



High-image quality, low dose

Philips MicroDose Mammography system, technical data sheet, US/Canada

Delivering high-image quality along with low dose imaging, Philips MicroDose Mammography system is designed to help you provide outstanding patient care. The system's unique, multi-slit scanning, photon counting technology results in high-quality breast images at low dose. The ergonomic operation facilitates fast exams and high-patient throughput, and makes it easy for users to focus on patients, rather than on the system. In addition, photon counting technology opens up opportunities for advanced future breast applications. Philips MicroDose uses standard protocols such as DICOM to facilitate integration in the digital environment in hospitals and clinics.

Key advantages

- Exclusive photon counting technology facilitates confident detection at low radiation dose
- Fast and efficient detector, eliminating the need for scout images, and ergonomic operation aid high-patient throughput
- Comfortable design and fast image acquisition enhance patient comfort

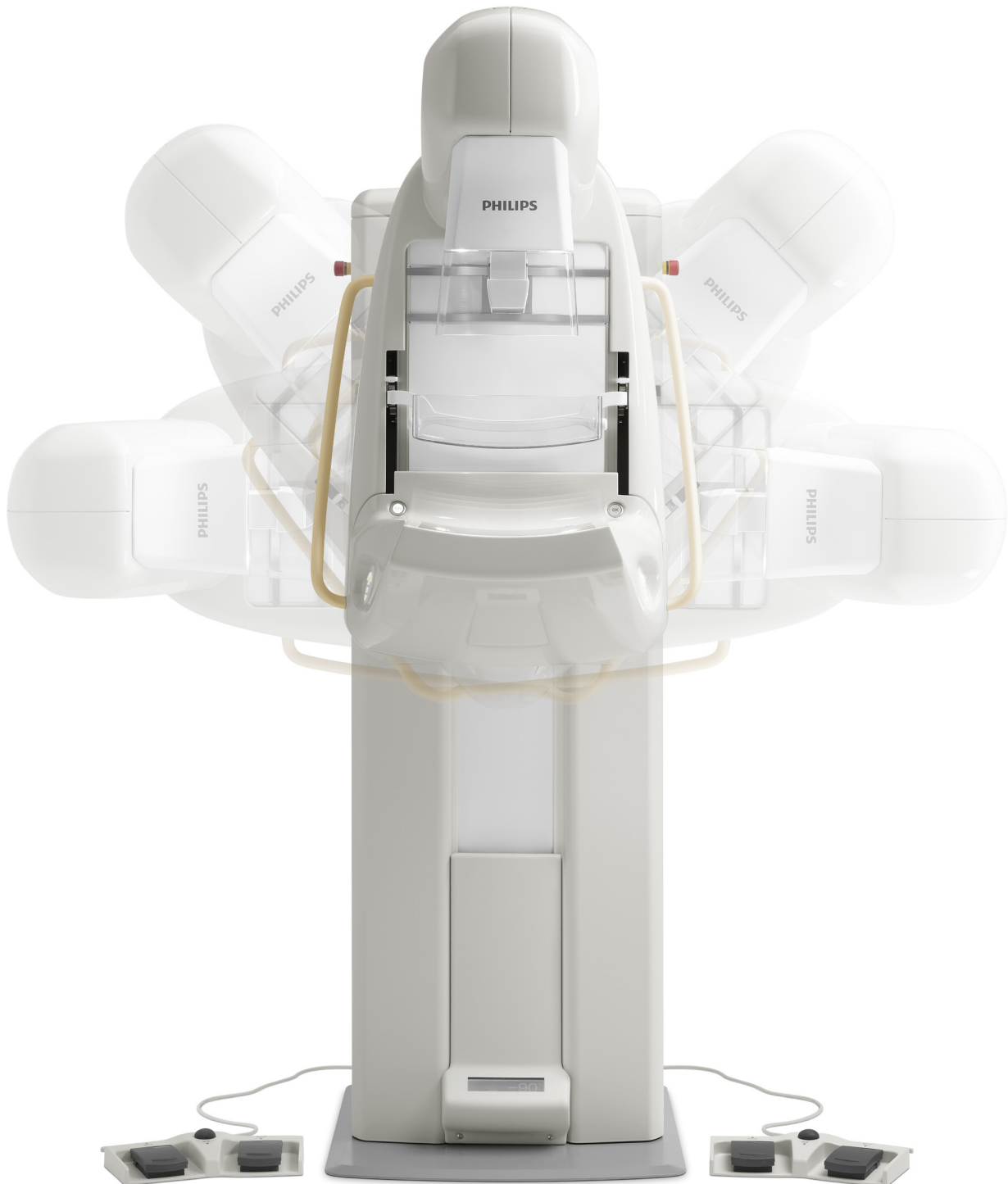
PHILIPS
sense and simplicity

Table of contents

1	Introduction	3
2	System components	4
2.1	Acquisition workstation	4
2.2	The mammography stand	4
2.3	Side cabinet	4
3	Acquisition workstation	5
3.1	Acquisition workstation	5
3.2	Hardware	5
3.3	Software	6
4	Mammography stand	7
4.1	The mammography stand, viewed with the full-motion range of the tube head	8
4.2	The mammography stand, viewed from the front	8
4.3	Mammography stand	9
4.4	High-voltage generator	9
4.5	Automatic Exposure Control	9
4.6	Scanning technology	10
4.7	X-ray tube	10
4.8	Detector	10
5	Side cabinet	11
5.1	Air-cooling (standard)	11
5.2	Water-cooling (optional)	11
5.3	Side cabinet	11

1. Introduction

Philips MicroDose Mammography system is a full-field digital mammography (FFDM) system.



2. System components

2.1 Acquisition workstation

Feature
Height-adjustable work table
Dedicated shortcut keypad for frequent functions
Flat screen monitor (1MP or 3MP)
Radiation protection shield (standard or large)
Exposure foot switch (optional)

2.2 The mammography stand

Feature
Direct digital photon counting detector
Tungsten X-ray tube and high-voltage generator
Multi-slit scanning, collimator system
Standard compression paddle
High-edge compression paddle
Small-size compression paddle
Medium-size compression paddle (optional)
Spot compression paddle (optional)
Needle examinations package (optional)

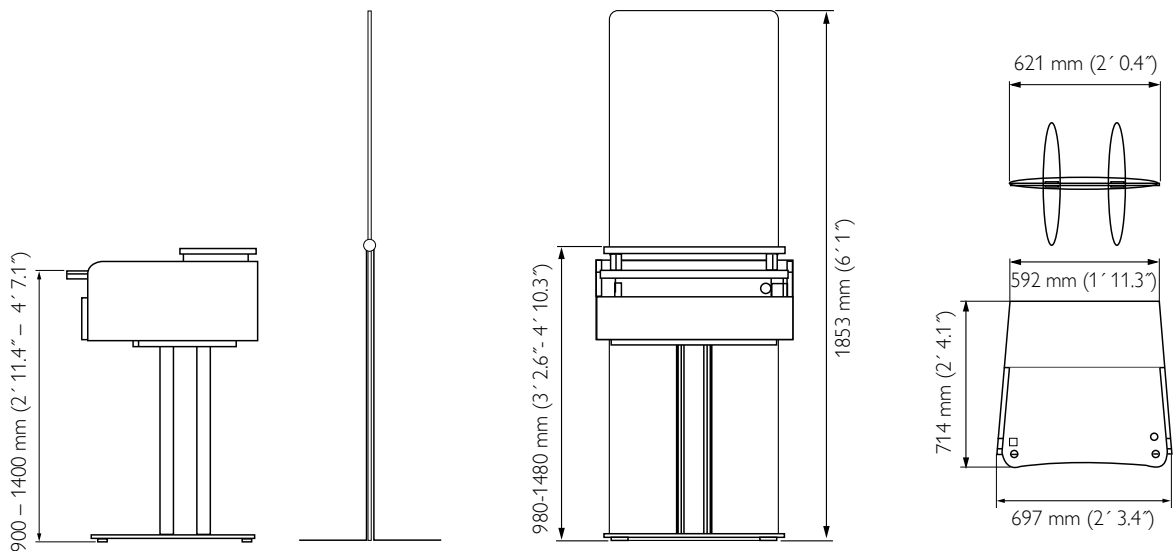
2.3 Side cabinet

Feature
Air cooling system (standard)
Water cooling system (optional)

3. Acquisition workstation

The acquisition workstation provides quality assurance and system control. Gantry movements and exposure settings are controlled from the acquisition workstation. Images are displayed on a flat screen, enabling immediate quality checks. Using standard DICOM protocols,

images are sent automatically to the desired destination, such as a reviewing workstation, for diagnosis. The acquisition workstation is mounted on a height-adjustable work table.



3.1 Acquisition workstation

Feature	Specification
Weight of acquisition workstation table	75 kg (165.35 lbs)
Weight of radiation protection shield	29.5 kg (65.04 lbs)
Radiation protection shield lead equivalent	0.5 mm (0.019") Pb equivalent at 55-120 kVp

3.2 Hardware

Feature	Specification
Computer	PC
CPU	<ul style="list-style-type: none">• HP xw4X00 Workstation: Pentium® 4 / 3.2 GHz (minimum)• HP Z210 Workstation: Intel® Core™ i3 or better
Storage capacity	<ul style="list-style-type: none">• HP xw4X00 Workstation: Up to 2500 (breast) images• HP Z210 Workstation: Up to 6000 (breast) images
Display	LCD 1280 x 1024 or 2048 X 1536 pixels
Keyboard	Yes
Mouse	Yes
Dedicated shortcut keypad	Yes

3.3 Software

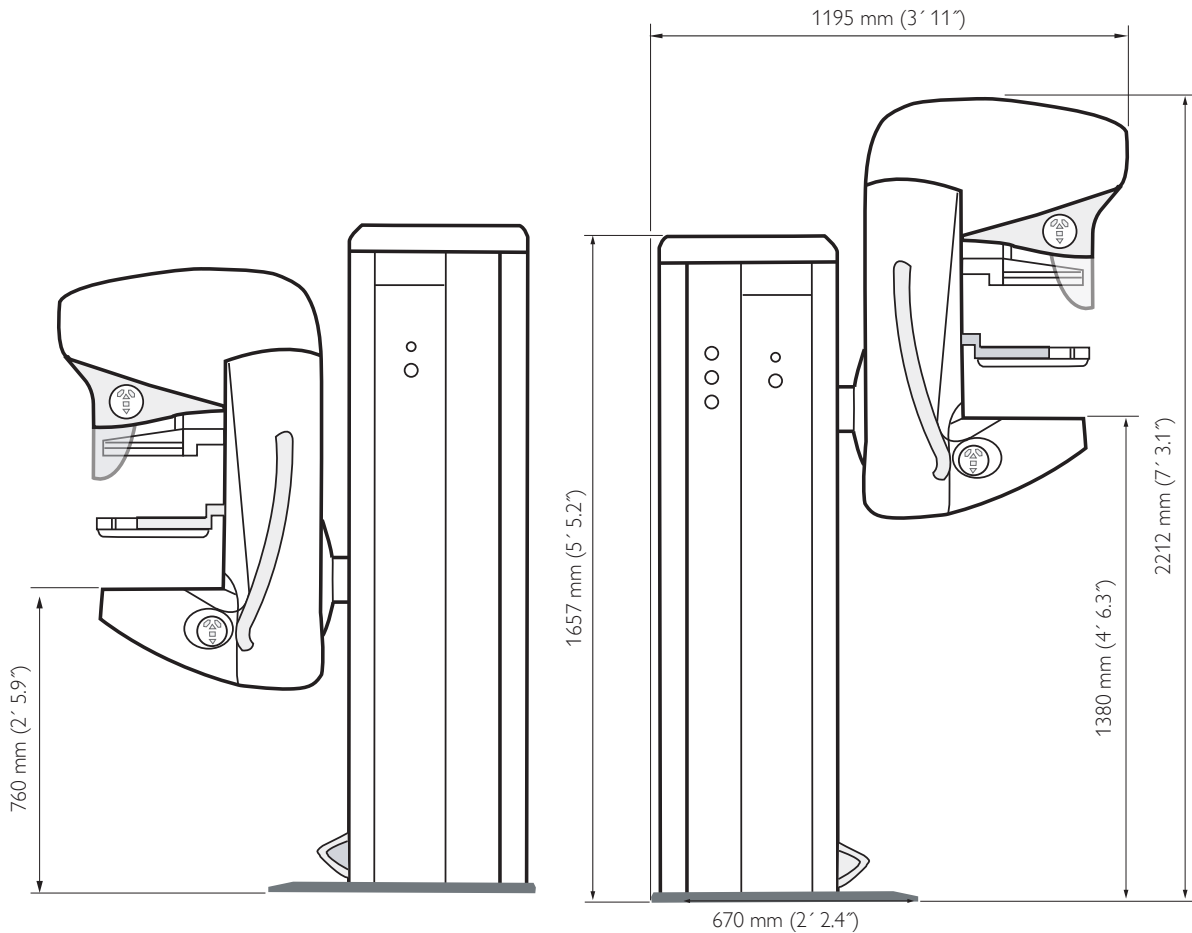
Feature	Specification
Operating system	Microsoft® Windows® XP Professional
DICOM Compliance	<ul style="list-style-type: none"> • Verification as SCU (Service Class User) • Basic Grayscale Print Management Meta as SCU (not supported in connection alternative 5) • Modality Performed Procedure Step (MPPS) as SCU (not supported in connection alternative 5) • Digital Mammography Image Storage – For Presentation as SCU • Digital Mammography Image Storage – For Processing as SCU • Digital X-ray Image Storage – For Presentation as SCU • Digital X-ray Image Storage – For Processing as SCU • Modality Worklist as SCU • Storage Commitment Push Model SOP Class as SCU (not supported in connection alternative 5)
Time to display on AW	< 20 seconds
Parameters visible in the digital image shown on the Acquisition Workstation	<p>Always shown parameters:</p> <ul style="list-style-type: none"> • Side • Projection • Image setting (e.g., “Implant”) <p>Other parameters are optional, but the parameters shown by default for standard breast images are:</p> <ul style="list-style-type: none"> • Patient name • Patient ID-number • kV and mAs • Patient dose (organ dose) • Compression height • Image time (exposure)

4. Mammography stand

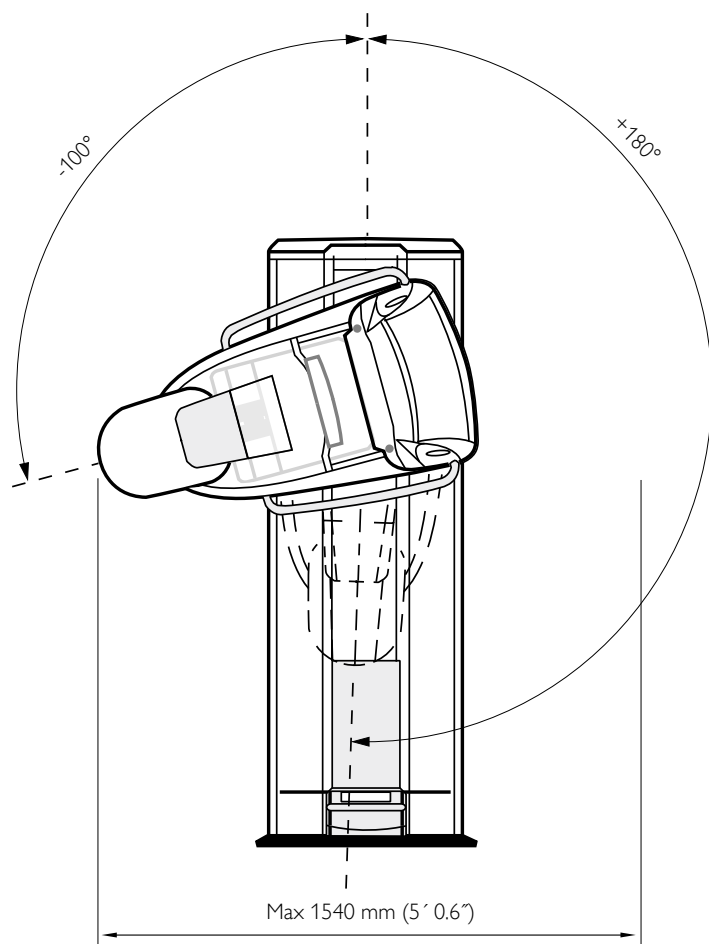
The mammography stand comprises a compact supporting column and gantry. The gantry movements are fully motorized. Auto-positioning functionality can be controlled from the acquisition workstation. The open design of the gantry means patients may be examined standing or seated, as required. The high-voltage generator is dimensioned for intensive patient throughput. The SmartAEC functionality automatically adjusts exposure parameters for individual breasts. This provides high-image quality at a low radiation dose.¹

- Positioning light that automatically switches on when foot pedal is activated
- Five programmable stops for individual projection settings (e.g., 0° , $\pm 60^\circ$, $\pm 90^\circ$)
- Automatic mirroring of projection angles
- Display of compression force, compression height, and projection angle
- Fine adjustment of height and projection angle via ergonomically located buttons
- Two foot pedals for compression
- Configurable first limit for compression force

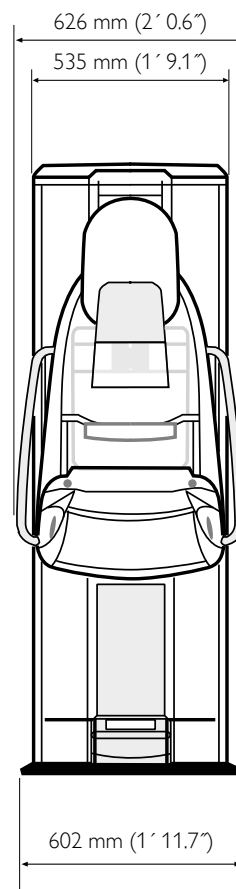
Philips MicroDose utilizes an X-ray tube with a tungsten (W) anode.



4.1 The mammography stand, viewed with the full-motion range of the tube head



4.2 The mammography stand, viewed from the front



4.3 Mammography stand

Feature	Specification
Rotation – standard configuration	-100° to +180°
Height adjustment	760 mm – 1380 mm (2' 5.9" – 4' 6.3") from floor to patient support
SID (Source Image Distance)	660 mm (2' 2")
Compression force	0 – 200 N
Power supply	190/200/208/220/230/240/380/400/415/460/480 VAC ±10%, 60 Hz Requires installation of a power stabilizer. See separate technical specifications for the power stabilizers: <ul style="list-style-type: none">– Tech. spec. Power stabilizer 208 V AC – 1019409– Tech. spec. Power stabilizer 400 V AC – 1019408– Tech. spec. Power stabilizer 480 V AC – 1019410
Effect	12.85 kVA max (2.5 kVA standby)
Over current protection device	40 A slow
Heat dissipation	0.7 kW max (normal duty cycle) 0.4 kW (stand-by mode)
Weight of mammography stand	260 kg (573.2 lbs.)
FDA classification	Class II, 510(k)
ETL certification	• UL 60601-1, First edition, 2003 • CAN/CSA-C22.2 No. 601.1 – M90
Electrical safety	Class 1 - type B (according to IEC 60601-1 §5)
Operating conditions (non-condensing humidity 30 - 75 %)	+10° C – +30° C (+50°F – +86°F)

4.4 High-voltage generator

Feature	Specification
Output	9 kW
kV range	20 – 40 kV The system is typically calibrated for only 5 different kVp values.
Ripple	Maximum 1%
mAs range	0 - 4000 mAs

4.5 Automatic Exposure Control

Feature	Specification
Automatic Exposure Control	SmartAEC exposure mode continuously adjusts the exposure during the image scan, based on feedback from the detector.

4.6 Scanning technology

Feature	Specification
Scan time	4 – 16.5 seconds
Reduction of scattered radiation	-97% ²

4.7 X-ray tube

Feature	Specification
Maximum tube voltage	40 kVp
Focal spot size	0.3 mm (0.012") according to IEC 60336
Anode load (maximum)	6.8 kW (at 38 kVp, 180 mA)
Anode disc size	ø 102 mm (4.0")
Anode material	W (tungsten)
Anode angle	16°
Anode heat capacity	445 kJ (600 kHU)
Heat dissipation	1.5 kW (121.5 kHU/min)
Cooling	Oil-to-air exchanger (fan)
Filter	0.46 mm (0.018") Al equivalent @ 30 kVp, W anode (including 0.06 mm (0.002") filtration in the collimator cradle)
Inherent filter	0.76 mm (0.03") Be

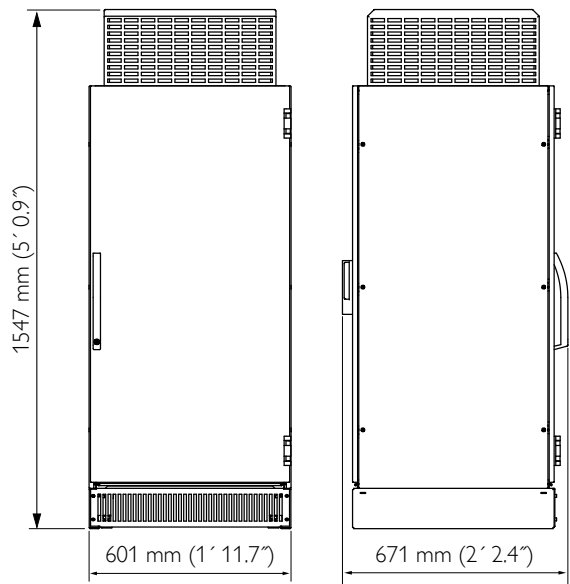
4.8 Detector

Feature	Specification
Detector technology	Photon counting
Field Of View (FOV)	24 x 26 cm (9.4" X 10.2")
Resolution (in pixels)	25 megapixels
Pixel size	50 µm
Image size (amount of data)	50 Mb (uncompressed, standard configuration)
Dynamic range	15 bits
Detector material	Crystalline silicon

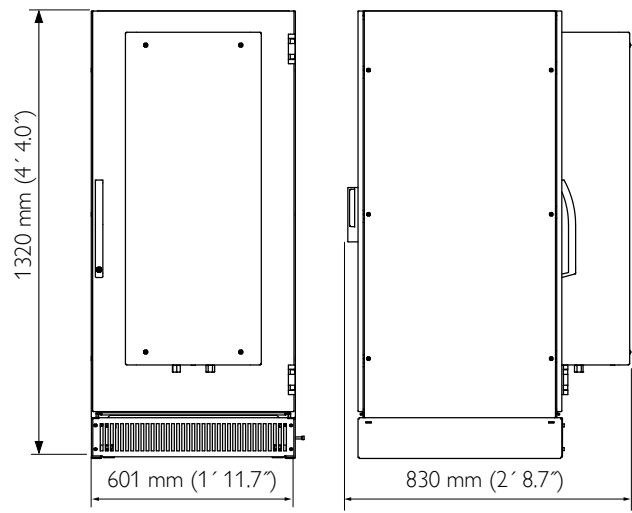
5. Side cabinet

The side cabinet contains the cooling system and electronics. Either air cooling or water cooling of the electrical cabinet is available. When air cooling is used, air conditioning removes the heat.

5.1 Air-cooling (standard)



5.2 Water-cooling (optional)



5.3 Side cabinet

Feature	Specification
Weight with air cooling (standard configuration)	295 kg (650.36 lbs)
Weight with water cooling (optional configuration)	295 kg (650.36 lbs)
Heat dissipation, Side cabinet	2.5 kW (maximum work flow) 1.5 kW (stand-by mode)
Side cabinet cooling options	Air / Water

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Reference

1. Åslund, M. et al., 2005. AEC for scanning digital mammography based on variation of scan speed. *Medical Physics*, 32(11), pp. 3367-74.
2. Åslund, M. et al., 2006. Scatter rejection in multislit digital mammography. *Medical Physics*, 33(4), pp. 933-40.

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Please visit www.philips.com/microdose



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