



**PHILIPS**

Ultrasound

InnoSight

# **Simplicity** when and where you want it

Philips InnoSight specifications

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# 1. Introduction

Philips InnoSight allows you to scan patients in more of the places you deliver care, offering the clinical confidence that a quick, routine scan can provide in the physician office, clinic or hospital. This highly mobile, compact ultrasound system opens up the possibilities for you to bring ultrasound in more often, with capabilities that can help you perform even detailed studies, such as application-specific analysis packages, annotations and tissue-specific presets. Now you have a convenient system with quality Philips broadband transducers for scanning that can enhance both clinical confidence and the experience for your patients.



## 1.1 Applications

- Carotid
- Arterial
- Venous
- Thyroid
- Breast
- Bowel
- Musculoskeletal
- Nerve (deep and superficial)
- General abdomen
- Renal
- Obstetrics
- Gynecological
- Urology
- Adult cardiac
- Lung
- Transcranial Doppler
- FAST
- Fetal heart
- Testicle

### Optional portability

Specially designed, this optional sleek, low-footprint cart saves space and is height-adjustable with tilt-and-swivel capability for easy viewing. The wheeled trolley travel case makes it easy to move.\*

\* Cart and trolley travel case are optional. Not available in all geographies.

## 2. System overview

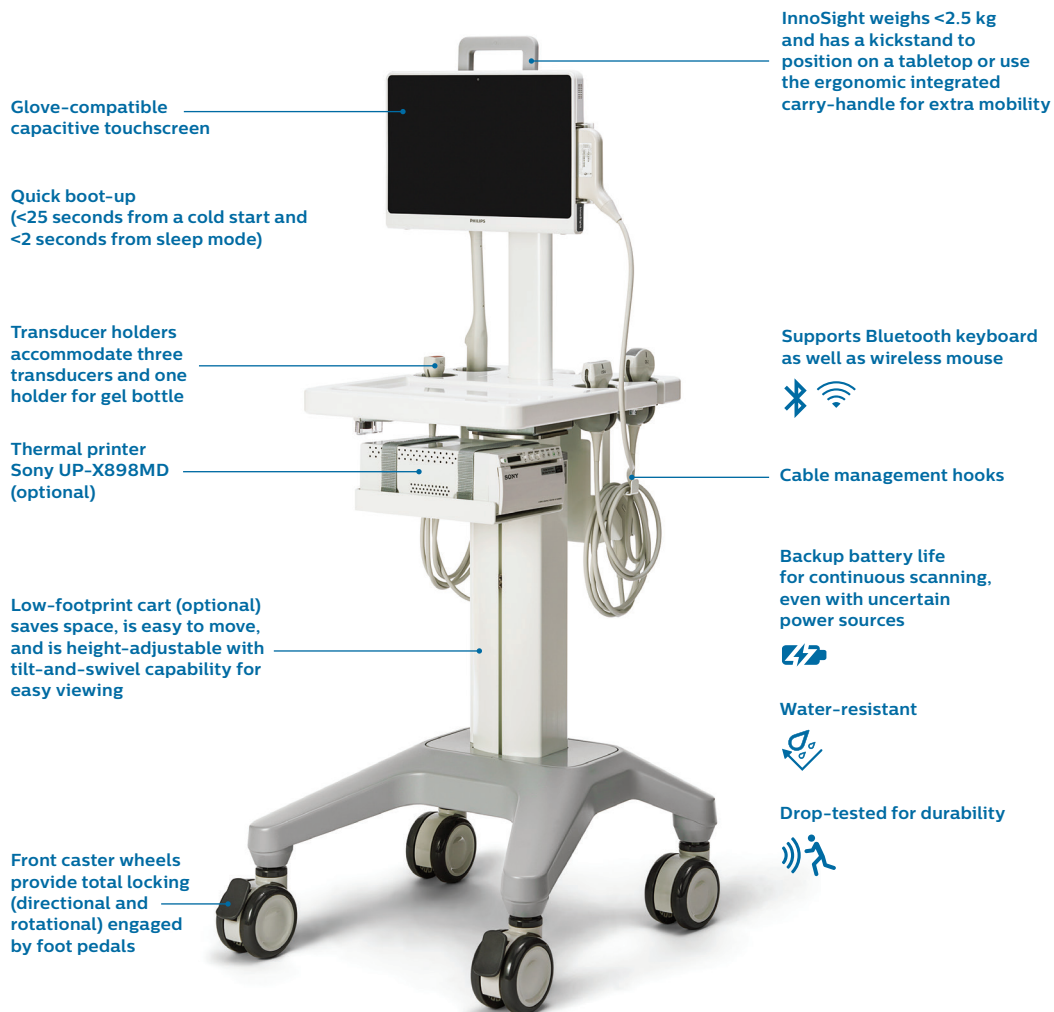
### 2.1 System overview

#### System architecture

- Next-generation all-digital compact broadband beamformer with pulse-shaping capability
- High-resolution A/D conversion with 258 dB system dynamic range
- 81,920 digitally processed channels
- Multivariate harmonic imaging including pulse inversion processing
- One-touch 2D optimization with broadband frequency compounding
- SonoCT real-time beam-steered compound imaging
- Advanced adaptive XRES image processing
- Continuously variable steering in 2D, color Doppler, and Doppler modes
- iSCAN one-touch intelligent optimization for 2D, color mode, and Doppler
- Active native data manipulation
- Tissue-specific imaging presets
- Gray shades: 256 levels (8 bit) in 2D, M-mode and Doppler

### 2.2 Imaging modes

- 2D
- M-mode
- Anatomical M-mode
- Color Doppler
- Color Power Angio (CPA) imaging
- Directional Color Power Angio
- Pulsed wave (PW) Doppler
- Continuous wave (CW) Doppler
- 2D and color compare mode
- Dual mode
- Duplex and triplex mode
- Triplex for simultaneous 2D, Doppler and color or Color Power Angio
- Tissue Harmonic Imaging (THI)
- Pulse Inversion Tissue Harmonic Imaging
- Trapezoidal imaging
- Full-screen mode with distance measurement and image save functionalities
- Quad View for AFI calculation







Equally enticing on the cart or off the cart.

## 2.3 Imaging modes and system controls

### 2D grayscale

- Available on all imaging transducers
- Smart TGC: pre-defined TGC curves optimized for consistently excellent imaging with minimal TGC adjustment
- Cineloop and image review
- Sector size for sector and curved array image formats and steerable control in linear image formats
- Dual mode imaging with cine loop and 2D image
- Chroma imaging with multiple maps
- 256 (8 bits) discrete gray levels
- 2D acquisition frame rate up to 300 frames/sec (dependent on field-of-view, depth and angle)

### M-mode

- Available on all imaging transducers
- Selectable sweeping rates
- Time markers: 0.2 and 1.0 seconds
- Configurable display format (1/3-2/3, 2/3-1/3, 1/2-1/2, side by side, full screen)
- Chroma colorization with multiple color maps
- Cineloop review for retrospective analysis

### Pulsed wave Doppler

- Available on all imaging transducers
- Adjustable sample volume size: 0.23–20 mm (transducer-dependent)
- Simultaneous or duplex mode of operation
- Simultaneous 2D, color Doppler or CPA, pulsed Doppler
- iSCAN optimization automatically adjusts scale, baseline, and Doppler gain

### Continuous wave Doppler

- Available on cardiac sector array transducer
- Steerable through 75° sector
- Maximum velocity range: 4.2 m/sec (sector transducer)

### Anatomical M-mode

- Available for all imaging transducers
- Up to three simultaneous M-mode traces
- Uses 2D image as a basis for M-mode analysis at a defined line, independent of transducer orientation
- Provides data on direction, position and timing of any single echo received from any point of the tissue for M-mode analysis in any direction, for examining cardiac chamber diameters, LV regional wall motion and location of accessory pathways

### Color Doppler

- Cineloop review with full playback control
- Advanced motion suppression with intelligent algorithms; adapts to various application types to selectively eliminate color motion artifact
- 256 color bins
- Touch-controlled color Region of Interest: size and position
- Maps, filters, line density, smoothing, echo write priority, color persistence and gain and baseline are user selectable
- Velocity display
- Color invert in live and frozen imaging
- User-selectable smoothing control
- User-selectable persistence control
- Color/2D line density control

### Tissue Harmonic Imaging

- Second harmonic processing to reduce artifacts and enhance image quality
- Multivariate pulsing including pulse inversion phase cancellation technology for increased detail resolution during harmonic imaging
- Available on all imaging transducers
- Extends high-performance imaging capabilities to all patient body types
- Supports SonoCT (harmonic SonoCT) and XRES modes

### Color Power Angio imaging

- Highly sensitive mode for small vessel visualization
- Available on all imaging transducers
- Cineloop review
- Multiple color maps
- Individual controls for gain, PRF, filters, echo write priority and map
- Adjustable CPA Region of Interest: size and position
- User-selectable persistence
- Directional Color Power Angio (DCPA) mode



### **SonoCT real-time compound imaging**

- Available on all curved transducers and linear array
- Decreases virtually all clutter and artifact
- Operates in conjunction with Tissue Harmonic Imaging
- Operates in conjunction with XRES imaging

### **XRES adaptive image processing**

- Available on all transducers
- Reduces speckle noise and enhances border definition
- Operates in conjunction with Tissue Harmonic Imaging, and duplex Doppler
- Operates in conjunction with SonoCT imaging
- Provides algorithms for advanced speckle reduction, refined tissue pattern displays and fine border definitions
- Up to five different levels dependent on transducer and application

### **Expanded field of view (trapezoidal imaging)**

- Expands field of view on linear array transducers up to 15° on each side in all imaging applications

### **Needle visualization**

- Available on the L12-4 transducer
- Provides enhanced visualization of the in-plane needle
- Central line placement
- Biopsy guidelines

### **Active native data**

- 2D image controls that can be changed in review include: gray map, Chroma map, orientation (L/R, U/D), display zoom/pan, XRES, persist
- PW and CW Doppler controls that can be changed include: baseline, video invert, angle correct, sweep speed, Chroma maps and PW trace (High Q controls)
- Color image controls that can be changed in review include: baseline, color map, invert, smoothing and persist
- Images can be acquired in prospective and retrospective timing sequences
- Images are acquired at acoustic data frame rate
- Available in cineloop and quick review modes

## **2.5 Workflow**

### **Ergonomics**

- High-resolution (1366 x 768 pixels) LCD display with wide viewing angle
- Imaging area: 832x640 pixels
- Full screen mode: 998x768 pixels
- Function keys and active mode
- Glove-compatible capacitive touchscreen
- Multi-touch based gesture on zoom, depth, gain, freeze/unfreeze, Doppler scan line, Doppler baseline, image/cine acquisition, play previous/next image, play cine
- Touch-based TGC control
- Height-adjustable optional cart with tilt-and-swivel
- Disinfectant-cleanable surface

## **2.4 Advanced imaging controls**

### **iSCAN image optimization**

- In 2D mode, one-button automatic adjustment of TGC and receiver gain to achieve optimal uniformity and brightness of tissues
- Color iSCAN will adjust color gain, PRF and baseline
- In Doppler mode, one-button automatic adjustment of:
  - Doppler PRF based on detected velocity
  - Doppler baseline based on detected flow direction
  - Gain to achieve optimal brightness of spectral waveform
- One-touch image optimization
- Available on all imaging transducers
- Operates in conjunction with SonoCT and XRES imaging

### Control panel and user interface

- Easy-to-learn graphical user interface with gesture-based controls
- Left- or right-side design of primary controls readily accessible and logically grouped
- Dual-function mode switch and independent gain controls for 2D, CPA and color Doppler
- Tri-state control panel lighting (active, available and unavailable)
- Eight-slide touch control adjustment of TGC curve
- iSCAN control for 2D/Doppler/color automatic optimization
- Pan/zoom control
- Freeze control
- Transducer selection and tissue specific imaging control
- Report and review controls
- Active function control available in duplex and triplex
- Integrated system tutorial

### Display annotation

- On-screen annotation of all pertinent imaging parameters for complete documentation, including transducer type and frequency, active clinical options and optimized presets, display depth, grayscale, color map, frame rate, compression map value, color gain, color image mode, hospital name and patient demographic data
- User-selectable display of patient birthdate or user ID
- Patient name can be turned off (hidden) for generating images used in publication and presentation
- Scan plane orientation marker
- Real-time display of mechanical index (MI)
- Real-time display of thermal index (TIb, TIs)
- Pre-defined body markers, supported in single- and dual-imaging formats
- Doppler baseline invert in live and frozen imaging
- Thumbnail display of images stored
- Calculation results and analysis labels
- User-friendly menus that allow navigation to other analysis features

### Image presentation

- Up/down
- Left/right
- Multiple duplex image formats
- Depth from 1 to 28 cm (transducer-dependent)
- Color invert

### Cineloop review

- Acquisition, storage and display in real time and duplex modes of up to 20 seconds for quick review of 2D and color images

## 2.6 Connectivity

- Two USB ports on the system
- DICOM store
- Modality worklist (MWL)
- Export to PC format: Image (bmp, jpeg, png); cine (mp4)

- Export to DICOM format: RGB
- Gigabit Ethernet
- Wireless "A, B, G and N" networking
- Support for optional small B/W or color printers
- Support Bluetooth keyboard as well as wireless mouse
- HDMI output
- Wireless casting to smart display over Wi-Fi

## 2.7 Storage

- USB 2.0/3.0 disk or micro SD card for backup/restore data
- 128 GB internal storage can save ~5000 images
- Network share

## 2.8 Report

- Preloaded report template for different exam type built-in prompts, findings and comments
- POC-focused report templates (ACEP)
- Export to DICOM (pdf and png formats)
- Print preview
- Single-page report format
- Report printing to thermal printer

## 2.9 Customization

- User-defined preset
- User-defined measurements
- User-defined calculations
- User-preferred layout
- Localization
  - User-preferred date format (MM/DD or DD/MM)
  - User interface languages:
    - English, German, Italian, French, Spanish, Brazilian Portuguese, Simplified Chinese, Traditional Chinese, Russian, Dutch
  - IFU/user manual languages:
    - V 1.0.x: English, French, Italian, German, Spanish, Simplified Chinese, Traditional Chinese, Brazilian Portuguese, Russian, Kazakh, Polish, Romanian, Czech, Ukrainian, Lithuanian, Hungarian, Slovak, Croatian, Bulgarian, Indonesia (Bahasa), Turkish, Estonian, Serbian, Bosnian, Latvian, Dutch, Greek, Korean
    - V 1.1: English, French, Italian, German, Spanish, Simplified Chinese, Traditional Chinese, Brazilian Portuguese, Russian, Polish, Hungarian, Dutch, Indonesia (Bahasa), Turkish, Korean, Danish

## 3.0 Security

- Hardened proprietary operating system developed on AOSP
- Closure of unused ports and disabled, unnecessary services
- Multi-user account management and secure access control
- Complex password policy
- Patient data encryption
- Encrypted data backup
- Configurable auto log out, lockout functionality
- Exportable system logs with date and time stamp

# 3. Transducers

## 3.1 Transducer selection

- User-customizable imaging presets for each transducer
- Continuous dynamic receive focusing on all imaging transducers

### Curved arrays

#### **C6-2 curved array**

- 6 to 2 MHz extended operating frequency range
- Curved array transducer with 128 elements and 72° field of view
- 2D, M-mode, steerable PW, color Doppler, Color Power Angio (CPA), SonoCT, advanced XRES and harmonic imaging
- General purpose abdominal, obstetrical, gynecological, renal, nerve and and urological applications
- Transducer support biopsy kits

#### **C9-4v curved array**

- 9 to 4 MHz extended operating frequency range
- 128-element transducer with 10 mm radius of curvature and 145° field of view
- 2D, M-mode, steerable PW and color Doppler, Color Power Angio, SonoCT, advanced XRES and harmonic imaging
- Obstetrical, gynecological and urological applications
- Transducer support biopsy kits

### Linear array

#### **L12-4 linear array**

- 12 to 4 MHz extended operating frequency range
- Fine pitch, high-resolution linear array, 128 elements
- 2D, M-mode, steerable PW and color Doppler, Color Power Angio, SonoCT, advanced XRES and harmonic imaging
- Carotid, arterial, venous, thyroid, breast, bowel, MSK, and nerve applications
- Transducer support biopsy kits

### Sector array

#### **S4-2 sector array**

- 4 to 2 MHz extended operating frequency range
- Sector array with 64 elements
- 2D, M-mode, steerable PW, CW and color Doppler, advanced XRES and harmonic imaging
- Adult cardiac application
- Transducer support biopsy kits

### Micro-convex curved array

#### **C83B curved array\***

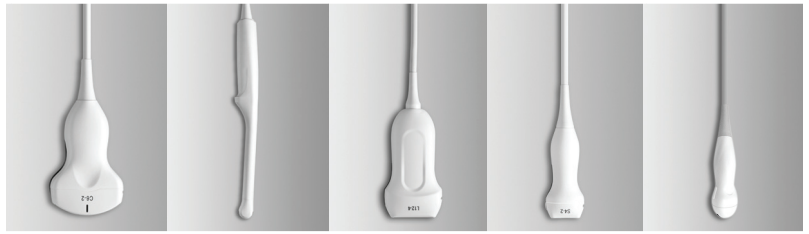
- 8 to 3 MHz extended operating frequency range
- Curved array with 128 elements
- Center frequency 6 MHz
- 2D, M-mode, Steerable PW and color Doppler, Color power angio and harmonic imaging
- Field of view 91.7°



\*The C83B transducer is manufactured by Qisda Corporation. C83B is also referred to as C8-3B.



## 3.2 Transducer application guide



Transducer		C6-2	C9-4v	L12-4	S4-2	C83B
Type of array		Curved	Curved	Linear	Sector	Curved
Number of elements		128	128	128	64	128
Scanplane aperture		63.7 mm	26.2 mm	38.4 mm	16.3 mm	22.4 mm
Field of view		72°	145°	38 mm	75°	91.7°
Broadband frequency range		6-2 MHz	9-4 MHz	12-4 MHz	4-2 MHz	8-3 MHz
Application	Exam type					
Abdominal	General	•			•	•
	Renal	•				
	Bowel			•		
	Vascular					
	Penetration	•				•
	Resolution	•				•
	Intervention					
Lung	General	•		•	•	
FAST	General	•			•	
Obstetrics	Early OB	•	•			
	OB	•	•			
	NT					
	Penetration	•	•			
Fetal	Early fetal heart					
	Fetal heart	•				
Gynecology	Pelvis	•	•			
	Fertility					
	Penetration	•	•			
Cardiology	Adult				•	
	Pediatric					•
	Epicardial					
	Epiaortic					
Vascular	Carotid			•		
	Arterial			•		
	Venous			•		
	TCD				•	
	Intraoperative					
	Intervention					
	Superficial					
Pediatric	Abdomen					•
	Hip					
	Neonatal cephalic					
Small parts	Superficial					
	General					
	Thyroid			•		
	Testicle			•		
	Breast			•		
	Nerve	•		•		
Musculoskeletal	Superficial					
	General			•		
Urology	Prostate					
	Bladder	•	•			
	Renal	•				
Biopsy guides		•	•	•	•	

## 4. Measurements and analysis



### 4.1 Measurement tools and general description

- 2D distance
- 2D circumference/area by ellipse, continuous trace
- 2D curved-linear distance
- 2D angle: intersection of two lines
- In 2D, three distances to calculate volume
- In 2D, hip angle tool
- M-mode distance (time, slope)
- M-mode heart rate calculation
- Manual Doppler trace

#### High Q automatic Doppler analysis

- Retrospective tracing

#### Display

- Time-averaged peak velocity
- Time-averaged mean velocity
- Acceleration times
- Resistive index
- Pulsatility index
- Systolic/diastolic ratio
- Illustrated High Q

### 4.2 Clinical option analysis packages

#### Cardiac analysis

- 2D mode ejection fraction (Simpsons)
- M-mode ejection fraction (via Teichholz)
- LV mass
- Peak velocity
- Max gradients
- Pressure half-time
- Slope
- Diastolic function
- Cardiac output
- Acceleration time
- Heart rate

#### Vascular analysis

- Percent diameter and area reduction
- User comments
- High Q Doppler analysis

#### OB analysis

- Fetal biometry (up to quadruplet)
- AFI calculation with Quad View mode
- Early gestation
- Fetal long bones
- Fetal Doppler
- Biophysical profile
- OB growth charts

#### Gynecology

- Uterine volume
- Right and left ovary volumes
- Right and left follicles
- Endometrial thickness
- Cervix length

#### General imaging

- General
- User-defined labels

#### Small parts

- Thyroid volume
- Testis volume
- Breast mass volume

#### Advanced quantification tool

- Intima Media Thickness (IMT) measurement
  - Automated assessment of the IMT on user-selected frames
  - For carotid and other superficial arteries

# 5. Physical specifications

## System dimensions

Length	319.6 mm/12.58 in
Width	223.2 mm/8.79 in
Height	31.8 mm/1.25 in (without kickstand) 52.6 mm/2.07 in (with kickstand without four dock locator pins) 62.3 mm/2.45 in (with kickstand and four dock locator pins)
Weight	2.46 kg/5.42 lb (with kickstand and four dock locator pins)
Display	294.64 mm/11.6 in high-resolution display with wide viewing angle

## Physical features

- High-resolution display with wide viewing angle (AHVA)
- Glove-compatible capacitive touchscreen
- Ergonomic integrated carrying handle
- Multiple transducer module (optional)\*
- Multiport adapter\* connects up to three transducers
- Trolley travel case\* (optional)

## Mobility cart

Weight	27.7 kg/61 lb
Width	486 mm/19.13 in
Depth including handle (from pedals)	566 mm/22.31 in
Height from ground to top of the cart	Adjustable from 1186 mm/46.69 in to 1486 mm/58.50 in
Height from ground to the top of the table	Adjustable from 788 mm/31.02 in to 1088 mm/42.83 in
Casters	Four caster wheels; front two caster wheels provide total locking (directional and rotational) engaged by the foot pedals

## Quick-release latch

- Simple latch system to secure the system on cart
- Easy to mount and unmount the system from cart
- System's integrated handle accessible from front for secure maneuverability

## Trolley travel case\*

- Dimensions: 44 cm/17.32 in x 23.5 cm/9.25 in x 36 cm/14.17 in (H x W x D)
- Weight: 3 kg/6.6 lb (when empty)
- Safely accommodates InnoSight system, transducers, power cord and gel in designated compartments
- Easy to transport with rugged wheels
- Dual-height retractable handle

## Storage

- One rear-mounted holder for adapter
- One front-mounted holder for printer
- Two integrated transducer connector holders
- Cable management hooks
- Transducer holders accommodate three transducers and one holder for gel bottle
- Thermal printer Sony UP-X898MD

## Power requirements

- Adapter AC input: 100-240 VAC, 50/60 Hz, 1.7 A (max)
- Adapter DC output: 19 V, 3.4 A

## Power management

- Fully charged new battery yields approximately 1.5-hour battery life under continuous use without AC; actual time varies with age and condition of battery
- Power-off battery charging time from empty to full within three hours
- Battery/AC monitoring circuitry includes on-screen graphics and low battery warning; there is also a power LED indicator for power-off charging.
- Sleep mode for instantaneous boot-up between exams

## Service

- System management for software update and maintenance of configuration
- Diagnostic tool for troubleshooting hardware function
- Extended warranty options
- Up to 5 years of warranty

## Environmental

- Operation range: 10-40° C/50-104° F operating in 20-85% relative humidity

## Electrical safety standards

- Medical Electrical Equipment, Part 1: General Requirements for Safety [IEC 60601-1:2006; national deviations shall be considered and incorporated as they become available]
- Medical Electrical Equipment, Part 1: 2. Collateral Standard: Electromagnetic Compatibility - Requirements and Test [IEC 60601-1-2:3rd Edition]
- Medical Electrical Equipment - Particular Requirements for Safety: Ultrasonic Medical Diagnostic and Monitoring Equipment IEC 60601-2-37 Second/2008 + AM 1:2011
- IEC 60601-1, Edition 3.1 2012-08

## Safety requirements

- Electrical equipment
  - EN 60601-1, European Norm, Safety of Medical
  - EN 60601-1-2 European Norm, Collateral
- Standard: Electromagnetic compatibility
  - EN 60601-2-37 European Norm, Particular requirements for the safety of ultrasonic medical diagnostic and monitoring equipment
  - SGS North America Certification Mark
- Agency approvals
  - CE Mark in accordance with the European Medical Device

\*Multiport adapter and trolley travel case are optional. Not available in all geographies.

# 6. Maintenance and services

## Maintenance and services

- Xtend Coverage options provide peace of mind
  - Core-only and comprehensive options
  - Duration flexibility with three- or five-year coverage
    - 1 year standard warranty + 2 years Xtend Coverage = 3 years total coverage
    - 1 year standard warranty + 4 years Xtend Coverage = 5 years total coverage
- Easy customer access to diagnostic tasks enable seamless installation and exchange
- Remote service model includes centralized clinical and technical phone support with product or part exchange as applicable\*
- Three-tiered resolution strategy
  - Customer resolution via on-board diagnostics
  - Remote support engineer review and consultation
  - Product or part exchange or software upgrade
- On-board customer accessible tools:
  - Diagnostics
    - Ultrasound engine
    - Fan and temperature
    - Storage
    - Transducer
    - Battery
    - Connectivity
  - Software configuration control
- Customer-installable software
  - Access key provided by remote support engineer
  - Installation complete in less than 10 minutes
  - Configuration and patient data preserved on installation
- All software options are enabled by default, preventing the need to back up system options when completing an update or restore
- User-exportable log files viewable by remote support engineer for rapid diagnosis
- Factory reset enables patient data security when product or part is exchanged
- Spare parts availability for three years following end of production



\*Service agreement required for access to Philips Remote Services. Access to the Internet required. Not all remote features available in all countries. Contact your Philips representative for details.

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