



Philips DigitalDiagnost C90
Digital radiography system;
High performance room



712034

Site preparation specifications GENERIC

Project reference DigitalDiagnost C90 High Performance VS

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Important information

Important!

This package provides only indicative information intended for use in very early project phases to provide an impression of room set ups and required site preparation. Any information, figure or value shown is not necessarily applicable, accurate and/or up-to-date. Your Philips contact can arrange Room Designs and Site preparation specifications for your specific situation.

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1 General

1.1 Purpose

The Site preparation specifications should provide all required information to the customer and relevant contractors to enable the site to be prepared to the necessary quality and timescales ready for delivery and installation of the equipment.

1.2 Roles

Within this document the following groups are referred to:

- **Philips:** Equipment manufacturer, equipment supplier
- **Customer:** Purchaser, end user
- **Contractor / Third party:** member of the Architect, Engineers & Contractors (AEC) community, hired by either the customer or Philips

1.3 Conditions of use

The information within this document and any included drawings is provided solely for the purpose of providing the customer and/or their architects/building contractors, or the Philips appointed building contractor, with information concerning the Philips equipment locations and associated details, e.g. fixing positions, cable duct routes etc.

This document and any included drawings are not for architectural or building construction purposes other than stated above.

The enabling works detailed in this manual is solely for the installation of Philips supplied equipment, any additional requirements by the customer must be clearly identified and notified to Philips Healthcare and are the responsibility of the customer.

Philips assumes no liability nor offers any warranty for the fitness or adequacy of the premises or the utilities available at the premises in which the equipment is to be installed, used, or stored.

All work described must be carried out in compliance with specifications indicated in this package provided by Philips Healthcare; any deviation must first be agreed by Philips Healthcare project manager.

The specifications laid out in this document can be subject to change by Philips. All parties must ensure they are using the latest version.

1.4 Responsibilities

The customer is responsible for any classification of the room in relation to its intended use, and must notify Philips Healthcare project manager and the contractors of any additional specifications this may include.

The customer remains responsible for all works that are necessary for site preparation, unless works that are included in the Philips contract, in which case the term "customer" can be read as "Philips contractor".

The customer should ensure that the work areas are lockable with limited access. Philips Healthcare should have access to the areas (via keys / access codes) prior to the start and during the installation.

The customer shall advise Philips of conditions at or near the site which could adversely affect the carrying out of the installation work and shall ensure that such conditions are corrected and that the site is fully prepared and available to Philips before the installation work is due to begin.

The contractor and or architect must ensure that the works carried out in line with this document comply with local regulations unless more strict requirements are set out by this document or defined by the customer.

1.5 Site readiness

We expect the site of the installation to be completely finished, clean, dry, and clear of contractors and meet the requirements defined in this document before the equipment delivery / start of the installation. Failure to meet these requirements could result in delays to the timelines, additional charges etc.

1.6 Health & Safety

1.6.1 Radiation considerations for ionizing radiation (X-ray, gamma ray)

The equipment specified in this document uses ionizing radiation (e.g. X-ray, gamma ray) for diagnostic imaging, therefore safety measures have to be applied to avoid hazards to patients, visitors and staff. It is the customer's responsibility to comply with local regulation and to ensure:

- The size, position, angle of vision and radiation protection capabilities of protective shielding & the effectiveness of other radiation protection, radiation warning devices, and further equipment is approved by the local radiation protection authority.
- The required radiation protection is in place at the start of the installation as test images have to be made during the installation.
- That there is sufficient protection from any other existing external sources of ionizing radiation for the Philips employees and representatives during the installation process.
- When drilling holes in protective screen, walls, floor and ceiling it must be ensured that the radiation integrity of the room is maintained.

Equipment data to support the protection calculations by the local radiation protection authority are listed in section *Environmental protection* of this document.



Note!

Equivalents for lead (1 mm Pb)

There are other materials which can be used for protection as an alternative to lead (however this must be specified by the local radiation protection authority)

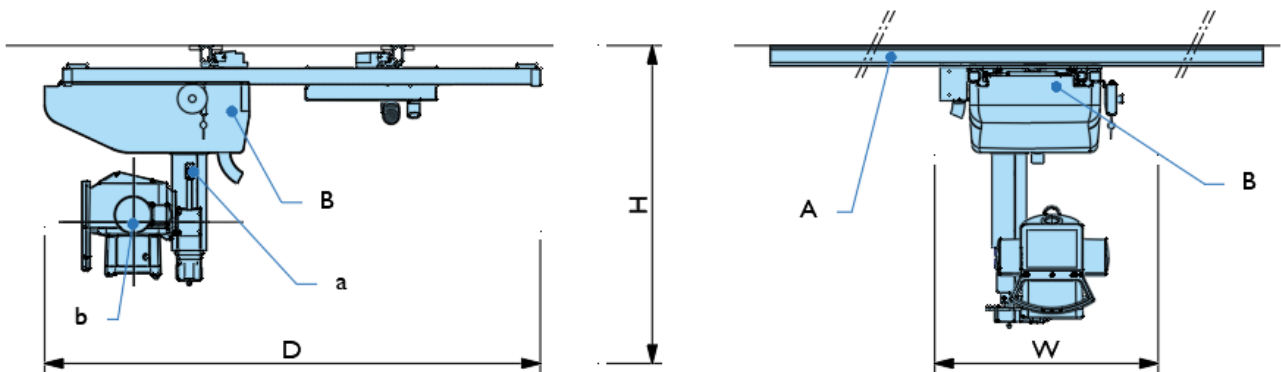
- 8 cm concrete: 2.2 g/cm³
- 11 cm brick: 1.6 g/cm³

1.7 Equipment details

1.7.1 Equipment and delivery specifications

The table lists the basic specifications for the ordered equipment.

Rails and longitudinal carriage (CSM3 long - Comfort Track)

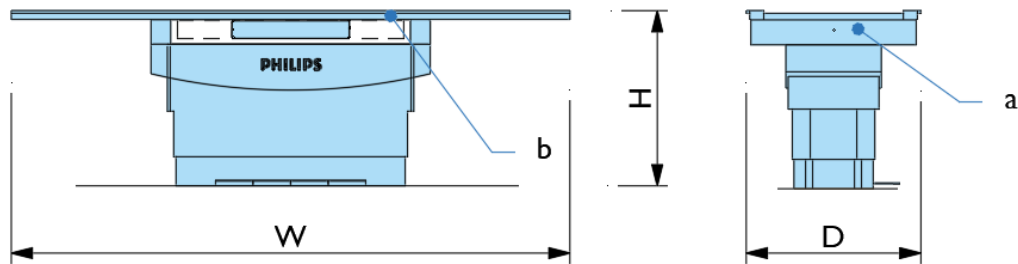


	Width (W) [mm]	Depth (D) [mm]	Height (H) [mm]	Weight [kg]	Notes
Base rails (A)					
Packed	4780	200	140	85	
Installed	4300 (per rail)	96 (per rail)	100 (per rail)	77 (Pair!)	
Longitudinal carriage long (B)					
Packed	4180	770	410	180	Long version
Packed	1200	780	1400	300	Telescopic carriage (a) incl. tube assembly (b)
Installed	918	4076	1514 (min) 3171 (max)	314	

Note

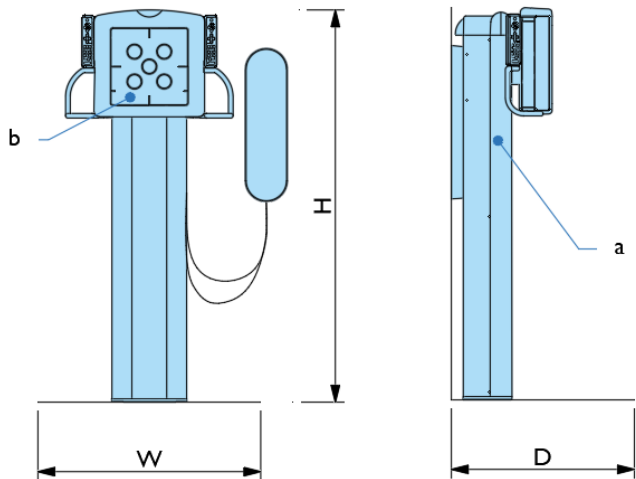
The specified measures are maximum values - they can slightly deviate.
The packaging department reserves the right to change the contents of the packing units respectively.

Patient table DiDi TH2 750 (BU3)



	Width (W) [mm]	Depth (D) [mm]	Height (H) [mm]	Weight [kg]	Notes
Table base (a)					
Packed	1400	1010	890	310	Wooden coverage
Packed	1350	960	830	250	Foil coverage
Table top (b)					
Packed	2500	890	240	82	750 mm
Installed	2400	750	915	250	Assembled table base and table top

Vertical stand VS2 (BU3)



	Width (W) [mm]	Depth (D) [mm]	Height (H) [mm]	Weight [kg]	Notes
Packed	2220	760	550	170	Column (a)
Packed	1030	970	600	90	Bucky unit (b)
Installed	596	543	2085	220	Stand (a+b)

Note

The specified measures are maximum values - they can slightly deviate.
The packaging department reserves the right to change the contents of the packing units respectively.

Other equipment

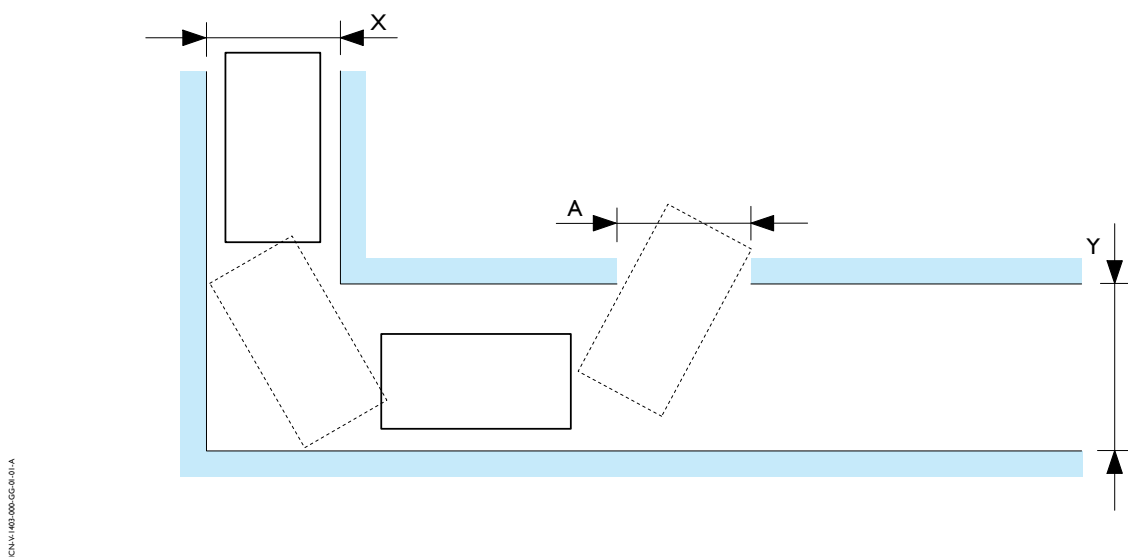
	Width (W) [mm]	Depth (D) [mm]	Height (H) [mm]	Weight [kg]	Notes
Generator (M-cabinet CXA)					
Packed	631	843	1274	130	Generator
Packed	495	140	1000	34	Wall box
Installed	702	488	980	100	Generator
Installed	488	135	1900	20	Wall box
Operator's console					
Packed	580	310	580	10,4	Eleva Touch Monitor
Packed	465	555	358	16,0	Eleva AWS-2X
Installed	492	234	433	17,0	Eleva Touch Monitor
Installed	200	450	336	14,0	Eleva AWS-2X

Delivery details

The delivery routes will be checked in advance by the Philips Healthcare project manager.

The table lists the critical requirements for delivery. In case of any potential problems with these requirements please contact Philips Healthcare project manager.

Requirement	Specification
Site accessibility	Large truck, forklift and in special cases a crane.
Minimum door height	≥ 1700 mm (excl. protective floor covering)
Minimum door width	≥ 970 mm
Minimum corridor width (including 100mm margin for wall mounted obstacles)	≥ 1070 mm
Corridor widths (X&Y) at a 90° bend (see illustration)	$Y \geq 2785$ mm when X = minimum door width (Y can be smaller when X is wider)
Minimum elevator cage size (WxDxH)	2750x1050x1500 mm (longest packages via an alternate route)
Elevator & floor loading	The equipment delivery route must be suitable to take the load and delivery of the packages and the transport tools (e.g. pallet truck, dolly, etc.)



Transport route / Corridor widths (X & Y) and door opening (A)

1.7.2 Storage conditions

If storage of the equipment at the customer site is required and agreed with the Philips Healthcare project manager, the following critical requirements must be maintained. In case of any potential problems with these requirements please contact the Philips Healthcare project manager.

Requirement	Specification
Temperature	-10 to +55 °C
Humidity	10 - 95%, non-condensing
Vibration	10 - 500 Hz

1.7.3 Equipment noise levels

The table lists the basic specifications for the ordered equipment.

Equipment	Noise level [dB(A)]	
	(operational)	(standby)
Ceiling suspension (CSM3) with long longitudinal carriage	≤ 55	≤ 55
Vertical stand (VS2) wall mounted	≤ 55	≤ 55
X-ray generator (M-cabinet CXA)	< 52 (at 1 m distance 1 m above floor)	-
Acquisition Work Spot (AWS-2X)	≤ 43	-

2 Building

2.1 General information

Please ensure that you read all sections of this document and take care to work with the other contractors on any overlapping activity.

All work described must be carried out in compliance with specifications indicated in this package provided by Philips Healthcare. Any deviations must first be agreed by Philips Healthcare project manager.

All work described in this section is to be executed and supplied by the relevant contractor / party, unless otherwise indicated as Philips Healthcare, or defined in a subsequent document.

The area must be prepared to accept cable ducting as required (Feed-through & troughs).

When drilling holes and Feed-throughs in the walls, floor and ceiling it must be ensured that the structural integrity of the room is maintained.

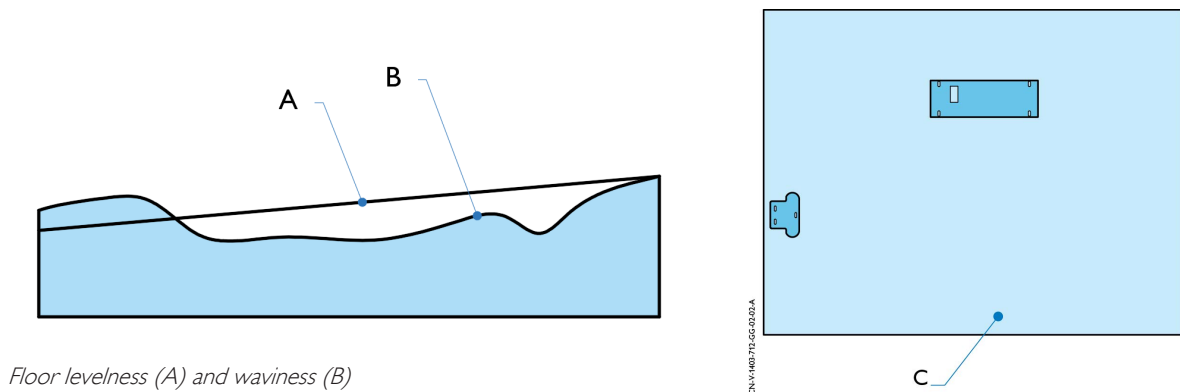
The contractor must ensure that fixing holes, especially tapped holes, are kept clear of any paint / levelling compound etc.

The contractor must ensure that the reference axes, as shown on the drawings, are precisely aligned, and marked on the floor (and ceiling when ceiling provisions are applicable).

2.2 Floor requirements / Floor provisions

Floor levelness and waviness

Floor levelness and waviness are critical for the correct operation of the system and will be checked in advance of the installation.



Floor levelness (A) and waviness (B)

Requirement	Specification
Equipment floor levelness	< 0.5 mm / 1m (measured between any point of the floor area of the equipment) (C)
Floor waviness (B)	Within the tolerances of the floor levelness (A)

Refer to the chapter Drawings, sheet Floor provisions for more information.

The contractor must ensure that the floor mounting / placement areas defined meet the specifications to receive the holes, fixings and take the load.

The mounting points on the floor must be suitable for the tensile strengths and shear forces as indicated in the table below.

There shall be no obstructions on the floor (sliding door tracks, etc.) in front of the Philips technical cabinets. The floor must be clear to allow cabinets to be pulled away from the wall for service.

The customer must ensure that the chosen floor covering is fit for purpose and meets the requirements of any room classifications that may apply.

The contractor must ensure that, if present, any floor ducting should be sealed after the completed installation to prevent the ingress of fluids.

2.2.1 Floor requirements table

Overview of floor mounted equipment and fixation specifications

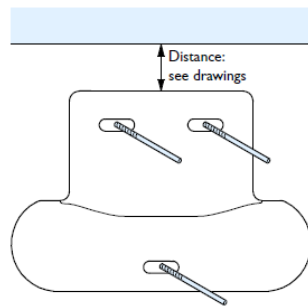
Refer to the chapter *Drawings*, sheet *Floor provisions* for location, quantities and responsibilities

Equipment	Weight [kg]	Fixings	Forces [N]
Patient table (DiDi TH 750mm)	250	4x M12 safety bolts	3600 (each screw)
Vertical stand (VS2) wall mounted	220	3x M12 bolts	500 (each bolt)
X-ray generator (M-cabinet CXA)	100	-	-

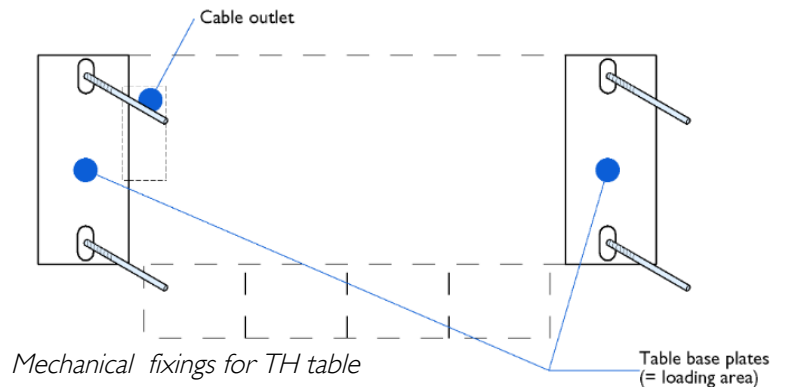
2.2.2 Floor requirements illustrations

Illustration(s)

Refer to the chapter *Drawings*, sheet *Floor provisions* for the site specific drawings.



Mechanical fixings for wall stand (floor)



Mechanical fixings for TH table

Table base plates (= loading area)

2.3 Ceiling requirements / Ceiling provisions

The support structure surface upon which Philips equipment is to be placed / anchored must:

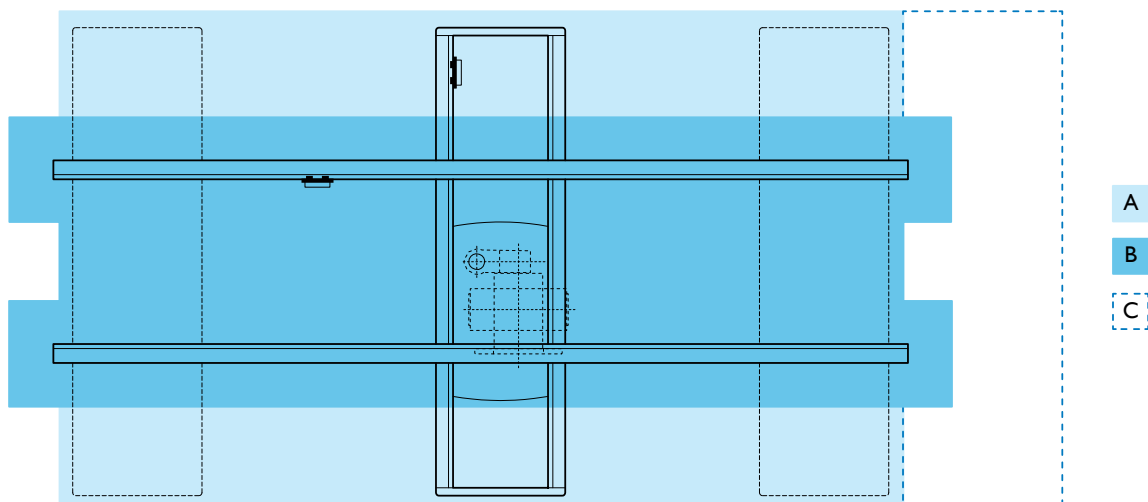
- Be flat and level to within 1 mm
- Square and parallel in each direction (vertical and horizontal) to within 1 mm
- Withstand the forces of retardation in longitudinal and transversal direction up to 0.45 kN, max. to 2.6 kN in longitudinal direction.

Ceiling clearance

Lighting fixtures must be placed in such a position that they are not obscured by equipment or its movement, or interfere with the movement of Philips equipment (e.g. monitor suspensions) or otherwise adversely affect the equipment.

Keep the underside of the finished ceiling clear of objects:

- For an area of 80 mm outside the range of the carriage clear of objects that protrude more than 95 mm below the ceiling (A);
- For an area of 300 mm around the Philips Ceiling Suspension (CS) rails clear of ALL objects (B);
- An area of 900 mm is necessary for insertion of the CS carriage (C).



2.3.1 Ceiling requirements table

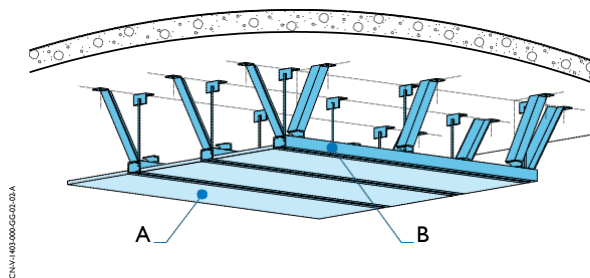
Overview of ceiling mounted equipment and fixation specifications

Refer to the chapter *Drawings*, sheet *Ceiling provisions* for location, quantities and responsibilities.

Equipment	Weight [kg]	Fixings	Forces [N]
Ceiling suspension (CSM3) with long longitudinal carriage	468 (incl. 4300 mm rail)	M10x40 bolts (2 bolts/mounting point)	4250 (each bolt)

2.3.2 Ceiling requirements illustrations

Refer to the chapter *Drawings*, sheet *Ceiling provisions* for the site specific drawings.



Typical example of a false ceiling (A) with ceiling support structure (B)

Description of the support structure

The Philips ceiling rails should be mounted on anchor rails (metal framing). The anchor rails are the interface for installing the ceiling rails. The following anchor rail system(s) are allowed:

- Unistrut, type P1000 / P1001
- MSR-Profile (similar Wieland-anchor rails)
- Graaf-Profile (similar Wieland-anchor rails)

A complete set of fixing material to mount the Philips equipment to the anchor rails (including isolation / installation / insulation plates and shims) is part of the delivery. Further details can be seen in the drawings. If Beam Clamps are used to fix Unistruts/Marstrut to steelwork, a suitable shakeproof type must be used.

The load bearing struts are indicated in the drawings. When applicable extra struts/profiles are indicated to serve as frame work for suspended ceiling tiles.

The contractor must take measures (like tagging) to prevent drilling and/or screwing in the lower metal framing channels.

2.4 Wall requirements / Wall provisions

The contractor must ensure the walls are flat and perpendicular to the floor.

The contractor must ensure that wall mounting areas defined meet the specifications to receive the holes, fixings, and take the load.

2.4.1 Wall requirements table

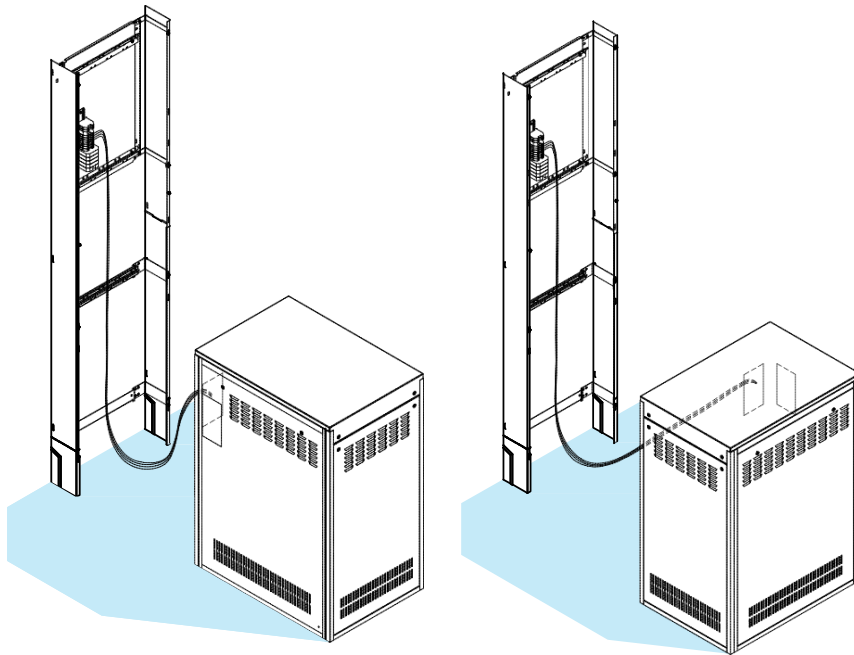
Overview of wall mounted equipment and fixation specifications

Refer to the chapter *Drawings*, sheet *Wall provisions* for location, quantities and responsibilities.

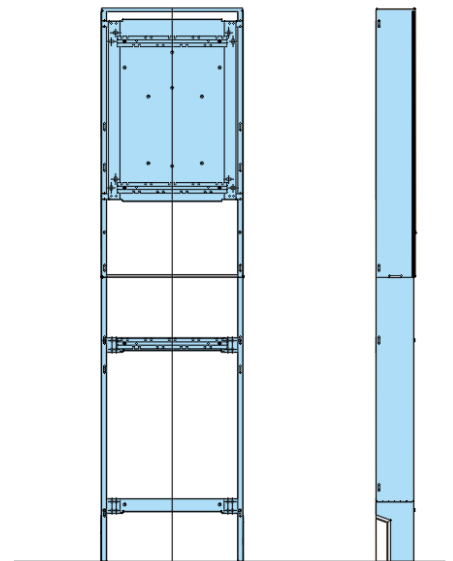
Equipment	Weight [kg]	Fixings	Forces [N]
Vertical stand (VS2) wall mounted	220	2x M12 bolts	1500 (each bolt)
Wall box for x-ray generator (M-cabinet CXA)	20	8x M8 bolts	750

2.4.2 Wall requirements illustrations

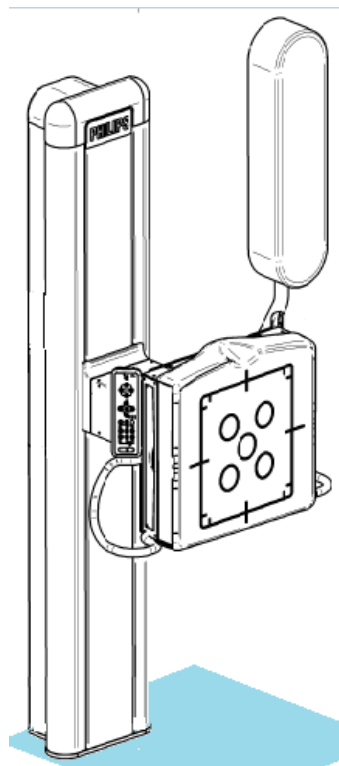
Refer to the chapter *Drawings*, sheet *Wall provisions* for the site specific drawings.



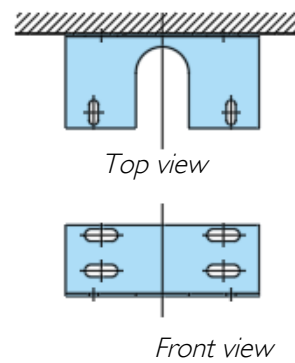
Mechanical fixings for generator cabinet



Mechanical fixings for generator wall box



Mechanical fixings for wall stand (wall)



Mechanical fixings (wall holder) for wall stand VS2

3 Electrical

3.1 General information

Please ensure that you read the other sections of this document and take care to work with the other contractors on any overlapping activity.

All work described must be carried out in compliance with specifications indicated in this package provided by Philips Healthcare; any deviations must first be agreed by Philips Healthcare project manager.

All work described in this section is to be executed and supplied by the relevant contractor / party, unless otherwise indicated as Philips Healthcare, or defined in a subsequent document.

The contractor must ensure that live power is provided as specified to the areas defined and is switchable and tested prior to the start of the installation.

The customer must ensure that the mains supply isolator for the equipment in the room must be conveniently accessible to the contractor.

The cable ducting shown in the drawings should not be used for any cables other than those for the Philips Healthcare equipment.

The contractor must ensure that at least 1200 mm free cable length is left on each unconnected end for all contractor-supplied cabling unless otherwise stated

For specific wiring specifications & instructions (contractor) please refer to the drawings.

3.2 Power

3.2.1 Power specifications

The power specifications are determined by the X-ray generator which generates high voltage for the X-ray tube in the equipment.

3.2.2 Power quality

The power supply to the system must meet the following voltage and frequency requirements.

Requirement	Specification
Voltage	3 × 380/400/480 V +10%
Frequency	49 - 61 Hz

3.2.3 Power consumption

Requirement	Specification
Mains connection	35 kVA
Maximum power	93 kVA / 110 kVA (65kW / 80kW)
Maximum mains current	65 kW: 134 A (at 400 V); 115 A (at 480 V) 80 kW: 160 A (at 400 V); 135 A (at 480 V)
Fuse protection	50 A, slow blow
Mains resistance	65 kW: < 200 mΩ (at 400 V) < 300 mΩ (at 480 V) 80 kW: < 200 mΩ (at 400 V) < 400 mΩ (at 480 V)

3.2.4 Circuit breaker

An earth-leakage circuit breaker is to be provided between the mains fuse and the medical equipment depending on local regulations.

The earth-leakage circuit breaker meets the following specification:

- Rated fault current: 0.03 A
- Rated current: 63 A
- Type of circuit breaker: B all currents sensitive
- Connection terminals for wire cross sections of up to 25 mm²

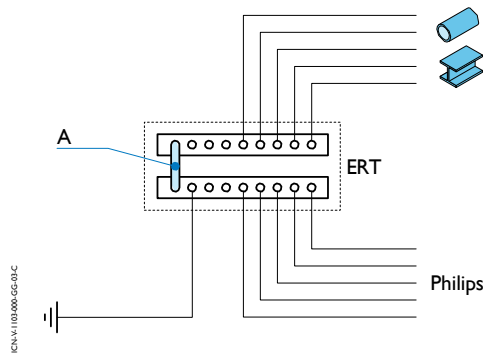
3.2.5 Earthing



Note!

The earth connection requirements for medical equipment exceed those for ordinary electrical installations. The contractor must ensure that local regulations are followed closely.

In all situations, the contractor must ensure that there is one (1!) earth reference terminal (ERT) for all Philips supplied equipment, and it should be connected via a removable link (A) to the customer earth.



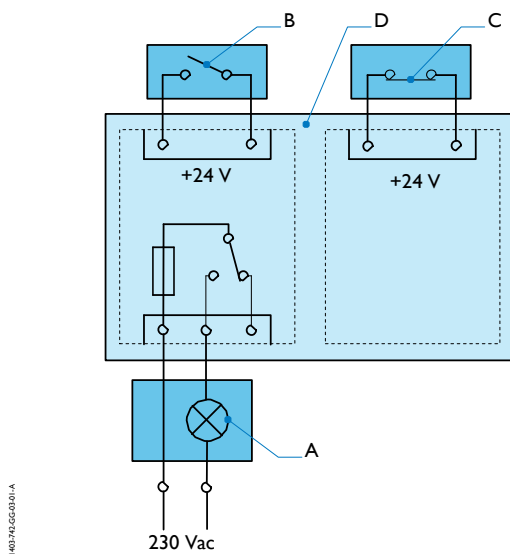
Typical layout of an Earth Reference Terminal

3.2.6 Lighting & Small Power

The contractor must ensure that sockets for the Philips equipment only are provided as per the drawings.

3.2.7 Safety mechanism requirements

The Philips system is equipped with several additional safety provisions. The use of these provisions is regulated by local legislation. Philips Healthcare advises to install the safety provisions at all times to reach maximum safety for personnel and patient.



Typical diagram for safety mechanism requirements

X-ray ON warning lights

For the X-ray on warning light(s) (A), the system is provided with a relay contact in the generator which can switch a maximal 6 A and can be connected to maximum 230 V as shown in the illustration above. The contractor must ensure that the lamp provided has a response time between 1 - 1000 msec.

The contractor must ensure that the X-ray on warning lights are mounted as per the drawings and cables are routed to the X-ray generator. It is allowed to use Philips dedicated cable ducting for this purpose.

The Philips engineer will connect the cables to the X-ray generator (D).

Interlock door contacts

The contractor must ensure that the interlock door contacts (B) are mounted as per the drawings and cables are routed to the X-ray generator. It is allowed to use Philips dedicated cable ducting for this purpose.

The Philips engineer will connect the cables to the X-ray generator (D).

Room emergency off switch

The contractor must ensure that the emergency off switch (C) is mounted as per the drawings and cables are routed to the X-ray generator. It is allowed to use Philips dedicated cable ducting for this purpose.

The Philips engineer will connect the cables to the x-ray generator (D).

Room emergency off switch

The contractor must ensure that the emergency off switch (B) is mounted as per the drawings and cables are routed to the Main cabinet. It is allowed to use Philips dedicated cable ducting for this purpose.

The Philips engineer will connect the cables to the Main cabinet (C).

3.3 Ducting specifications

The contractor must ensure that:

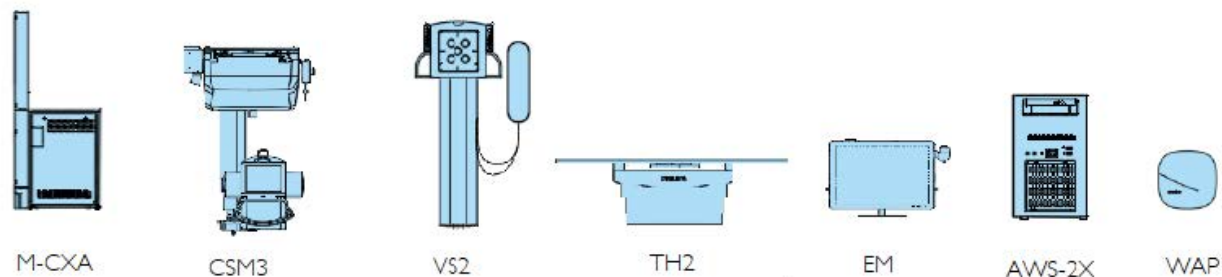
- Cable ducts and trays are routed as per the drawings.
- Upon completion of the Philips installation, all floor trunking must be suitably sealed to prevent ingress fluids.
- All cable outlets are to be fitted with grommet strips to protect against chafing.
- Cable ducts must be reserved for Philips equipment only.
- All metal cable ducts are bonded and earthed according to local regulations.

The contractor must verify the feasibility of the cable routing as shown in the drawings, any changes should be agreed with the Philips Healthcare project manager.

Chosen materials and methods must comply with local regulations and craftsmanship and prevent cable bending radii smaller than 100 mm (unless specified otherwise).

The contractor must ensure that it is possible to access the trunking at any time during the life of the equipment.

Where wiring is indicated point to point on the wiring diagram, it must be run in suitable trunking, cable tray or conduit.



Cable no.	Connection				Cable length [m]
	From		To		
1.	M-CXA	Generator	CSM3	Ceiling suspension	14
2.	M-CXA	Generator	AWS-2X	Acquisition Work Spot-2X	17/27
3.	M-CXA	Generator	EM	Eleva Monitor	17/27
4.	M-CXA	Generator	VS2	Wall stand VS2	17
5.	M-CXA	Generator	TH2	Table TH2	7/17
6.	AWS-2X	Acquisition Work Spot-2X	VS2	Wall stand VS2	30
7.	AWS-2X	Acquisition Work Spot-2X	TH2	Table TH2	30
8.	AWS-2X	Acquisition Work Spot-2X	WAP	WIFI access point Aruba	20

3.4 Networking specifications

3.4.1 Local Area Network (LAN)

The contractor must ensure that the network connection points are supplied, fitted and connected as per the drawings.

The contractor must work with the customer to ensure that a connection to the hospital network is available, prior to the start of installation, at the network connection points as shown in the drawings.

The customer must allocate an IP address and other network specific information requested by Philips, for each network connection shown in the drawings.

Further information and guidance on LAN setup and requirements will be provided by the Philips Healthcare project manager.

3.4.2 Remote Service Network (RSN)

The system needs one or more Ethernet RJ-45 wall sockets with connection to the hospital network as per the drawings. This connection needs to be setup according to the following specifications.

Important!

RSN Details

Please provide the Philips project manager in advance with the details.

- Full duplex network connection, 10BASE-T, 100BASE-T or 1000BASE-T
- Local fixed IP address
- Corresponding subnet mask
- Corresponding gateway
- Minimum required speed: 128 Kbit/s

4 Mechanical

4.1 General information

Please ensure that you read the other sections of this manual and take care to work with the other contractors on any overlapping activity.

All work described must be carried out in compliance with specifications indicated in this package provided by Philips Healthcare; any deviations must first be agreed by Philips Healthcare project manager.

All work described in this section is to be executed and supplied by the relevant contractor / party, unless otherwise indicated as Philips Healthcare, or defined in a subsequent document

4.2 Heating, Ventilation & Air Conditioning (HVAC)

The Philips equipment requires the following temperature and humidity conditions:

Requirement	Specification
Examination room	
Temperature	+18 to +30 °C
Relative humidity	30 - 75% (non-condensing)
Control room	
Temperature	+5 to +35 °C
Relative humidity	20 - 75% (non-condensing)
Technical room	
Temperature	+10 to +40 °C
Relative humidity	30 - 75% (non-condensing)

The following heat outputs of the Philips equipment must be taken into account, please refer to the drawings for the precise locations.

Equipment	Heat output [W]	
	(operational)	(standby)
Ceiling suspension (CSM3) with long longitudinal carriage	400 (incl. tube)	80
Patient table (DiDi TH 750mm)	280 (incl. detector)	150
Vertical stand (VS2) wall mounted	280 (incl. detector)	130
X-ray generator (M-cabinet CXA)	< 100	60
Acquisition Work Spot (AWS-2X)	57 (130 max.)	5
Eleva Touch Monitor	100 (max.)	15

4.3 Liquid cooling

The Philips equipment has no requirements in this discipline.

4.4 Water

The Philips equipment has no requirements in this discipline.

4.5 Sewerage

The Philips equipment has no requirements in this discipline.

4.6 Sprinkler

The Philips equipment has no requirements in this discipline.

4.7 Compressed air

The Philips equipment has no requirements in this discipline.

4.8 Gases

The Philips equipment has no requirements in this discipline.

5 Environmental protection

5.1 X-ray

5.1.1 X-ray energy

The local radiation protection authority can use the following data to determine the correct protection requirements.

Parameter	Specification
Tube current	1000 mA max. (at 80kV)
Tube voltage	150 kV max.
mAs product (without AEC)*	0,4 - 850 mAs
mAs product (with AEC)*	0,5 - 600 mAs
Exposure time	1 ms - 4 s
Exposure frequency	-
*AEC: Automatic Exposure Control	-

6 Drawings

6.1 Site specific drawings

The technical drawings created for this project are added behind this page as a set.

The set normally contains the following drawings (*can vary depending on building works and system configuration*):

- Site layout
- Building modifications
- Schematic cross section(s)
- Floor provisions
- Ceiling provisions
- Wall provisions
- Details

Refer to the table of contents on the cover page of the drawing set for the actual contents.

Important!

Not for construction!

The provided drawings are the graphical part of the site preparation specifications and not intended for direct application as construction drawings. It is the responsibility of the customer or contractor to check the local feasibility of the provided specifications and solutions before embedding them into the actual construction drawings.

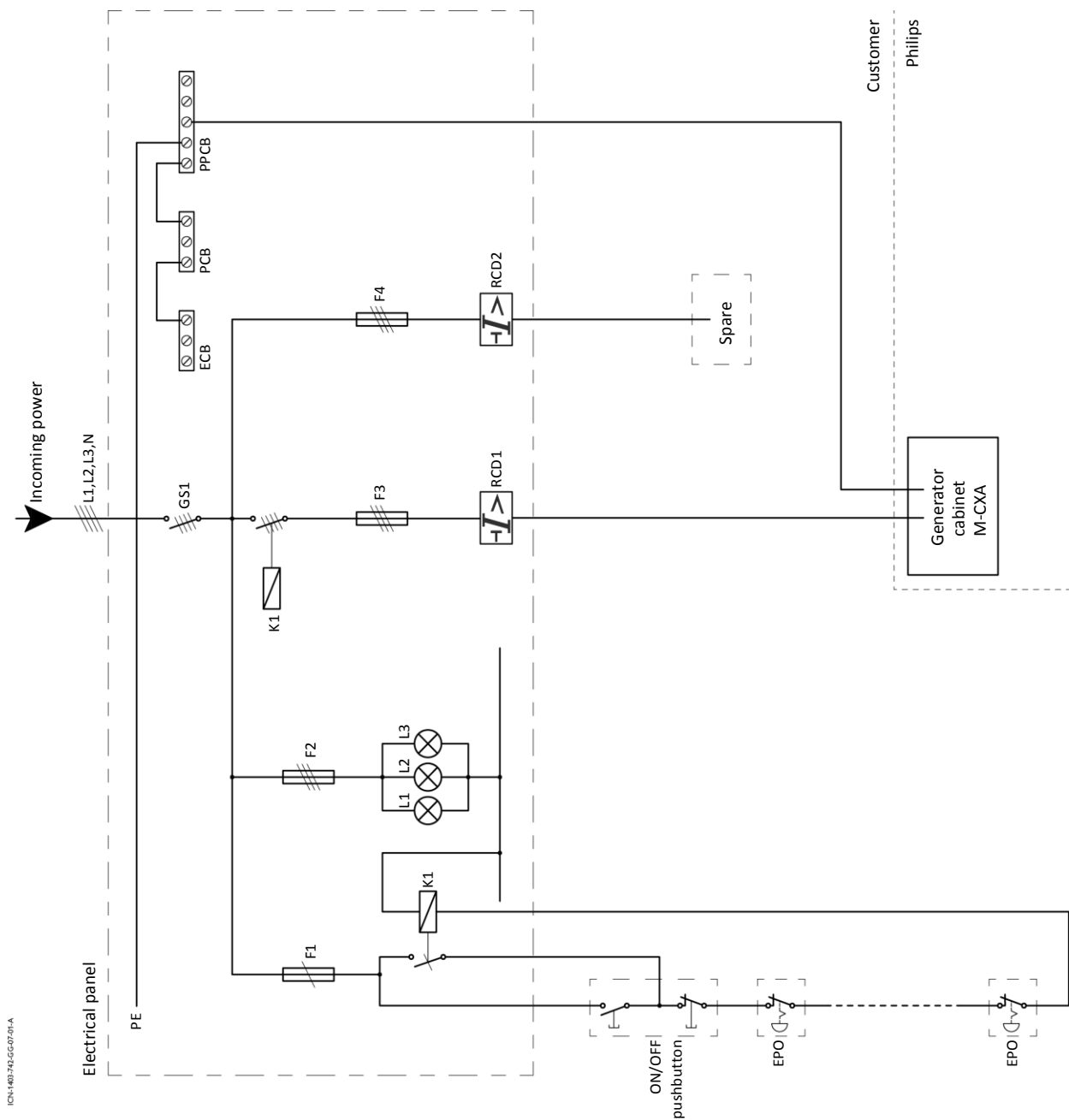
If the customer or contractor decides to use the Philips drawings unchanged, mark each printed or digital copy of each drawing sheet clearly with the following statement:

"Approved for construction by <name of authorized engineer> on behalf of <contractor>"

completed with the date and signature of the authorized engineer.

7 Annex

7.1 Electrical diagram (example)



Requirement		Specification	
Voltage		3x 380/400/480 V ±10%	
Frequency		49 - 61 Hz	
Mains switch (GS1)		Site specific according local regulations	
Fuse protection			
F1	F2	F3	F4
6 A	2 A	50 A, slow blow	16 A
Residual current device			
RCD1		RCD2	
63 A / 0.03 A; Type B		16 / 0.03 A	

Colophon

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