TO 40%

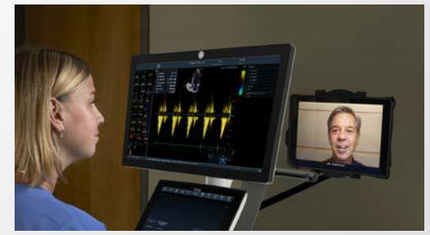
issues fixed remotely with InSite[18]

NEW REMOTE SUPPORT

Real-time and interactive applications support

Digital Expert[19] and **STAR** provide an interactive, real-time, flexible & convenient way to get education and support.

- May help improve training outcomes
- Increase capacity and efficiency
- Train staff on a short timeline



PREDICTIVE MAINTENANCE

Know the failure before it occurs

Transform unplanned downtime into planned service events with **OnWatch** technology. It provides automated, 24/7 system monitoring, capable of detecting a system failure before it occurs. Any deviation alerts our GE Healthcare engineers, who proactively work to keep your operations running smoothly.

COST SAVINGS

UP TO 90%

cost reduction, based on OnWatch alerts[18]

NEW AUTOMATED UPDATES

No need to worry about your system safety

Get automated software updates with **eDelivery** along with safety patches enabled by remote software download.
SonoDefense provides the highest level of cybersecurity to keep your systems up-to-date, with no impact on your operations. No on-site intervention needed.

DATA DRIVEN INSIGHTS

All the insights you need to decide, at your fingertips

Better decisions start with better data **iCenter™** is a secure, cloud-based asset management tool that offers comprehensive data analytics for your systems. It provides insights to make informed decisions and helps improve operational performance, optimize patient flow and maintain compliance standards.
UpdateMe is a complementary app that gives you access to the data 24/7 directly on your smartphone. You can receive notifications and create a service request anytime, anywhere.