

OMNERA[®] 500A

Auto-Positioning Digital Radiographic System

Planning Guide



Technical Publication: 1000-095-073-EN Rev. 1.1

Canon

CANON MEDICAL SYSTEMS USA, INC.

INTENDED USE

The System is a stationary X-ray system intended for obtaining radiographic images of various portions of the human body in a clinical environment.

The System is not intended for mammography.

CAUTION: US Federal Law restricts this device to sale by or on order of a physician.

Reason for change	Chapter/ Pages	Document	Rev	Date
New Release			1.1	2020-09

Contents

1	Introduction	1
1.1	Document information	1
1.1.1	System documentation	1
1.1.2	Stylistic conventions	1
1.1.3	Document producer	1
1.1.4	Copyright © 2020 Arcoma Corporation all rights reserved.	1
1.1.5	Text emphasis	1
1.2	System Description	3
1.2.1	General	3
1.2.2	Intended Use	3
1.2.3	Configuration	3
1.2.4	System Overview	4
2	Environment Specification	5
2.1	Modification of equipment	5
2.2	Placement of non-medical components	6
2.2.1	Image system computer	6
2.3	Installation Site Conditions	7
2.4	Room and installation specification	8
2.4.1	Wall clearance	8
2.4.2	Ceiling Height	8
2.4.3	Ceiling / Floor / Wall Specification	8
2.4.4	Ceiling specification	9
2.5	Floor specification	11
2.6	Wall specification	13
2.7	Electrical building installation	14
2.7.1	Electrical Characteristics	14
2.7.2	Power ratings and line requirements	15
2.7.3	Cable duct specification	16
3	Room Layout	17
3.1	Installation proposal	17
3.1.1	Reference	17
3.1.2	Room layout 1	18
3.1.3	Room layout 2	19
3.1.4	Room layout 3	20
3.1.5	Focus Coverage	21
3.2	System connections	22
3.2.1	Cables, Layout left	22
3.2.2	Cables, Layout right	23
4	Component Specification	25
4.1	Overhead Tube Crane, overview	25
4.1.1	General Specification	26
4.1.2	Movements	27
4.1.3	Vertical Movement Range	28
4.1.4	Alpha/Beta Movements	29
4.1.5	Cable Outlet	30
4.2	Table	31
4.2.1	Table overview	31
4.2.2	General Specification	32
4.3	Wall stand	33
4.3.1	Wall stand Overview	33
4.3.2	General Specification	34
4.3.3	Movements	35

Contents

4.4	System cabinet	36
5	Technical specification	37
5.1	Electrical Characteristics	37
5.2	Environmental Requirements	38
5.3	Ceiling suspended X-ray tube support	39
5.3.1	<i>General</i>	39
5.3.2	<i>Configuration</i>	39
5.3.3	<i>Weight</i>	39
5.3.4	<i>Electrical Characteristics</i>	39
5.3.5	<i>Classification</i>	39
5.3.6	<i>Speed</i>	40
5.4	Cabinet	41
5.4.1	<i>Dimensions</i>	41
5.4.2	<i>Weight</i>	41
5.5	Table	42
5.5.1	<i>Column</i>	42
5.5.2	<i>Table Top</i>	42
5.5.3	<i>Weight</i>	42
5.5.4	<i>Electrical Characteristics</i>	42
5.5.5	<i>Attenuation Equivalent</i>	42
5.6	Wall stand	43
5.6.1	<i>Attenuation equivalent</i>	43
5.6.2	<i>Weight</i>	43
5.6.3	<i>Speed</i>	43
6	Energy consumption	45
7	Transport Specification	47
7.1	Crates	47

1 Introduction

1.1 Document information

- It is important to keep this document for the life of the equipment, and pass the document on to any subsequent holder or user of the equipment.
- The original version of this manual is written in English.
- Training is provided by or via Arcoma. Training material consists of the Operation manual and the Installation and service manual.

1.1.1 System documentation

The following documentation is available for the system:

- Installation and service manual
- Operation manual
- Planning guide

1.1.2 Stylistic conventions

All warning label texts are shown in *italic* style in this manual.

All references are shown in *italic* style in this manual.

1.1.3 Document producer

This document has been produced by:

Arcoma AB
Annavägen 1
S-352 46 VÄXJÖ,
Sweden

www.arcoma.se

1.1.4 Copyright © 2020 Arcoma Corporation all rights reserved

The reproduction, transmission or use of this document or its content is not permitted without express written authority. Offered will be liable for damages. All rights, including rights created by patent grant or registration of a utility model or design, are reserved.

1.1.5 Text emphasis



WARNING!

All texts labelled with “WARNING” call attention to potential risk to health or life.

CAUTION!

All texts labelled with “CAUTION” contain information about dangerous situations and measures to avoid risk.

Introduction

Document information

Note!

All texts labelled with “NOTE” contain additional information regarding the work step, and is provided for a better understanding or as a warning about unnecessary and avoidable difficulties.

1.2 System Description

1.2.1 General

Arcoma Precision includes:

- Overhead tube crane (OTC) with x-ray tube and collimator
- Table
- Wall stand
- System cabinet with a high voltage generator
- Image Acquisition system
- Flat panel detectors

1.2.2 Intended Use

The system is a stationary X-ray system intended for obtaining radiographic images of various portions of the human body in a clinical environment.

The system is not intended for mammography.

1.2.3 Configuration

The basic system consists of system Cabinet (including generator), Image acquisition system, Flat panel detectors, and Overhead tube crane. The basic system can be equipped with one of the following three configurations:

- Table and Wall Stand
- Wall Stand
- Table

Introduction

System Description

1.2.4 System Overview

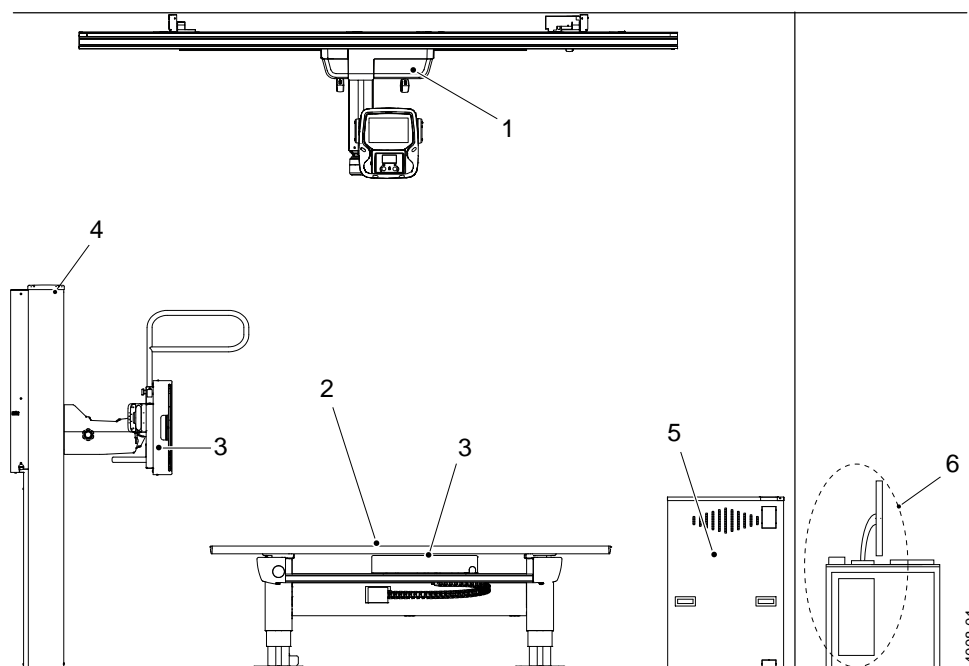


Fig. 1-1 System Overview

1. Overhead tube crane, OTC
2. Table
3. Detector holder
4. Wall stand
5. System cabinet
6. Computer and monitor

2 Environment Specification

2.1 Modification of equipment



WARNING!

No modification of this equipment is allowed.

Environment Specification

Placement of non-medical components

2.2 Placement of non-medical components

Non-medical components may not be placed inside the patient environment according to regulations (IEC 60601-1).

The standard defines a sphere of 1.5 m around the patient as the patient environment.

The Ceiling support can be operated across the entire rail grid, i.e. the 1.5 m boundary must be placed outside the rail grid. Also take into account the patient entries and exits and the possibility for the patient to walk around in the examination room. In practice, this means that no non-medical components can be placed inside the walls of the examination room.

There is a possibility of using an indicator lamp, alerting when an examination is going on.

2.2.1 Image system computer

Image system computer used and other similar devices are normally non-medical components. The image system computer and the including touch-screen used in Precision i5 is no exception and may therefore not be placed inside the examination room.

2.3 Installation Site Conditions

Avoid the following installation sites:

- Places where the temperature changes drastically.
- Places near heat sources such as heaters.
- Places where water leakage or machine submersion may occur.
- Places where corrosive gas may be generated.
- Dusty places.
- Places where the system is subject to constant or excessive vibration or shock.
- Places exposed to direct sunlight.
- Places where no ventilation equipment is provided.

Environment Specification

Room and installation specification

2.4 Room and installation specification



WARNING!

It is strongly recommended to mount and use a permanent, lockable switch to turn off and lock the System power. This is necessary when working with the installation and the maintenance of the System.

2.4.1 Wall clearance

According to regulations (IEC 60601-1), a minimum distance of 500 mm between moving parts and surrounding walls and or permanently installed objects, must be considered when planning the room layout.

The clearance requirement does not apply to the Wall stand, since it is manually operated.

The table top movement can be limited to allow a smaller room size or if objects are placed within the 500 mm zone. The stroke is adjustable via mechanical end stops, placed on each side of the table top.

2.4.2 Ceiling Height

The 0072 Subsys shall be installed in a room with a ceiling height between 2900 mm and 3100 mm for full functionality.

Prepare substructure to fulfil those conditions

2.4.3 Ceiling / Floor / Wall Specification

The performance of the System is highly depending on the pre-installation work that has to be done on the ceiling, the floor and the wall.

The Manufacturer does not take responsibility of the ceiling, floor or wall construction. The Manufacturer recommends the ceiling, floor and wall to be levelled 1mm/m.

Local regulations and specifications must be observed.

The specifications specified in this section, do not apply for earthquake risk regions. For more information and specifications regarding risk assessments and calculations, please contact the Manufacturer's sales department.

Local regulations and specifications must also be observed. The forces listed in this document are not always in correspondence with the local and/or national regulations.

2.4.3.1 General Information Included in Shipment

- Expansion bolts for the Table and the Wall stand are included in shipment.
- A drilling template for the Table and a marking template for the Wall stand is included in the shipment.
- Spacers for the Table, Wall stand and ceiling support are included in shipment.
- Insulation kits for all system components are included in shipment.
- Mounting kit for the ceiling rail Y (Unistrut mounting brackets, etc.) is included in the shipment. See Fig. 2-1 *Mounting kit for the ceiling rail Y*

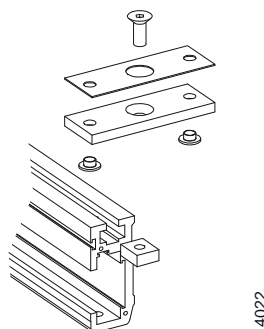


Fig. 2-1 Mounting kit for the ceiling rail Y

Note!

Installation kit can be ordered separately. It includes 3 m Unistrut (5 pcs), Unistrut nuts M10 (20 pcs), mounting bolts M10x30 (20 pcs), cable holder for wall attachment Wall stand (1 pc), cable holder for wall attachment ceiling support (1 pc).

2.4.3.2 General information not included in shipment

- Appropriate sub construction for the ceiling rail Y, e.g. Unistrut, must be provided (not included in shipment).
- Cable runs or similar must be supplied (not included in shipment).
- Screws, bolts, or similar for mounting the cable outlet for the OTC must be supplied (not included in shipment).
- Alignment tools, such as rotating lasers or similar, must be supplied (not included in shipment).

2.4.4 Ceiling specification

Check that necessary fixation points are present at the ceiling. Use Unistrut rails or similar mounted with a distance of 800 mm and 2900-3100 mm above the floor.

- The Unistrut rails shall be parallel with the long side of the patient table.
- Vertical alignment shall be within +/- 1 mm.
- Every single attachment point, must be able to carry a load of at least 400 kg.
- The ceiling suspended x-ray tube support with 4x4 m rails, must have at least 10 brackets at the ceiling.
- All attachment points together, must be able to carry at least 2000 kg.
- +/- 1 mm deformation are allowed.

To be able to mount the cable carriage, the distance between the wall and the ceiling rail Y, must be minimum 120 mm.

To be able to push the OTC into the traverse rails, the distance between the wall and the traverse rail X, must be at least 1000 mm. If this distance to the wall is not achievable, the 4 wagon wheels may be dismounted and the wagon lifted up, in between the traverses. Then the wheels may be remounted, while the wagon is held in place.

Environment Specification

Room and installation specification

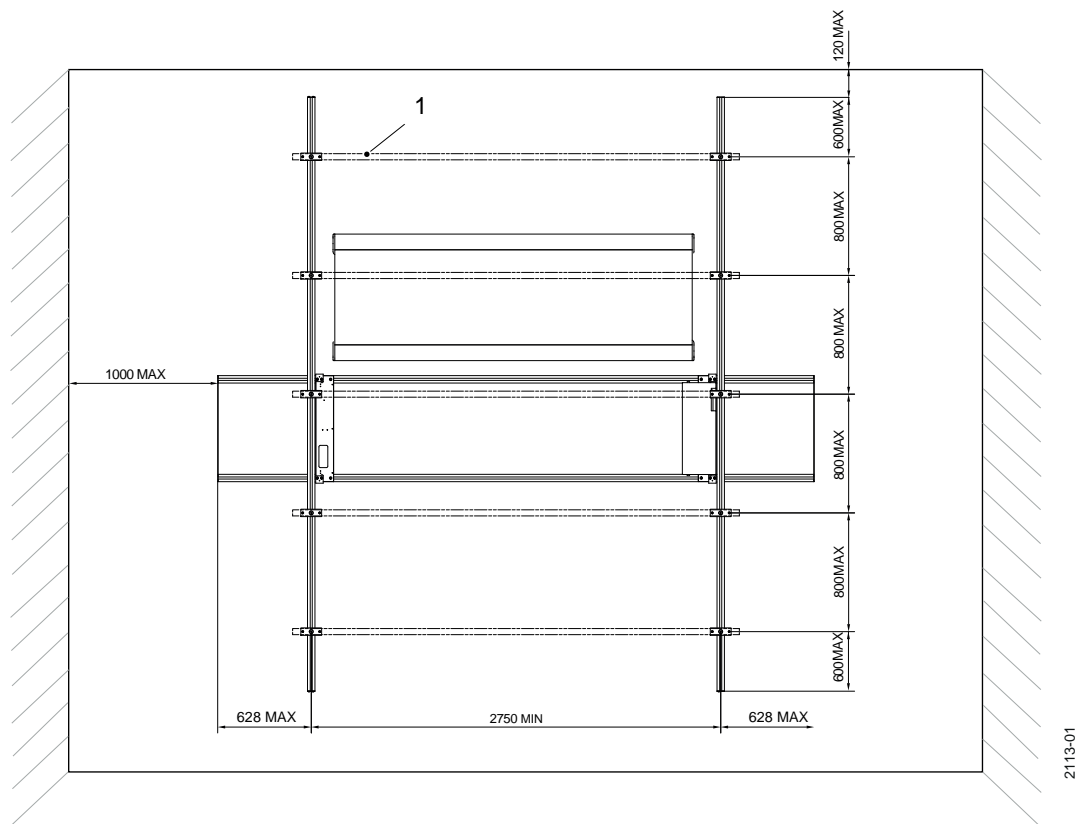


Fig. 2-2 Ceiling specification

1. Unistrut 3 m (included in optional installation kit)

2.5 Floor specification

The Table and the wall stand must be installed on a solid base with sufficient load capacity (not within scope of this document), e.g. concrete.

The floor must be able to withstand the pull forces supplied on the expansion bolts. The pull forces for the components are listed in Table 2-1, see also Fig. 2-3 *Drilling template Table* and Fig. 2-4 *Marking template, wall stand (Isolation plate)*.

The table and the wall stand must be levelled to 1 mm/m.



Fig. 2-3 Drilling template Table

1. Head end

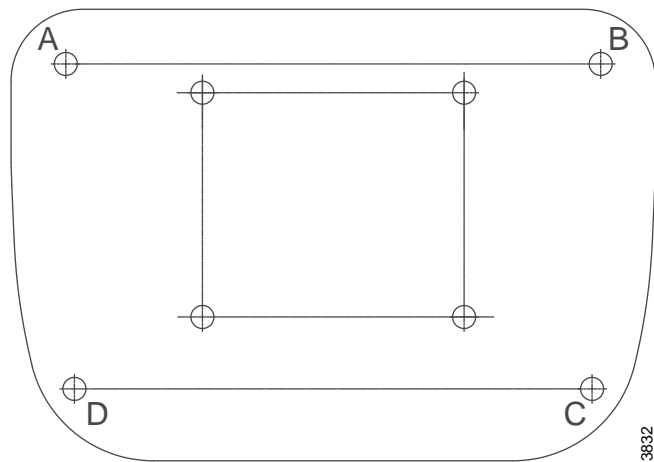


Fig. 2-4 Marking template, wall stand (Isolation plate)

Note!

The isolation plate for the wall stand shall only be used as a marking template and not as a drilling template, due to the large hole size.

Table 2-1

Mounting point	A	B	C	D	E	F
Force table	5 kN	5 kN	5 kN	5 kN	5 kN	5 kN
Force wall stand	5 kN	5 kN	5 kN	5 kN	-	-

M10 expansion bolts are provided for the table and the wall stand.

Environment Specification

Floor specification

The manufacturer specification and the Service and Installation manuals, included at delivery for both components, must be observed.

The cables are usually placed in a cable duct in the floor. If a cable duct is not an option, a cable channel can be used. The dimensions (depth and width) of supposed cable duct, are illustrated in Fig. 2-5 *Cable duct*. The Table cable outlet is placed on the head end Table base and is also included in the Table drilling plate.

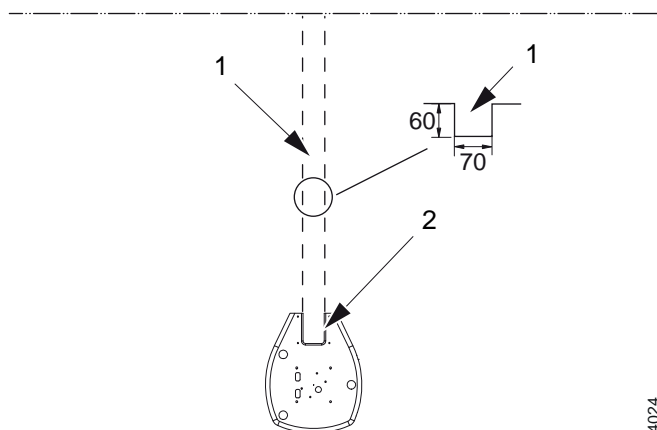


Fig. 2-5 *Cable duct*

4024

2.6 Wall specification

The walls are usually only used for mounting the cable outlets for the ceiling support, the Wall stand and the system cabinet. Therefore, the only specification for the walls is that it must be possible to mount and secure the cable outlets. Screws, bolts, or similar for mounting the cable outlets must be supplied (not included in shipment).

Environment Specification

Electrical building installation

2.7 Electrical building installation

The Machinery directive 2006/42/EC requires the system to be fitted with means to isolate it from all energy sources.



WARNING!

This equipment must only be connected to supply mains with protective earth.



WARNING!

Always turn off the power and lock the main switch before service or maintenance.

Note!

A lockable disconnecting device on the mains, to disconnect the system from mains power, must be installed according to national wiring rules

2.7.1 Electrical Characteristics

Capacity	75kVA (= 480V x 150A)
Overload Protection	Distribution switch board on the site: With the built-in circuit breaker (NFB_150A)
Grounding Method	Connect to the main power supply unit and the cabinet protective ground terminal at the site.

2.7.2 Power ratings and line requirements


The product requires a three-phase electrical line with a protective earth ground (4 or 5 wires).

The transformers in the system cabinet, requires a tap configuration.

The generator has an automatic main line selection (no transformer tap configuration required).

The voltage has to be manually set to:

- 3 Phase VAC $\pm 10\%$
- 400 VAC 50Hz
- 400 VAC with neutral 50 Hz
- Maximum wire gauge 4 AWG (25 mm²)
- Required fuse 63 A B curve thermal breaker, 3-phase, b-curve

Model:	0180
SN	XXXX
	MM/YYYY
Power rating:	
<input type="checkbox"/>	400 3~VAC
<input type="checkbox"/>	400 3~N VAC
<input type="checkbox"/>	480 3~VAC
Long-time (positioning) 2A, 50/60Hz	
Momentary (exposure) 150A, 50/60 Hz	
Intermittent operation: 20% 1min ON / 4min OFF	

3227-01

Fig. 2-6

Environment Specification

Electrical building installation

Generator Series and Mains Voltage	Generator Momentary Line Current	Apparent Mains Resistance	Recommended Minimum			
			Mains Disconnect to Generator (15 ft/5 m max)	Generator Service Rating	Distribution Transformer Rating	Ground Wire Size
50 kW 400 VAC, 3p	100 A	0.17 Ω	13.3 mm ²	100 A	65 kVa	13.3 mm ²
65 kW 400 VAC, 3p	125 A	0.13 Ω			85 kVa	
80 kW 400 VAC, 3p	155 A	0.10 Ω			105 kVa	
50 kW 480 VAC, 3p	80 A	0.24 Ω			65 kVa	
65 kW 480 VAC, 3p	105 A	0.19 Ω			85 kVa	
80 kW 480 VAC, 3p	130A	0.15 Ω			105 kVa	

Recommended service disconnect (as per the above table):

- All wiring and grounding should comply with the national electrical code or equivalent.
- All wiring must be copper.
- The disconnecting switch shall be located within reach of the operator.

2.7.3 Cable duct specification

All cables shall be enclosed in cable channels, cable ducts or conduits according to regulations (IEC 60601-1).

The following notes shall be considered;

- Avoid cross-overs and forming of cable coils.
- Use appropriate dimensions.
- Consider the bending radius of the cables.
- If using conduits, consider that the connectors of the high voltage cables should be able to be pulled through.
- Cable channels or cable ducts shall be used for on-the-floor installations.




3 Room Layout

3.1 Installation proposal

The layout proposals, displayed in the drawings on the next pages, are chosen to optimize the performance of the system with usability, different modes and ergonomics in mind. The chosen layout proposal considers the tube heel-effect, cable conduits, work space etc, as well as safety issues such as wall clearance and possible collision zones. The room appearance (furniture, lights, fire protection devices etc.) is not considered in the layouts.

Implementing the system in a small room limits the moving range of the table top.

3.1.1 Reference

-  Recommended placement of doors
-  Safety zone
-  Alternative placement of components

3.1.2 Room layout 1

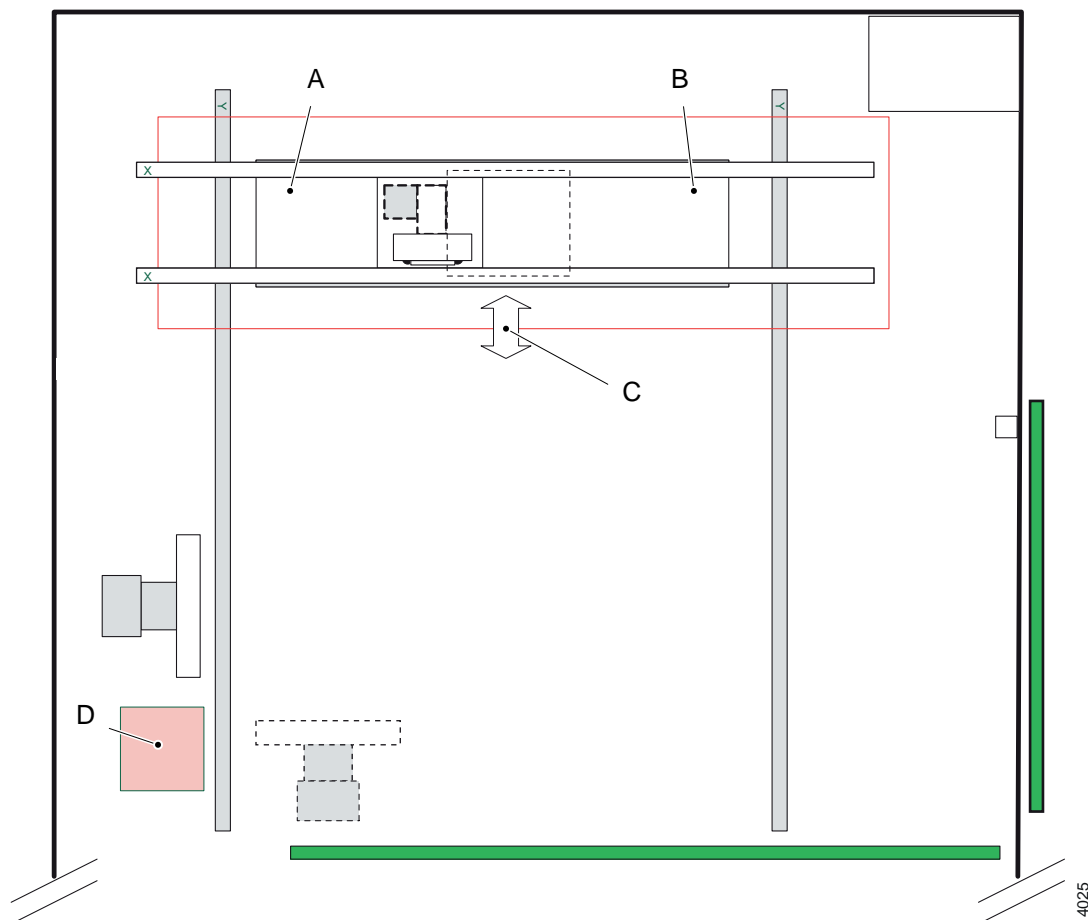


Fig. 3-1 Layout 1

- A Head end
- B Foot end
- C Grid
- D Origin of the coordinate X, Y

Layout 1 is the preferred layout.

The layout enables quick and easy positioning of the system and minimizes the masses that need to be moved. The layout also enables a wide range of examination possibilities due to the large working area.

The placing of the Wall stand on the left-hand side is a result of the Heel effect of the X-ray tube.

3.1.3 Room layout 2

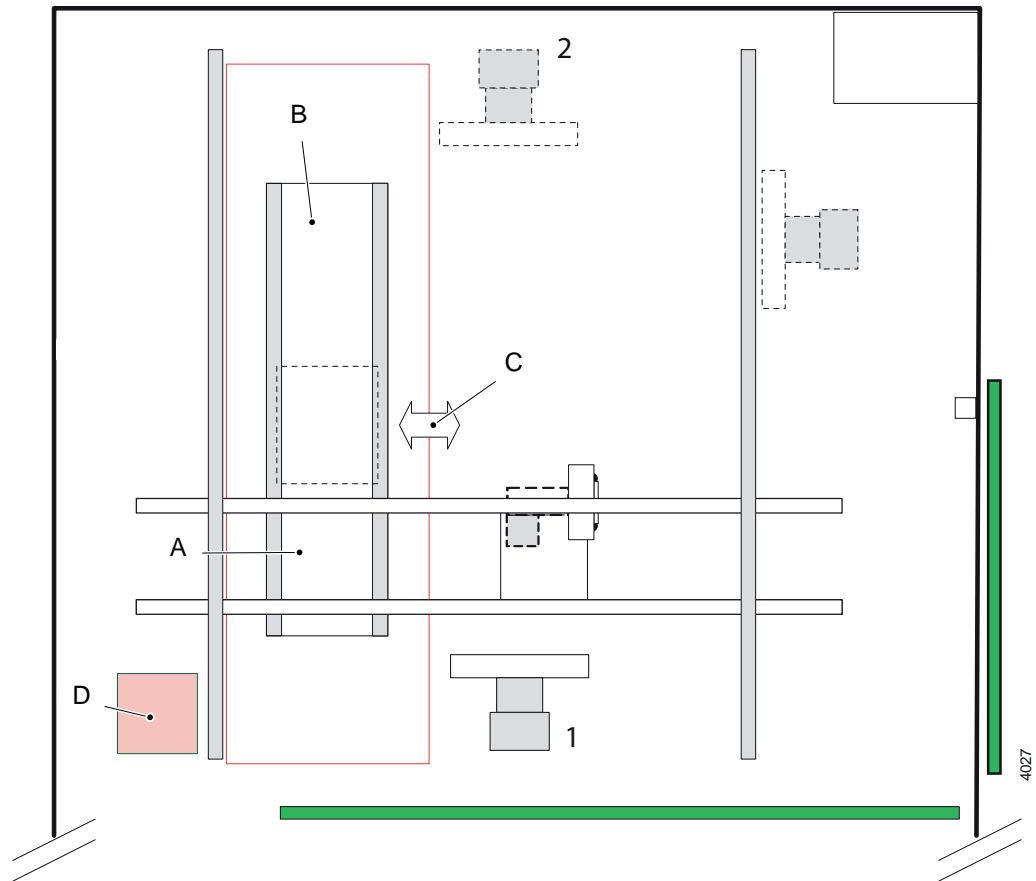


Fig. 3-2 Layout 2

- A Head end
- B Foot end
- C Grid
- D Origin of the coordinate X, Y

This layout is a variation of layout 1.

This option may be considered if the room layout, e.g. placement of doors, does not allow Layout 1 to be chosen. The disadvantage of selecting this layout is the larger room that is required and the extended amount of mass that has to be handled during examinations.

The Wall stand has a bucky/detector holder with loading from the left side, enabling the operator to work from an optimal position at all times. Working with the Wall stand bucky/detector holder tilted, will require additional operations to get the X-ray tube and the detector aligned (rotation of the beta axis) due to the placing of the Wall stand.

The placing of the Wall stand is depending on the heel effect, but the cable routing should be considered. 1 - Cable management, 2 - Heel effect.

A System installed in a room with similar size, and with the component placed as described in Fig. 3-2 Layout 2 does normally require 20 m cable length, which also is the standard configuration.

3.1.4 Room layout 3

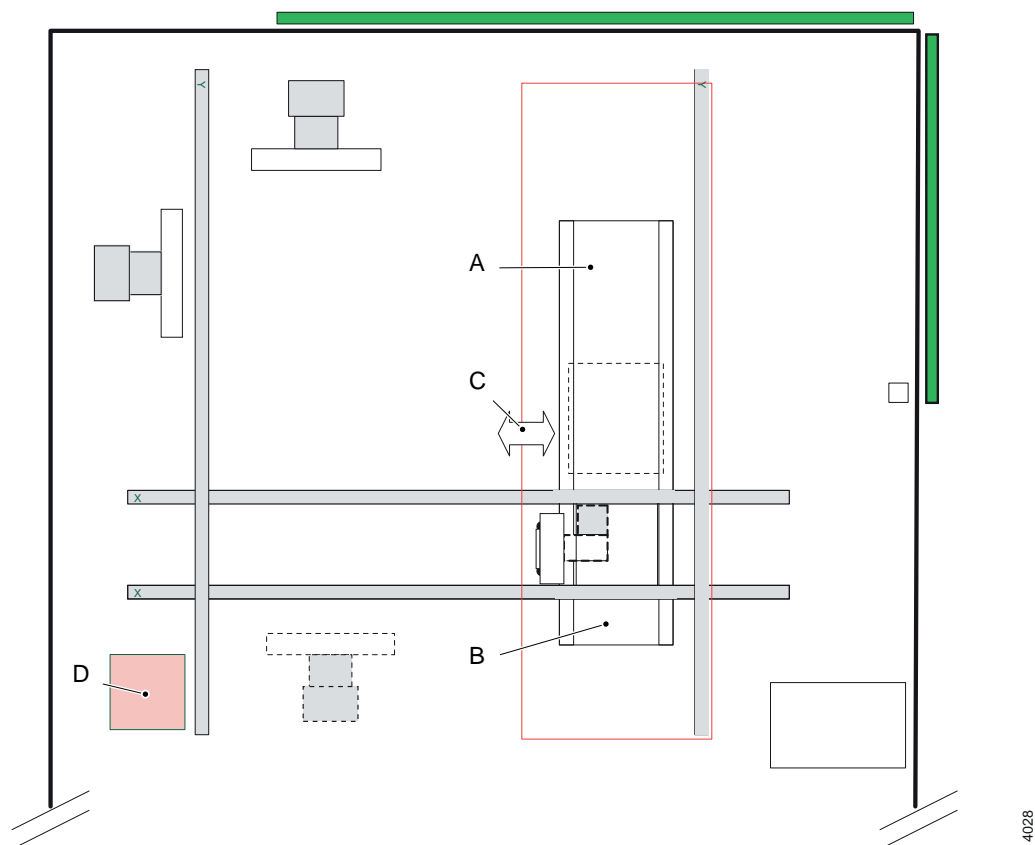


Fig. 3-3 Layout 3

- A Head end
- B Foot end
- C Grid
- D Origin of the coordinate X, Y

3.1.5 Focus Coverage

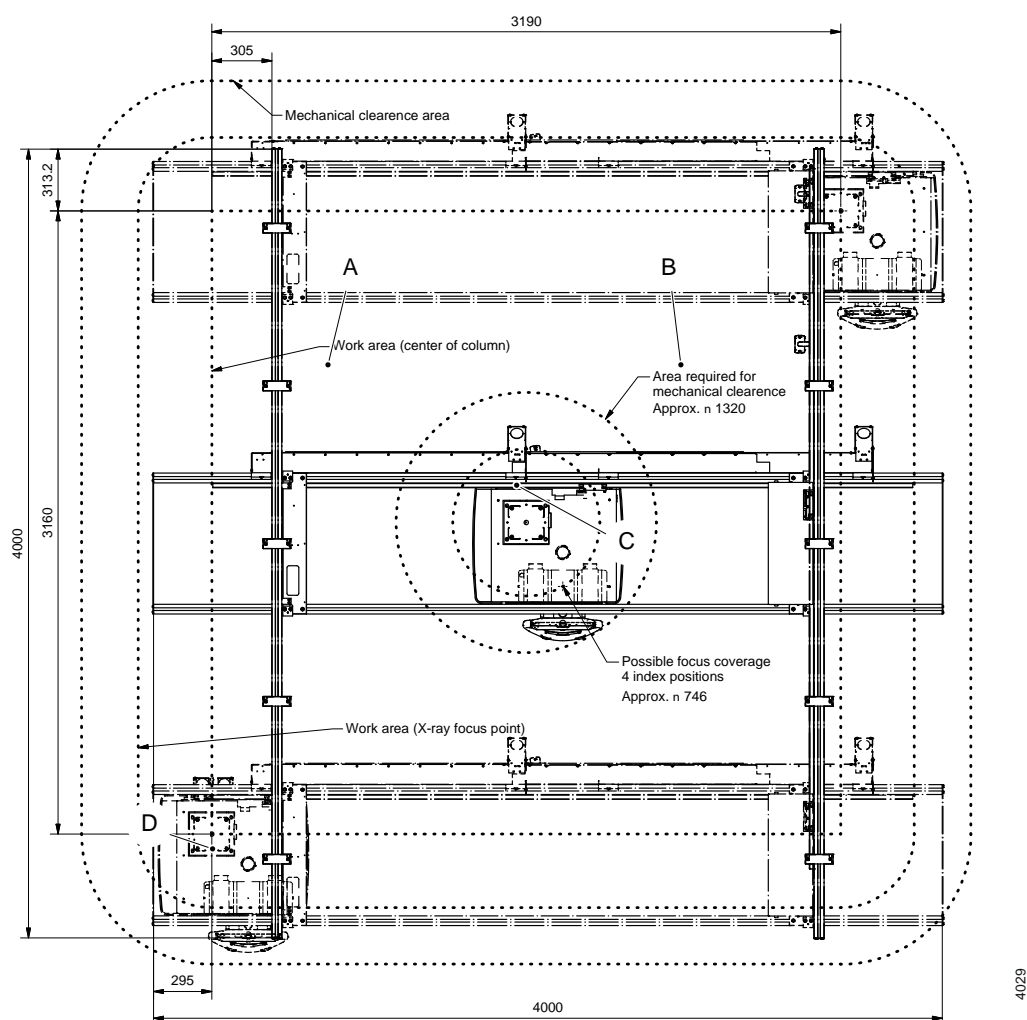


Fig. 3-4 Focus Coverage

SID (Focal Spot to Image Distance)	
Wall stand	
For chest position exposure:	1200 - 2000 mm
For tilted exposure:	1000 - 1300 mm
Table	- 1000 - 1300 mm

Room Layout

System connections

3.2 System connections

3.2.1 Cables, Layout left

The length of the cables from the ceiling suspended unit is 24 m. The length of the cables is measured between the generator and the X-ray tube.

The lengths, displayed in the column “Length from outlet” are excluding the cable length needed inside the System cabinet, i.e. the 24 m configuration has 13 m of cables between the wall attachment cable hose outlet (A) and the System cabinet.

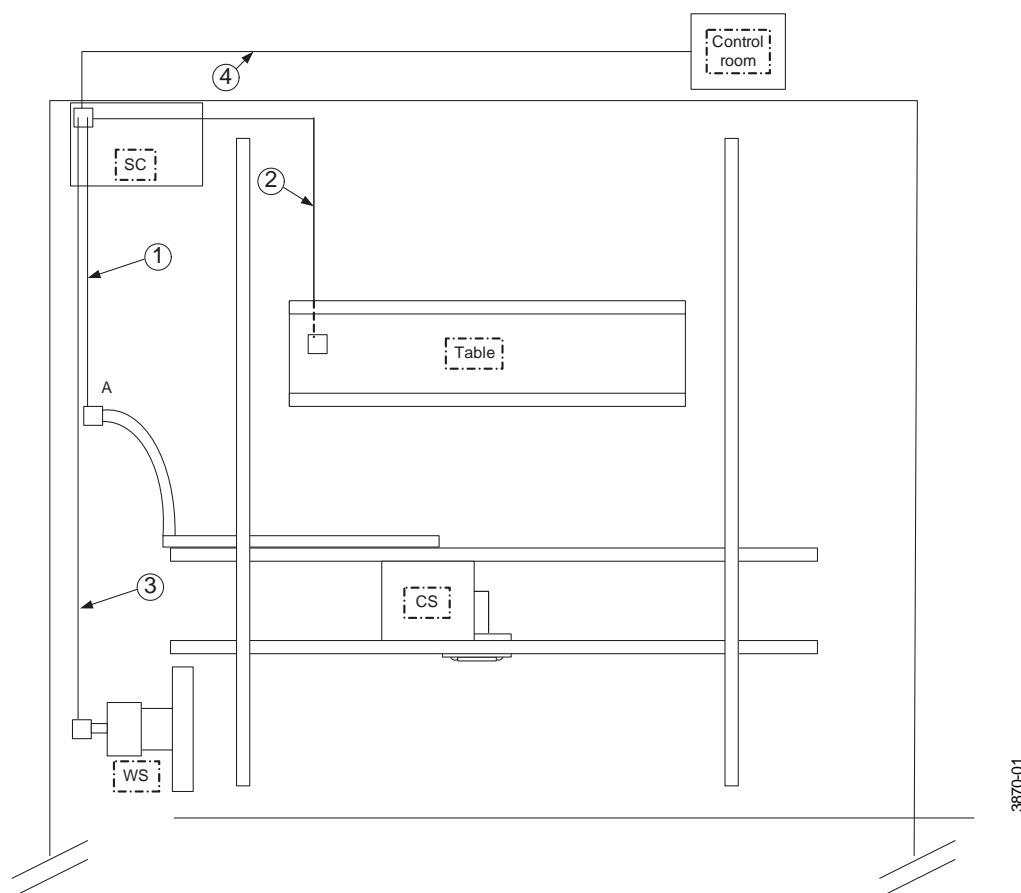


Fig. 3-5

No.	From	To	Cable channel cross section (min)	Conduit, diameter (min)	Length from outlet (max)
1	CS	SC	1320 mm ²	60 mm	13 m (24 m)
2	Table	SC	525 mm ²	70 mm	15 m
3	WS	SC	420 mm ²	70 mm	15 m
4	SC	Control room	81 mm ²	45 mm	21 m

The length of the cables between the outlet and the System cabinet restricts where the System cabinet can be placed.

3.2.2 Cables, Layout right

The length of the cables from the ceiling suspended unit is 24 m. The length of the cables is measured between the generator and the X-ray tube.

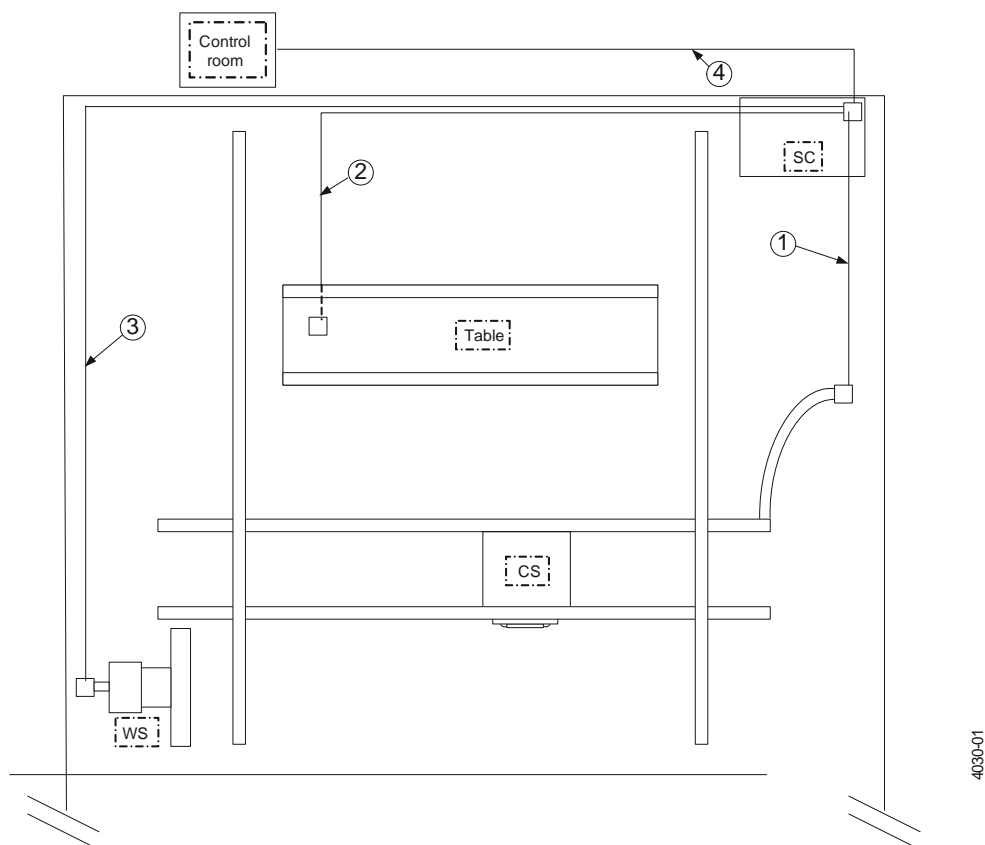


Fig. 3-6

No.	From	To	Cable channel cross section (min)	Conduit, diameter (min)	Length from outlet (max)
1	CS	SC	1600 mm ²	60 mm	10.5 (24 m)
2	Table	SC	900 mm ²	70 mm	15 m
3	WS	SC	625 mm ²	70 mm	15 m
4	SC	Control room	81 mm ²	45 mm	21 m

The length of the cables between the outlet and the System cabinet restricts where the System cabinet can be placed.

Room Layout

System connections

4 Component Specification

4.1 Overhead Tube Crane, overview

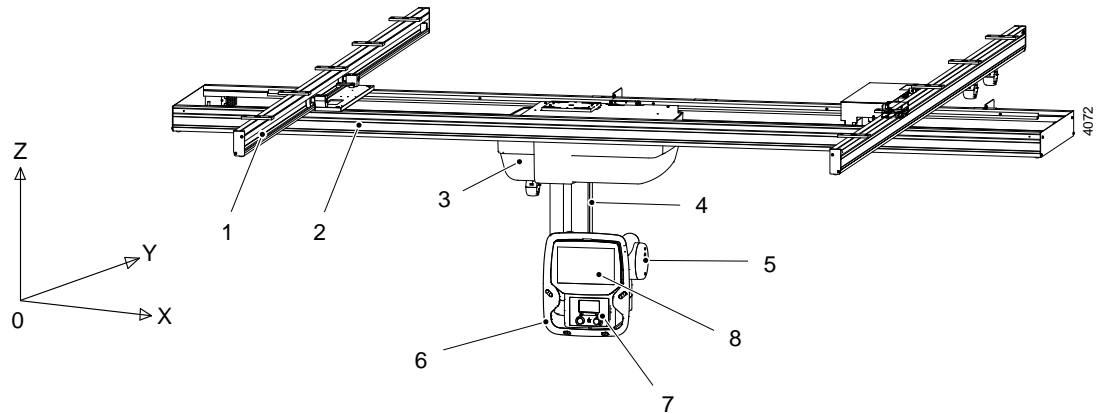


Fig. 4-1 Overhead Tube Crane, OTC

- | | |
|----------------------|---------------------|
| 1. Ceiling rail (Y) | 5. X-ray tube |
| 2. Traverse rail (X) | 6. Manoeuvre handle |
| 3. Ceiling wagon | 7. Collimator |
| 4. Column (Z) | 8. Display |

Component Specification

Overhead Tube Crane, overview

4.1.1 General Specification

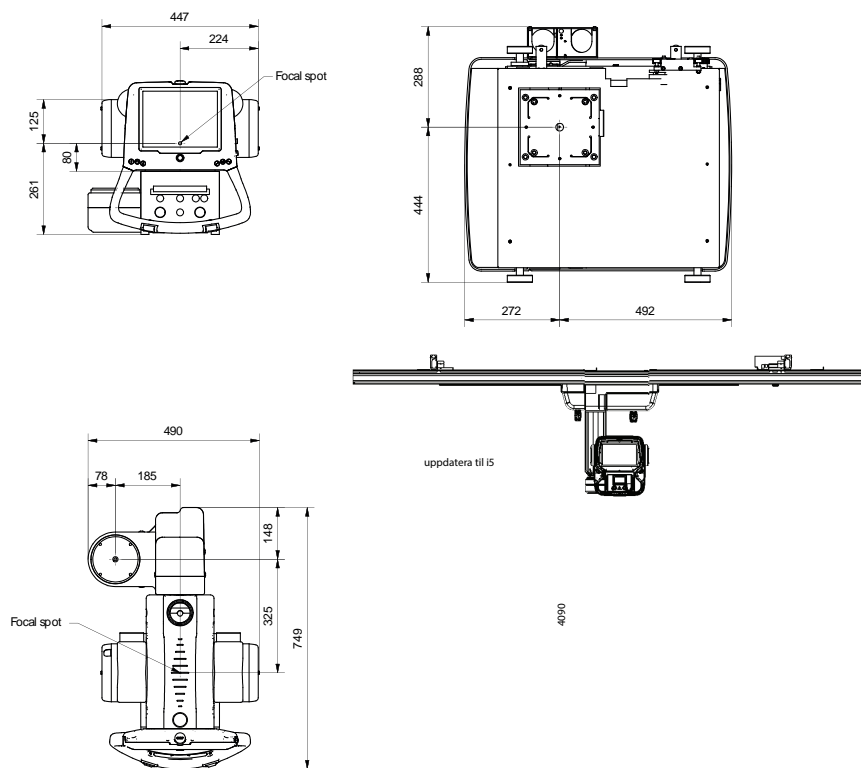


Fig. 4-2 General Specification

4.1.2 Movements

4.1.2.1 Ceiling wagon movements

The manual movements of the ceiling wagon are defined by the dimensions of the ceiling wagon itself and of which rail configuration that is selected. The movement range is also limited by the mechanical end stops that are placed on the ends of each rail.

Motorized movements is a little bit less depending on installation.

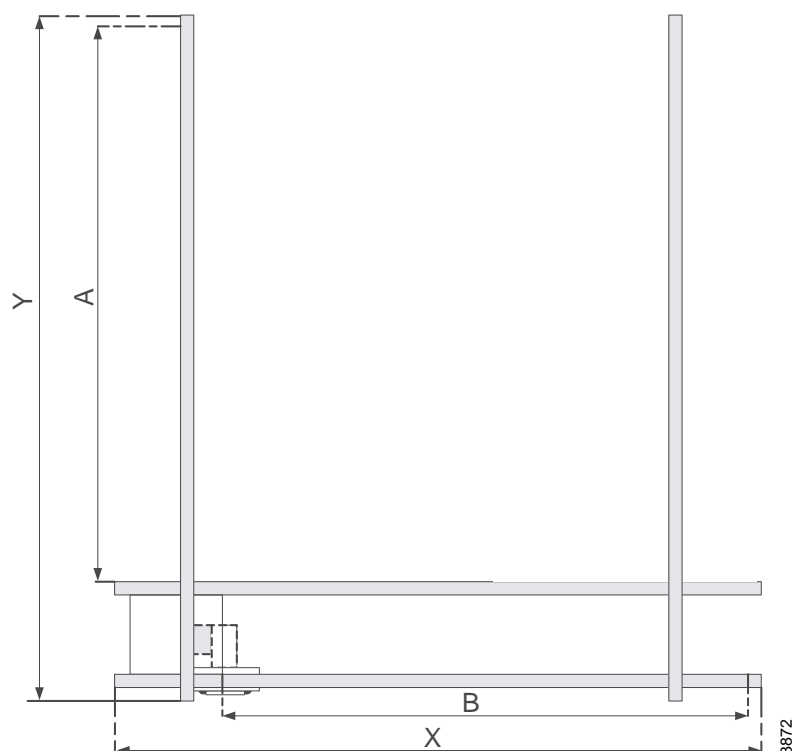


Fig. 4-3

Direction	X-rail (mm)	Y-rail (mm)	Stroke A (mm)	Stroke B (mm)
Standard	4000	4000	3160*	3190
Optional installation	4000	5000	4160*	3190
Optional installation	4000	6000	5160	3190
Optional installation	5000	4000	3160	4190
Optional installation	5000	5000	4160	4190
Optional installation	5000	6000	5160	4190

*Cable carriage reduce.

If cable carriage is used, it will reduce stroke with approximately 105 mm for each wagon

Component Specification

Overhead Tube Crane, overview

4.1.3 Vertical Movement Range

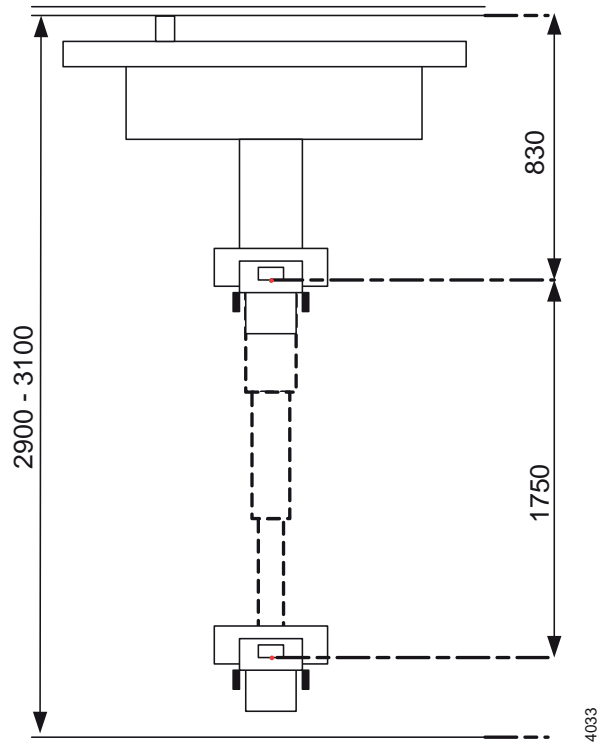


Fig. 4-4 Vertical Movement Range

4.1.4 Alpha/Beta Movements

The Alpha movement has a total stroke of $>270^\circ$, limited by fixed mechanical end stops. The Alpha movement has three mechanical indexes (-90° , 0° , 90°). The current Alpha angle is always shown in the display, placed in front of the x-ray tube.

The Beta movement has a total stroke of $>340^\circ$, limited by a mechanical end stop. The mechanical end stop is adjustable, allowing the system to be configured to suit all possible room layouts. The Beta movement has four mechanical indexes (-180° , -90° , 0° , 90°).

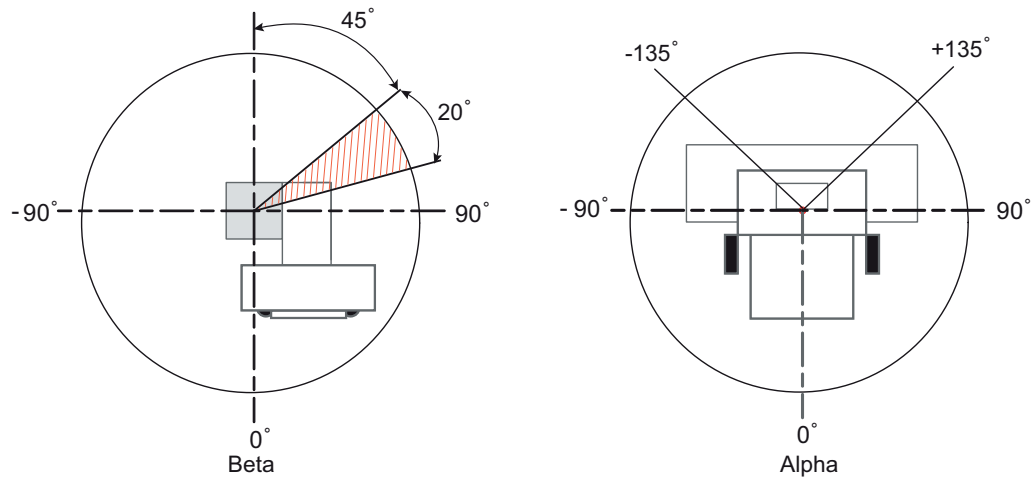


Fig. 4-5 Movement range Beta/Alpha. Factory set-up

4034

Component Specification

Overhead Tube Crane, overview

4.1.5 Cable Outlet

4.1.5.1 Placement

The placing of the ceiling suspended unit, shall be optimized for a good wiring.

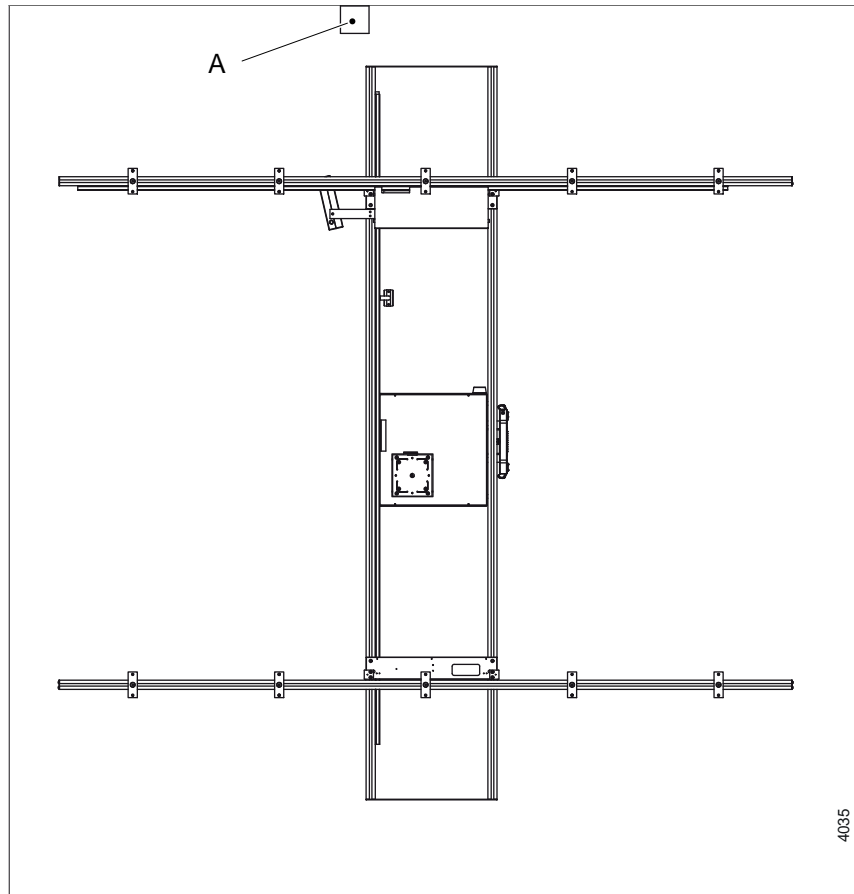


Fig. 4-6 Placing of cable outlet A, Ceiling suspended unit.

4.2 Table

4.2.1 Table overview

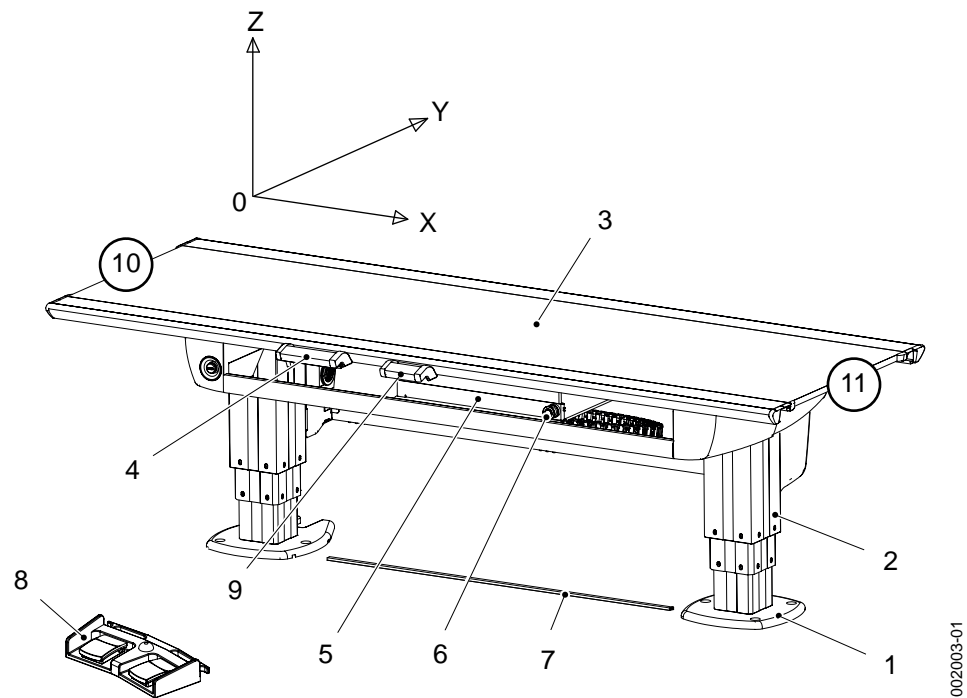


Fig. 4-7 Table overview

- | | |
|---|--|
| 1. Foot plate | 7. XY foot control strip type (Option) |
| 2. Column | 8. Foot control table top (X/Y/Z) (Option) |
| 3. Table top | 9. Collimator hand control (option) |
| 4. Table hand control (X/Y/Z, Ceiling tube pendulum movement) | 10. Head end |
| 5. Detector holder | 11. Foot end |
| 6. Brake release for detector holder | |

Component Specification

Table

4.2.2 General Specification

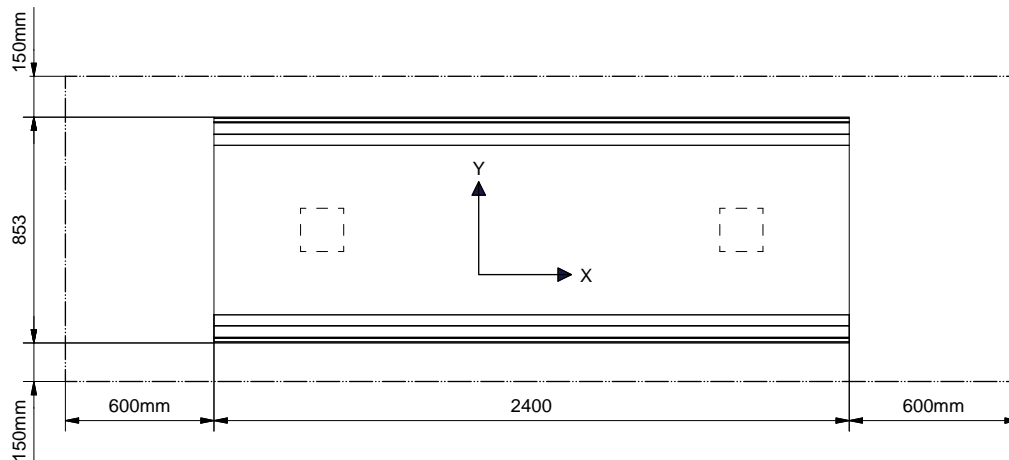


Fig. 4-8

The Fig. 4-9 shows the dimensions underneath the table

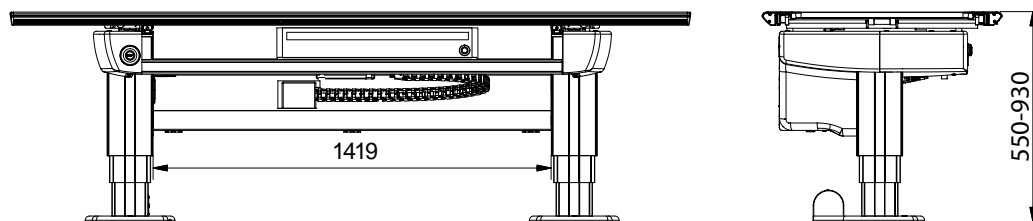


Fig. 4-9

- Table top dimensions = W2424 x H550 - 930 mm (with the table top)
- Table top dimensions = W1722 x D689 x H537 - 917 mm (without the table top)
- Table top dimensions = W2424 x D853 mm
- Table top transparent area = 2400 x 613 mm
- Table top thickness = 21.5 mm
- Table top aluminium equivalence = 0.9 mm
- Patient load = maximum 300 kg

4.3 Wall stand

4.3.1 Wall stand Overview

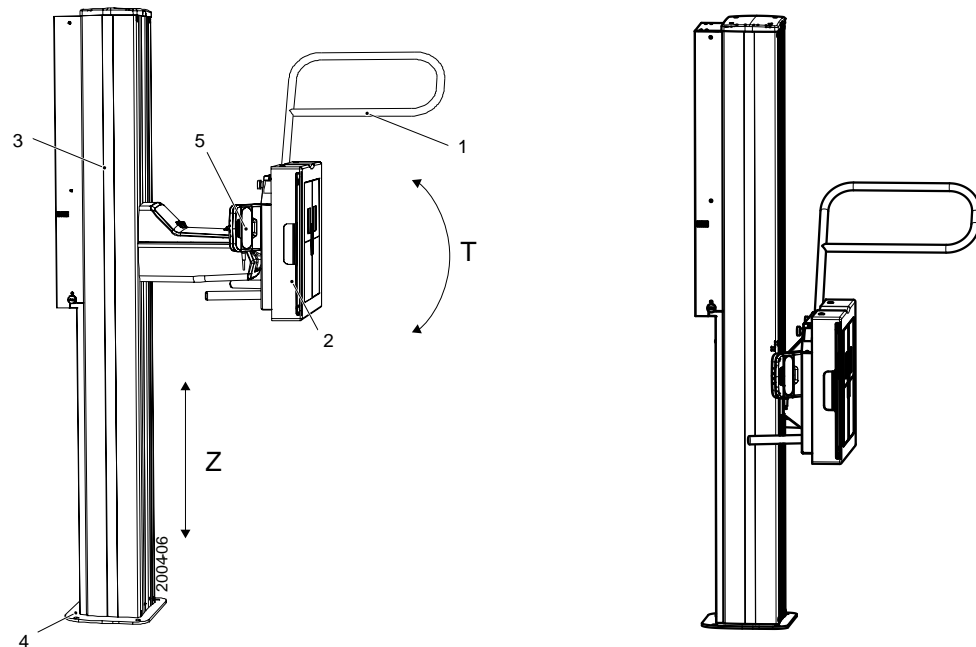


Fig. 4-10 Wall stand overview, *T = Tilt*

- | | |
|--------------------|---|
| 1. Lateral armrest | 5. Hand control
(Collimator and movement
adjustments) |
| 2. Detector holder | |
| 3. Column | |
| 4. Foot plate | |

Component Specification

Wall stand

4.3.2 General Specification

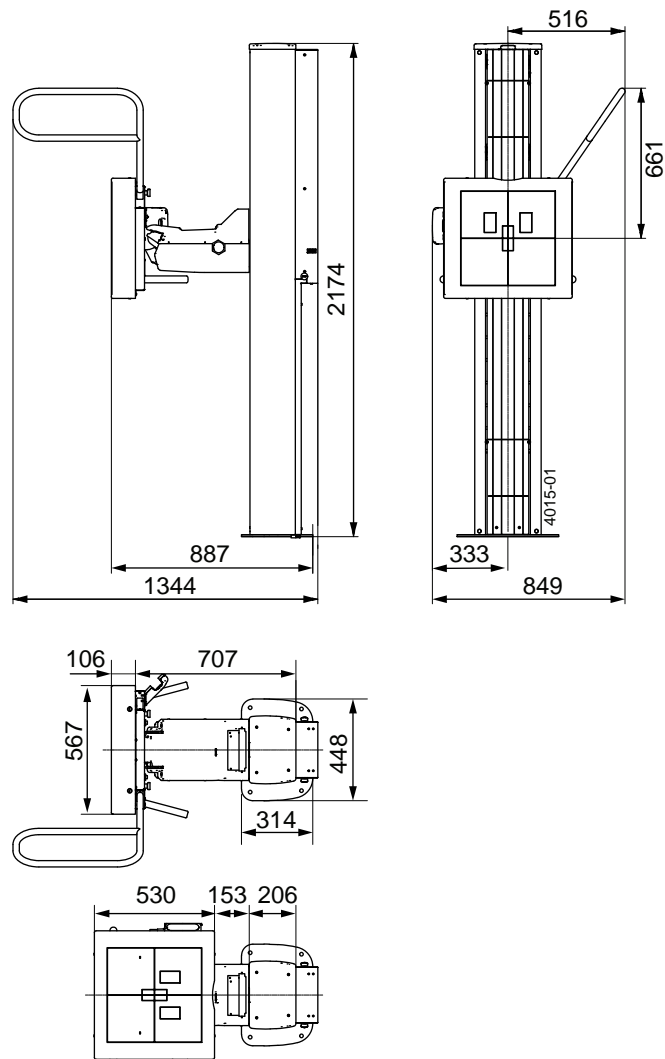
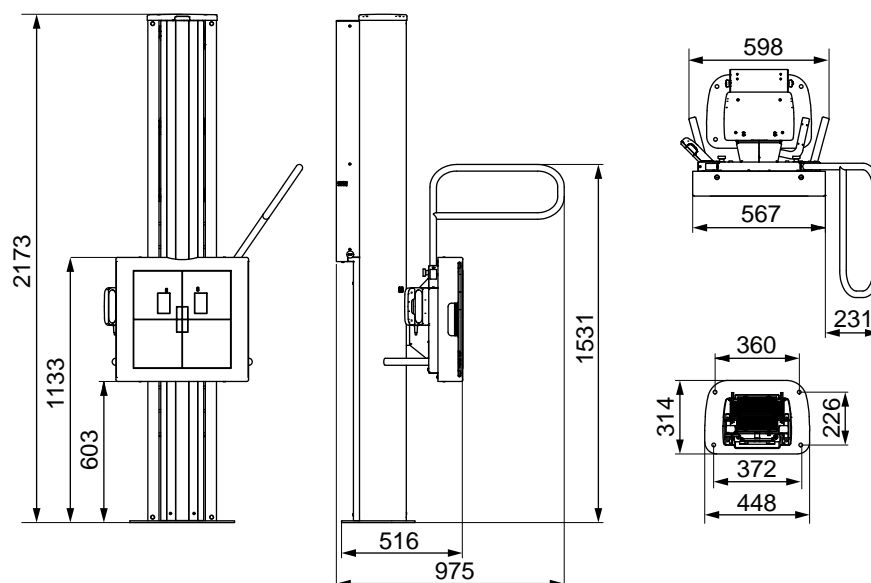


Fig. 4-11 Dimensions Wall stand/Image receptor



4091

Fig. 4-12 Dimensions Wall stand, non tilt

4.3.3 Movements

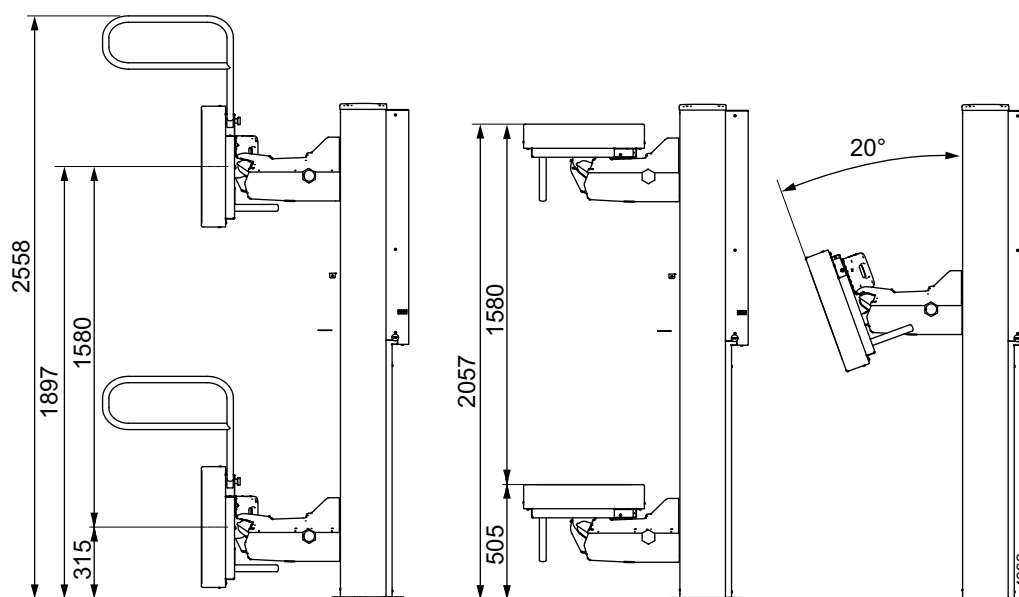


Fig. 4-13

4.3.3.1 Wall stand

The up and down movement of the wall stand is both manually and motorized controlled. The movement is counter-weighted, allowing a manual movement with a very limited applied force. For motorized movement the motor is connected to the shaft with a clutch, this is also to reduce the force for manual movement.

The tilting function is motor driven. With a tilting function the imaging unit can be set in any angles within a range of -20° to 90° .

Component Specification

System cabinet

4.4 System cabinet

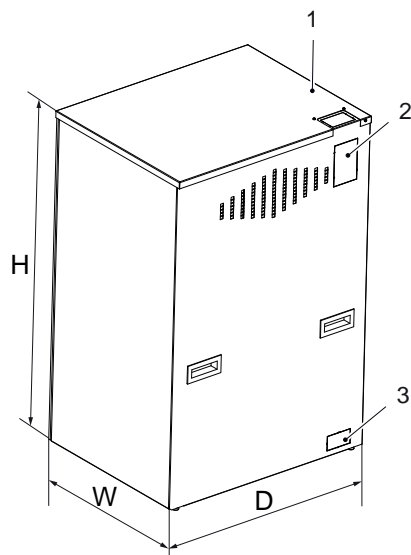


Fig. 4-14 Cabinet

1. Cabinet
 2. Cable outlet
 3. Alt. cable outlet
- General Specification
- Cabinet dimensions
 - W = 600 mm
 - D = 750 mm
 - H = 1125 mm
 - Cabinet weight = 134 kg

5 Technical specification

5.1 Electrical Characteristics

Mains voltage for the System	400 V 3N, 50/60 Hz 400 V 3~ 480 V 3~ Long-time (positioning) 2 A 50/60 Hz. Momentary (exposure):150 A, 50/60 Hz (Short term peak value), (recommended fuse 63 A, thermal breaker, B curve.) Class 1
Heat dissipation	1713 BTU/H

Generator Series and Mains Voltage	Generator Momentary Line Current	Apparent Mains Resistance	Recommended Minimum			
			Mains Disconnect to Generator (15 ft/5 m max)	Generator Service Rating	Distribution Transformer Rating	Ground Wire Size
50 kW 400 VAC, 3p	100 A	0.17 Ω	13.3 mm ²	100 A	65 kVa	13.3 mm ²
65 kW 400 VAC, 3p	125 A	0.13 Ω			85 kVa	
80 kW 400 VAC, 3p	155 A	0.10 Ω			105 kVa	
50 kW 480 VAC, 3p	80 A	0.24 Ω			65 kVa	
65 kW 480 VAC, 3p	105 A	0.19 Ω			85 kVa	
80 kW 480 VAC, 3p	130A	0.15 Ω			105 kVa	

Technical specification

Environmental Requirements

5.2 Environmental Requirements

Ambient transport and storage temperature	-25°C - +70°C
Ambient operating temperature	+10°C- +40°C
Transport and storage humidity (relative)	10-90%, non-condensing
Operating humidity (relative)	30-75% RH, non-condensing
Maximum transport and storage altitude	3000 m
Maximum operating altitude	3000 m
Maximum air pressure	700–1060 hPa
Noise	55dB or less (except single noise)

5.3 Ceiling suspended X-ray tube support

5.3.1 General

Rotation range ceiling (beta)	>340°
Rotation range tube arm (alpha)	>±135°
Column (Z stroke)	1750 mm

5.3.2 Configuration

OTC	The OTC is a mechanical part of an X-ray system.
-----	--

5.3.3 Weight

Total weight Overhead tube crane (4x4m traverse and rail) including cabling	372 kg
Overhead tube crane (including tube and collimator, ceiling wagon, column)	165 kg
Traverse (X-ray assembly, 4 m)	95 kg
Ceiling rail Y (4 m standard)	28 kg/each

5.3.4 Electrical Characteristics

Mains voltage	230 VAC, 50/60 Hz center tapped single phase 4 A
---------------	--

5.3.5 Classification

Classification according to IEC 60601-1.

Class	Class I equipment. All dead metal parts of the equipment are electrical connected to protective earth.
Applied part	Type B
Protection against ingress of water	IPXO
Mode of operation	Intermittent operation: 20%, maximum 1 min. ON / 4 min. OFF
Use of anaesthetic mixtures	The equipment is not suitable for use in the presence of flammable anaesthetic mixtures with air or with oxygen or with nitrous oxide.

Technical specification

Ceiling suspended X-ray tube support

5.3.6 Speed

	Low speed	Maximum speed
Z movement	60 mm/s	
X movement	250 mm/s	500 mm/s
Y movement	250 mm/s	500 mm/s
α movement	16°/s	
β movement	16°/s	
Image receptor holder movement (with 50 kg mass)	166 mm/s	350 mm/s

5.4 Cabinet

5.4.1 Dimensions

Dimensions (L x W x H) mm	750 x 600 x 1125 mm
---------------------------	---------------------

5.4.2 Weight

Cabinet	Max 134 kg
---------	------------

Technical specification

Table

5.5 Table

5.5.1 Column

Lowest table top position (from the floor to the table top surface)	550 mm
Column (Z stroke)	380 mm

5.5.2 Table Top

Table top dimensions	2424 mm x 850 mm
Table top transparent area	2400 mm x 613 mm
Table top thickness	21,5 mm
Length of stroke, X direction	± 600 mm
Length of stroke, Y direction	± 150 mm
Movement range of the imaging unit	>650 mm
Movement range of the detector	up to 850 mm

5.5.3 Weight

Table	Approximately 150 kg
Imaging unit	Approximately 21 kg
Table top	Approximately 47 kg
Maximum patient load	300 kg

5.5.4 Electrical Characteristics

Maximum power without external electronics	500 W
--	-------

5.5.5 Attenuation Equivalent

Table top	< 0.9 mm AL at 3.7 mm HVL
Detector holder	≤ 0.6 mm AL at 3.7mm HVL

5.6 Wall stand

Column, Z stroke	1580 +10/-10
Rotation range detector holder wagon (Only the tiltable detector holder wagon).	-20° - 90°

5.6.1 Attenuation equivalent

Detector holder	≤ 0.6 mm
-----------------	---------------

5.6.2 Weight

Wall stand	200 kg \pm 10
------------	-----------------

5.6.3 Speed

	Maximum speed
Z movement	200 mm/s

Technical specification

Wall stand

6 Energy consumption

Energy consumption measured according to the COCIR self-regulatory initiative for X-ray equipment.

Energy consumption	
Scenarios according to COCIR (March 2014).	[kWh]
Scenario-Off: The X-ray scanner is in Off mode for 12h during night time. $E_{tot} = P_{off} \times 12h + P_{ready} \times 12h$	2.72
Scenario Low: The X-ray scanner is in low-power mode during 12h night time. $E_{tot} = P_{lowpower} \times 12h + P_{idle} \times 12h$ (note 1)	4.31
Scenario-ready-to-scan: The X-ray scanner is in ready-to-scan mode for 24h as it is never switched to off or low-power modes. $E_{tot} = P_{ready} \times 24h$	5.43

Note 1: As the system has no dedicated idle state, idle state is considered the same as ready state

The following measurement data is used for the above calculations:

	Power (KW)
P_{off}	0
P_{lowpower}	0.13
P_{ready}	0.23

Off mode: The system is shut down, AC mains off, according to the user manual. The system consumes no energy.

Lowpower mode: The system functions into the minimum energy consumption state that the user can select according to the user manual. The system is switched off (miniconsole)

Ready mode: A state of the system when fully powered and ready to acquire image.

Energy consumption

7 Transport Specification

7.1 Crates

Table 7-1 Dimensions and Weight

Crate	Dimensions, mm	Weight, kg	Pcs
Ceiling suspended x-ray tube support	W800 x D1520 x H1300	458	1
Table	W795 x D2120 x H820	350	1
Table top	W895 x D2470 x H84	75	1
Wall stand	W790 x D2440 x H1225	345	1
Cabinet	W870 x D720 x H1330	186	1
Traverse rails	W830 x D4180 x H410	240	1



CANON MEDICAL SYSTEMS USA, INC.