SIEMENS

Sensation

	СТ
Planning Guide	
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This Planning Guide (**PG**) contains the required specifications for planning and on-site preparations for the

- SOMATOM Sensation 10
- SOMATOM Sensation 16
- SOMATOM Sensation Cardiac

Additional documents

Name	Reference source
Planning Guides	According to other CT products for an upgrade
DICOM Conformance Statement	Internet: http://www.med.siemens.de / DICOM Conformance Statement (in window "Search a topic")
Project Manager Handbook	Intranet: http://cs.med.siemens.de / For Service / Planning / Project Manager Handbook
Network Planning	Intranet: http://cs.med.siemens.de / For Service / Planning / Planning Guides / PACS Systems / Network Planning / Network Planning Guide
Siemens Remote Services SRS	Intranet: http://cs.med.siemens.de / For Service / Planning / General / Planning Guide Siemens Remote Services
DICOM	Intranet: http://cs.med.siemens.de / For Service / Planning / General / Projektierungsgrundlage DICOM
Checklist for the electrical installation	Intranet: http://cs.med.siemens.de / For Service / Planning / Planning Guides / CT Systems / Sensation / Sensation
Cameras from external suppliers	Request documents from the manufacturer

Preclarification

The following required CT components and accessories must be clarified by the on-site Project manager and indicated upon ordering:

- Type of cooling system.
- Required length of water hoses.
- Required length of system wiring.

Preliminary orders

There is no preinstallation kit for the Sensation family, i.e. in general there are no preliminary orders required. All CT components including accessories are delivered with the system.

If a preliminary order of specific parts or components does become necessary for planning or technical reasons, certain parts can be ordered in advance.

Cooling system

The following cooling systems are available and can be ordered in advance:

- Water/Air system
 - With 4 m air hose 1)
 - Spare air hose 4 m
- Water/Water system
- 1) If necessary, the hose can be shortened on-site. Longer lengths, respective extensions are possible.

Water hoses for both cooling systems

Water hoses are available in 3 lengths and can be ordered in advance.

- 10 m 1)
- 20 m 1)
- 30 m 1)
- 1) If necessary, the hoses can be shortened on-site

System Wiring

Two lengths of system wiring are available and can be ordered in advance.

- System wiring
 - 16m (short)
 - 25 m (long)
- Power wiring (depending on the BZ)
 - The power wiring (UDC cable W3 + ground cable W2) may not be rolled up in the cable duct and must, therefore, be ordered in the desired length. Shortening the cable on-site is difficult and requires special tools (see "Service Tools Catalog").
 - The total length required for the "power wiring" in the PDC and in the gantry is approx. **2.5 m**. This length should be added to the free cable length between both components.

On-site preparations

It is extremely important that all on-site preparations are completed upon the delivery of the complete system. This has to be reported to the division CT.

- This applies above all to ensuring that
 - There is sufficient floorspace for installing the gantry and the patient table as well as
 - Making sure that there is a suitable telephone or data network connection for **S**iemens **R**emote **S**ervices SRS (remote diagnostics).
- to observe
 - The regulations of the manufacturer in this Planning Guide,
 - The national regulations in your country and
 - The international regulations.

NOTE

The "Checklist for electrical installations" must be completed from the project manager and from the personnel performing the system start-up. They must confirm the accuracy of the information and provide their signature. Only then can the system be put into operation.

Important Safety Information

During planning, please observe the following safety information:

- The "Planning Guide" and "Installation Instructions" are mandatory technical documents for the planning, installation, and start-up of our CT systems. They ensure safe system installation and operation.
- Deviations and changes are not permitted unless approved and released by the CT product group.
- The project manager (or the installation manager in the respective country) is responsible for ensuring compliance with the specifications in the "Planning Guide" and "Installation Instructions".

∴WARNING

Risk of accident and injury

Failure to observe the guidelines specified in this document may lead to serious injury or loss of life.

□ The guidelines contained in this Planning Guide must be strictly adhered to!

Supplementary information for the Planning Guide

The following information must be submitted to the customer with the planning documents (applies only to Germany):

- Information sheet "General installation terms and conditions"
- Information sheet "General delivery terms and conditions"

Enter the following information in the planning documents (applies only to Germany):

- Please note the following information sheets:
 - "General installation terms and conditions"
 - "General delivery terms and conditions"

by Medical Solutions.

Note concerning drawings and diagrams

NOTE

All drawings and graphic diagrams in this Planning Guide are not to scale and are, therefore, not suitable for providing direct, accurate measurements.

Abbreviations, terms, and symbols

The following short definitions apply to the abbreviations, terms, and symbols used in this planning guide.

International

Name	Definition/Explanation
CFR	Code of Federal Regulations US statute book.
DICOM	Digital Imaging and Communications in Medicine World-wide standard in medical technology for image transfer and display.
DIN	Deutsches Institut für Normung; German Institute for Standardization
EG	Europäische Gemeinschaft; European Union
EMC	Electromagnetic Compatibility Effects of electromagnetic interference on electrical systems.
ESD	Electrostatic Discharge Term for electrostatic charge via electrical contacts and the air.
HF	High Frequency
IEC	International Electrotechnical Commission Commission for international electrotechnical standards.
IP Address	Internet P rotocol An IP Address is a logical 32-bit address consisting of a network ID to identify the host, and the host ID, which identifies an entity within the network (for example, a router).
ISDN	Integrated Service Digital Network Fast, digital phone network for telecommunications and teletransfer of data.
LAN	Local Area Network Local, chiefly company-internal network that serves to transfer data between different computers or other devices.
MODEM	Mo dulator- Dem odulator Converts digital data from the computer into analog data that can be understood by the conventional telephone network, and vice versa.
Router	A router connects network segments and transfers data between two networks that use the same protocol.
UL	Underwriters' Laboratory American testing and certification institute.
VDE	Verband Deutscher Elektrotechniker Association of German Electrical Engineers. Institute for electrical engineering standards in Germany.

Product-specific

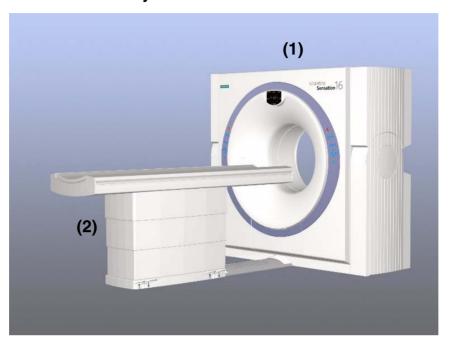
Name	Definition/Explanation
ICS	Image Control System Separate PC tower to manage the process in the complete CT system.
IMS	Image System Consists of the ICS, IRS, PC keyboard, mouse, and control box.
IRS	Image Reconstruction System Separate computer cabinet for image processing.
IES	Image Evaluation System Separate evaluation console with a PC tower for image processing.
LWL	Lichtwellenleiter; fiber optic cable.
PDC	Power Distribution Cabinet System-dedicated line-power distribution cabinet.
PHS	Patient Handling System Table for positioning the patient horizontally and vertically before and during the examination.
SRS	Siemens Remote Services Remote diagnosis tool for rapid localization of an error in the case of a malfunction by logging in to the system over the telephone or data network.
VPN	Virtual Private Network Private data network (internet tunnel connection) at the customer.
UPS	Uninterrupted Power Supply Battery-buffered power supply to get through brief power outages or interruptions.
X	Connector designation, with numbering. For example, X15, "connector numbered 15."

Editorial

Name	Definition/Explanation
Room Height	Room height is the clear distance measured from the upper edge of the finished floor to the lower edge of the ceiling construction (lower edge of the finished ceiling).
n.a.	not applicable.
•	Orientation Point Point belonging to system components which serves as a reference point when positioning system parts in relation to one another or in the room. The isocenter of an X-ray system is always depicted as an orientation point.
???	No information was available at the current time.

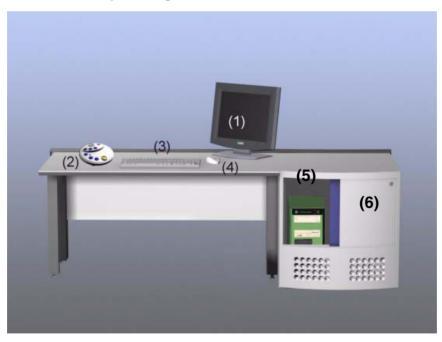
Standard components

Illustration: Gantry with Patient Table



- (1) Gantry
- (2) Patient table

Illustration: Operating Console with ICS



- (1) Monitor
- (2) Control Box
- (3) Keyboard
- (4) PC Mouse

- (5) ICS Tower PC
- (6) Container (optional)

Illustration: Power distributor cabinet



Illustration: Cooling system cabinet

The cabinet design of the heat exchanger water/water and the heat exchanger water/air are the same.



Illustration: IRS cabinet



Illustration: ICS and IES Tower PC



Illustration: Monitor 18"



(1) 18" flat screen color display monitor

Gantry

The generator is installed in the **water-cooled** gantry. This eliminates the need for a generator cabinet and the high voltage cable.

Patient Table

The patient table is almost identical to the Volume Class / Sensation 4 table with the exception of some changes to floor mounting, to the connection piece, to the Cardio option and to the cover sections.

Image System (IMS) / Volume Navigator

The IMS includes the ICS, IRS, PC keyboard, mouse, and control box. The ICS consist of a PC tower, the IRS of a processor cabinet. The PC keyboards are to be ordered depending on the country. The control box and mouse are part of the IMS components.

Monitor

A 18" flat screen color display monitor is delivered with the CT system.

Image Evaluation System (IES) / 1st Wizard

- In standard delivery volume at Sensation Cardiac only.
- Option at Sensation 10 and Sensation 16.

The IES is a separate evaluation workstation for image post-processing and consists of a standard tower PC with 18" flat screen color display monitor, keyboard and mouse. It should be located close to the operator's console.

An **Ethernet Switch** and a **distribution box for mains supply** are also supplied with the IES.

The Ethernet Switch (Type: AT-FS708) consists of eight ports (10/100 Mbps MDI-X) and 1 Uplink (MDI) port. It is supplied with a wall mount kit and should be mounted on the wall behind the operating console, in the middle between ICS and IES.

The line power distribution terminal has 6 IEC jacks and is protected with 10 A.

Control box

The control box is an additional panel beside the host computer keyboard that contains CT-specific additional user interface elements required at CT facilities.

It contains an intercom to communicate with the patient, power ON/OFF switches, function switches, and a radiation indicator.

Switch box

The switch box interfaces between ICS, IES, control box and the different components. It must be located close to the operating console and the ICS.

Router / VPN

For SRS (Siemens Remote Services) remote diagnosis, the CT system must be connected to a router or to a internet tunnel connection (VPN).

Power Distribution Cabinet (PDC)

The power distribution cabinet is similar to that of the Volume Class / Sensation 4. However, it also houses a part of the generator to produce the UDC voltage and insertion slots for optional UPS's.

Cooling system

Only the gantry is water cooled. All other components are air cooled.

There are 2 cooling systems available for cooling the gantry:

- Cooling system water/water 1) or
- Cooling system water/air 2).

NOTE

- When water/water cooling systems are used, a water connection must be provided on-site.
 If no water connection is present, we recommend using the water/air cooling system.
- 2) When water/air cooling systems are used, one exterior wall with a corresponding outlet to the outside must be provided because the power outlet runs via air hoses to the outside.

Camera

All DICOM-compatible cameras released by Siemens may be connected.

- Info about released cameras at
 - http://cs.med.siemens.de/For Service/CAMERAS/CT

The minimum requirement for all cameras used is 32 MB of memory or data compression because the images are sent per film as 20 MB files.

Cameras that are not DICOM-compatible can be connected, if the camera manufacturer provides the necessary DICOM BP interface as well as the required software and firmware.

Preferably, the camera is connected at the Ethernet switch.

NOTE

The cable from the Ethernet switch to the on-site network connection is not part of the delivery volume.

- Required
 - Cable, direct-contact S/UTP, RJ45.
- Available
 - Length 5 m, item number 3074515 and
 - Length 30 m, item number 3074523.
- As an alternative, the camera can be connected directly via a cross-contact cable. The cable must be provided **on-site**.

NOTE

- For questions regarding camera connection, please contact the Headquarter Support Center HSC via the hotline number.
- For a precise calculation of costs and in order to avoid delays during start-up, the connection of existing cameras to the CT system must be checked in advance by the Project Manager.

Options

General Information

The system information (SI) diagram in the price communication shows **all** available options.

Operator's console

The operating console is available in widths of 120 cm and 140 cm. Height and depth are the same for both versions.

System furniture

There are different furnishings available in the system design. Depending on customer requirements and according the local conditions, these can be ordered from the furniture manufacturer.

Address of the furniture manufacturer:

Fa. Popp Erlangener Strasse 17 91083 Baiersdorf Germany

- Additional technical information
 - See "System furniture" on page 5 8.

Container for ICS and IES

An identical container is offered for the installation of the ICS and the installation of the IES (with optional USV).

The container can be placed to the left or to the right of the operating console.

- See "Sample rooms" on page 2 - 1 and "Technical Data" on page 5 - 1.

2nd Wizard

A 2nd Wizard is offered as an additional separate evaluation console (IES) with an optional USV.

Additional monitors

- As an additional monitor for the IMS imaging system you can connect a 18" flat screen monitor.
- The additional monitor is connected with fiber optic cables to the ICS.
 Two lengths are available:
 - Standard: 30 m.Optional: 120 m.

HeartView CT

The "HeartView CT" option is used to trigger the radiation release in cardiological examinations and to prevent motion artifacts due to the heartbeat; it is integrated in the Gantry and Patient Table.

CARE Vision CT

The option "CareVision CT" is used for special clinical examinations to display real-time images.

- Required installation preparations
 - See "CARE Vision CT" on page 7 1.

NOTE

The hardware functionality is available from software version VA60.

UPS for IMS

An uninterrupted power supply may be used in countries with unstable power line supplies. These power supplies provide power to run the IMS (ICS, IRS and 1st Wizard) for 3 minutes during brownouts or power failures.

- The UPS should be installed in the PDC cabinet.
- Note the EMERGENCY switch in the on-site power distributor.
- The UPS can be ordered from the factory.

UPS for IES

An uninterrupted power supply may be used in countries with unstable power line supplies. In case of power failures or brownouts, all functions of the IMS and the monitor are supported for 3 minutes. In addition, an acoustic alarm sounds.

- The UPS must be ordered in the configuration specific to the country. For
 - 120V and
 - 230V.
- It should be located close to the IES.
 - It can also be located in the optional IES container.

UPS for the entire system

An UPS for the entire system (manufacturer "Jovyatlas") with battery back-up can be ordered. In case of power outage the operation of the entire system is possible for 1h.

- SAP-order number: 7438000
 - At Siemens in Erlangen Eltersdorf, Dept. SPH 1

NOTE This UPS has no UL licence.

Sample rooms

Note

The sample rooms on the following pages show possible configurations of system components.

Other configurations are possible, if device distances based on the available cable lengths are not exceeded and the required safety and minimum distances are maintained.

• Sample room without power room and control room

 illustrates an example of the minimum room size without a power room taking into account the required service and safety distances from walls, e.g., in compliance with the German "Maschinenschutzgesetz" (law governing safety when operating machines).

Sample room with examination room, power room and operators room

- illustrates a recommended sample room **with** a power room, taking into account the required service and safety distances from the walls, e.g., in compliance with the German "Maschinenschutzgesetz" (law governing safety when operating machines).

MARNING

When the distances are less than the required safety distances,

safety measures must be provided in accordance with national codes, for example, barriers, warning signs, safety switch plates, etc.

Room height

The required minimum technical room height for the gantry is **2300 mm**.

Room volume

The minimum room volume for the water/air exchanger is **14.5 m**³.

NOTE

The minimal room volume is a safety precaution, with respect to the amount of coolant in the water/air exchanger, in case coolant escapes because of a defect and evaporates in the room.

List of individual components

The table shows the correlation of individual components to the following examples.

No.	Name	
1	Gantry with patient table.	
2	PDC (stationary generator/line power distributor).	
3	Heat exchanger (water/air in this example).	
4	IRS cabinet.	
5	Operator's console with monitor, keyboard, control box (5a) and mouse.	
6	ICS tower PC in optional container.	
7	IES tower PC in optional container with monitor, keyboard, mouse.	
8	Optional container.	
9	Telephone connection or network connection.	
10	Power socket.	
11	ON/OFF switch.	
	Must be installed in compliance with IEC60601-1 and UL 2601 / CSA114.	
12	Cable outlet for monitor (CARE Vision CT option).	

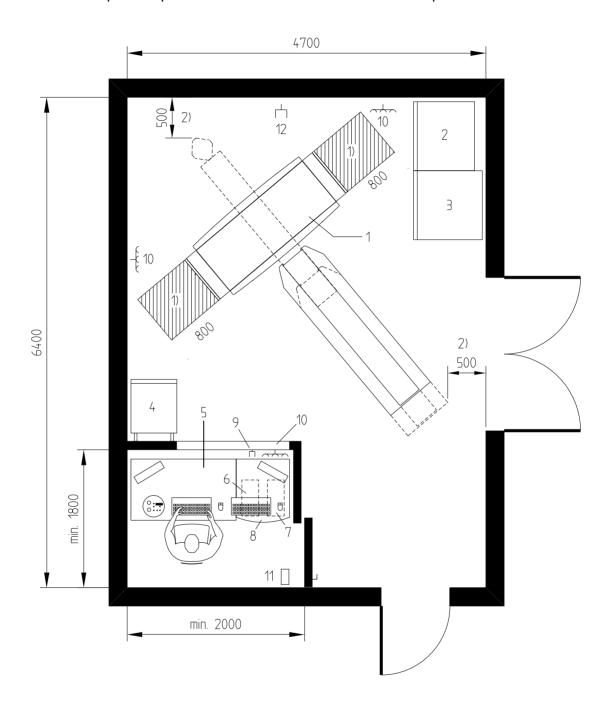
1, 2, 3, 4, 5, 6, 7, 8 in delivery volume 9, 10, 11, 12 on-site

NOTE

This does not include the space required for an on-site cooling system to air-condition the examination room.

Sample room without power room and control room

The entire space required with control room in this room example is 30 m².



- 1) For service
- 2) Safety distance

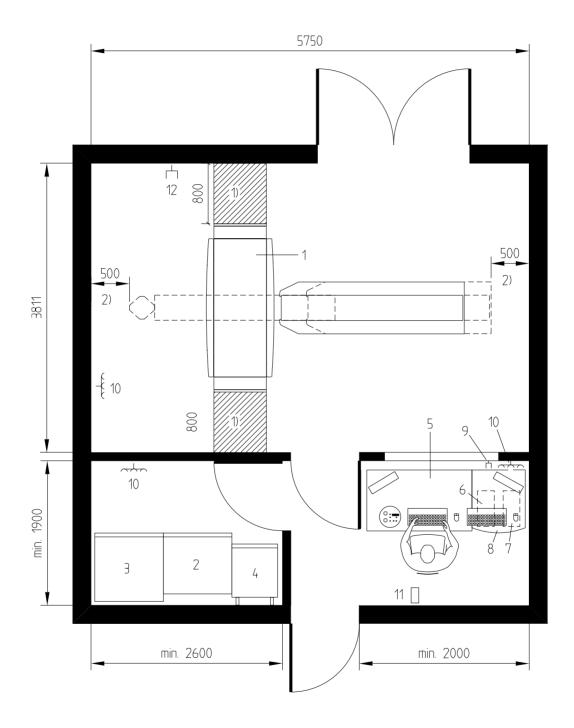
Sample room with examination room, power room and operators room

The entire space required in this room example is 30.65 m²

• Examination room: 21.91 m²

• Operators room: 3.80 m²

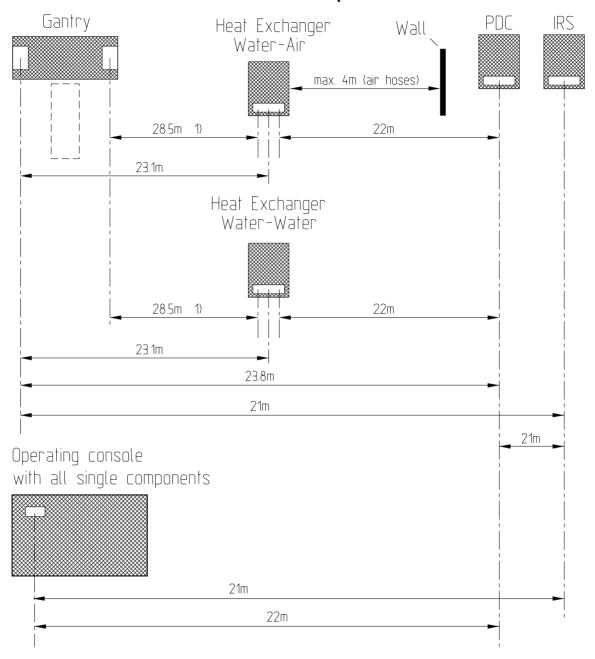
• Power room: 4.94 m²



- 1) For service
- 2) Safety distance

Arrangement of the Components

Maximum Distances for the individual Components



1) Water hoses

NOTE

Total cable length is made up of the length of free cable between the components and the length of cable required within/for the components.

- Measurement data are based on the lengths of cable available between the individual components' floor inlets for
 - 25 m wiring kit and
 - 30 m water hose.

Maintaining eye contact with the patient and scan field

When planning a room, ensure that eye contact with the patient and scan field is maintained. This can be realized also with video cameras. The observation monitor should be placed close to the operator's console.

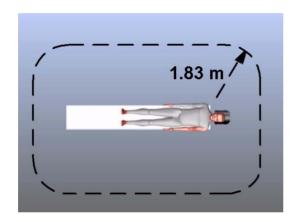
Minimum distances to non-system components (EMC)

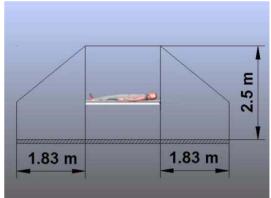
To avoid mutual inteference between the CT system and, e.g., MR systems, ECG, and EEG workstations, **minimum** distances must be maintained.

See "Electromagnetic compatibility (EMC)" on page 5 - 12.

Minimum distance to the patient

The following distances from the patient to the additional CRT monitor, heat exchanger, IRS cabinet, IES and other non-medical components must be maintained:





Service and safety distances

- All indicated distances from walls (e.g., for service and system cooling) must be maintained.
- Distances from walls to motorized moving parts must be maintained in compliance with national regulations.

NOTE

The maximum travel of the tabletop with installed headrest/armrest must be observed.

See "Gantry with patient table" on page 5 - 2.

Layout for the cooling systems

- Due to the high noise level of the fans, we recommend installing the heat exchanger in a separate control room.
- The cooling system can be installed to the left or right of the PDC, or independent of the PDC in another room.
- The air hose connections for the water/air heat exchanger must always be connected to an exterior wall or to an air-conditioned room.

Heat exchanger height difference to the gantry

The maximum acceptable height difference between the heat exchanger and the gantry may not exceed **±4 m**.

Information about the on-site line power distributor

To ensure trouble-free operation, we recommend that the main power line run directly from the house transformer to the system distributor.

The main power line should be routed directly from the on-site power distributor to the CT system power distributor.

NOTE

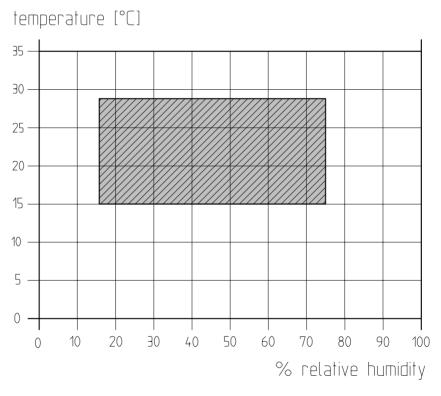
Other consumers such as X-ray, MR and CT systems, elevator motors, air conditioning or lighting systems may not be connected to this power line.

Environmental requirements

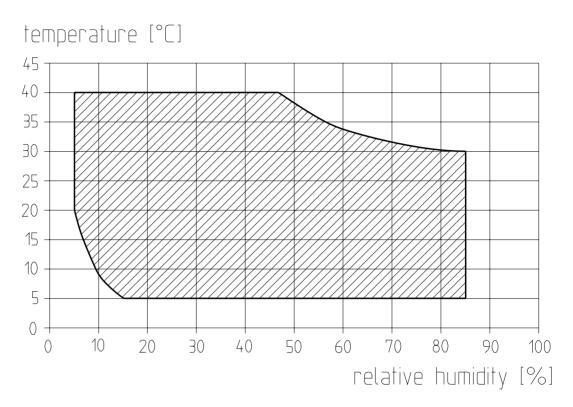
Temperature/Relative humidity in the room (climatograms)

Components	Air temperature	Relative humidity	Temperature gradient max.	Air pressure
	[°C]	[%]	[K/h]	[hPA]
Examination room with gantry and patient table 1)	15 to 28	15 to 75		
Control room with operator's console, control box and ICS, IES 1)	15 to 28	15 to 75	10	700 to 1060
Cooling system water/water or water/air 2)	5 to 40	15 to 85		
IRS- and PDC cabinet 3)	15 to 35	15 to 75		

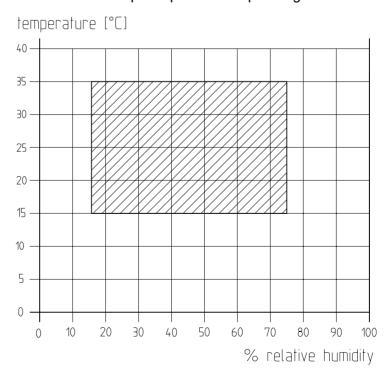
1) The diagram shows the climatic prerequisites for operating the gantry with patient table and control room with ICS, IES and the accompanying monitors.



2) The diagram shows the climatic prerequisites for operating the cooling system (water/water and water/air).



3) The diagram shows the climatic prerequisites for operating the PDC.



Recommended room climate in the examination room

The following table shows the ideal parameters for room climate in the examination room.

Room temperature	Relative humidity
22°C (71.6°F)	40% to 60%

Temperature gradient

The maximum permissible temperature gradient is 10 K/h.

Ventilation and air filters

For external air supply (fresh air), we recommend using coarse filters of class EU3 to EU4 to filter out on-site dust particles >10µm (DIN 24185 / part 2).

NOTE

If the required climatic ranges cannot be ensured througout the changing seasons, appropriate measures have to be performed to maintain the room climate.

See "Dimensions, weights, noise levels, heat dissipations" on page 5 - 1.

Hazardous air pollutant content

The room ventilation should ensure that **aggresive pollutants** are prevented from entering the room.

The room air should be protected against contamination by **hydrogen sulphide**, even in small amounts.

The most well-known sources of hydrogen sulphide include:

- Exhaust fumes and waste water from developers,
- Exposed sewer drains,
 - no siphon in the sewer pipe or in the floor drain
- Exhaust fumes from diesel power units
 - Emergency power, etc.

If a danger of such contamination exists, corrective actions have to be taken e.g.

- Extractor fans
- Siphon
- Modification of ventilation intake, etc.

Cable ducts and floor openings

- In compliance with the IEC and UL, cable guards are necessary. Therefore, **all cables** <u>in</u> or <u>on</u> the floor **must** be routed in on-site cable ducts.
 - Coolant hoses are also similarly routed, i.e., in on-site cable ducts.
 - We recommend that you install the cable duct preferably in the floor.
 - If cables and hoses are routed in the floor, the appropriate system component floor openings must be provided.
- · Additional information see
 - "Cable ducts" on page 3 8 and
 - "Floor outlets and wall distances" on page 3 8.

NOTE

When routing cables and coolant hoses from the side and laying cable on the floor, you must cut an opening into the covers of the gantry's lateral stands (feet).

Cables and hoses to the cabinets are routed via the base of the respective cabinet.

Floor load due to the gantry

NOTE

The gantry may not be installed directly on installation floors. Remove the installation floor in the area of the installation support and replace it with a subfloor construction. See "Proposal of a subfloor construction for access floor" on page 3 - 24.

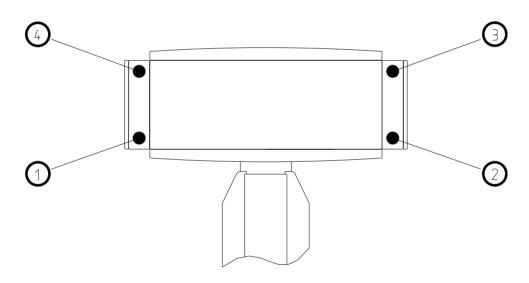
Vibrations during scanning operation

The gantry with patient table and on-site mounting frames must be installed so as to be free of vibration.

Measuring the floor load

Definitions:

Name	Explanation
F _{stat}	static floor load due to the weight of the gantry
Amplitude	difference between the minimum and maximum floor load during gantry rotation



Measurement point	1	2	3	4
F _{stat max} [N]	5140	5140	5140	5140
Amplitude for F _{dyn} [N]	416	306	509	572
Support surface per adjustable foot	24,46 cm ²			

NOTE

- 1. The values indicated for floor load are valid only if the gantry is level (even level adjustable feet).
- 2. The static values can deviate about \pm 10% from the given values in the table.

On-site requirements for the water/water cooling system

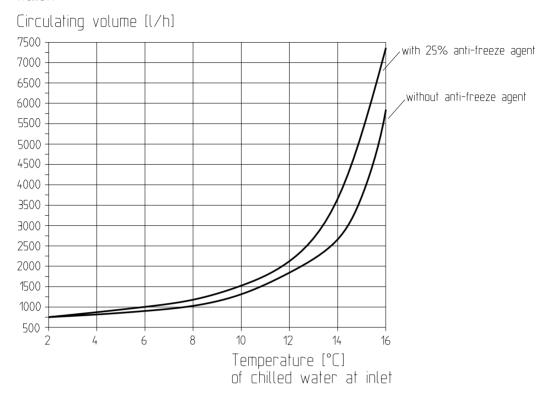
Overview

An on-site connection to the hospital chilled water supply must be available for the primary circuit of the cooling system.

Power output to the on-site chilled water	15.0 kW Note: Different value at exchange of a Somatom Volume Zoom / Volume Access / Sensation 4; see "Upgrade to a SOMATOM Sensation 10/16" on page 8 - 1.			
Water temperature	2 - 16°C			
Temperature gradient	max. 0.5 K/min			
Operating pressure	May not exceed a maximum pressure of 10 bar.			
Flow rate	The flow rate depends on the temperature of the chilled water. Refer to the diagram "flow rate of the on-site heat exchanger" in this chapter. If the flow rate from the on-site water supply is insufficient, a pump having the appropriate power should be installed.			
Switch off	The water circulation when the CT system is not in use. This can be done via a magnetic valve installed on-site or by switching off the feed pump via a contactor. There is a non-referenced switch contact (X263, PIN 3/4) in the PDC. Load capacity max. 277 V/2 A ~, 24 V/2A =, use category AC-14/15 and DC 12/13.			
Water quality	We recommend water of drinkable quality. With water of lesser quality, a filter must be installed with a mesh of 0.2 mm in the primary inlet.			
Antifreeze agent	Add to the primary circuit only. Recommendation: Protection to -20°C. Adding antifreeze agent reduces the cooling power and the water flow rate will have to be increased. Water with antifreeze from the on-site chiller must be at least +2°C. Only water at this temperature may flow through the water/water cooling system. See "Notes for antifreeze agent" on page 2 - 15.			
Temperature deviation	The on-site chilled water supply has heated up, (worst case scenario) refer to the formula. $\Delta t[K] = \frac{15,0x(860)}{(Flowrate)[1/h]}$			
Service	The installation of ball valves is recommended for troubleshooting. A temperature indicator for the primary and secondary circuit and a flow rate indicator is integrated in the WCS.			

Required flow rate for the on-site cooling water (primary circuit)

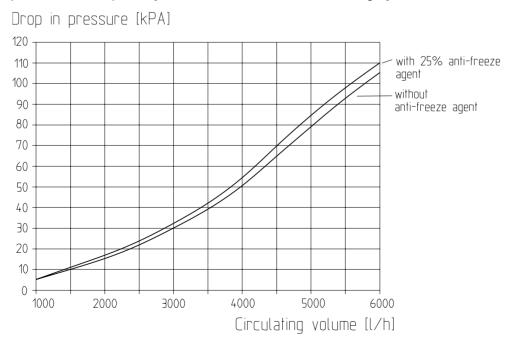
The diagram illustrates the required flow rate at a certain temperature of the on-site chilled water.



Air pressure: 70 to 106 hP

Required differential pressure in primary circuit of the water/water cooling system

The diagram shows the relationship between the flow rate and the minimum differential pressure in the primary circuit at the water/water cooling system.



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 03.03
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 Medical Solutions

Notes for antifreeze agent

Mixture values [%]

Antifreeze to [°C]	-10	-15	-20	-25	-30	-35	-40
Antifrogen N 1) (ethylene glycol)	20 % 2)	27 %	34 %	39 %	44 %	48 %	52 %
Antifrogen L 1) (propylene glycol)	25 % 2)	32 %	38 %	43 %	47 %	52 %	56 %

- 1) note the specification of the manufacturer if using other types of antifreeze agent.
- 2) from this mixture value and higher it is a very good corrosion prevention for every metal (except zinc).

On-site requirements for the water/air cooling system

The air hoses are connected

- to an outer wall (recommendation) or
- to an air conditioned room.

Requirements for wall ports

When connecting the air hoses to a wall special wall ports for air intake and air exhaust are needed.

- Intake flaps and exhaust flaps must open automatically due to the air stream produced when the ventilator is switched on.
- Protective screen, e.g. against birds, etc.
- Circular wall ports with an outside diameter of 400 mm.
- A minimum distance of 1 m must be maintained between air intake and air exhaust.
- The wall ports are not delivered with the system. They have to be supplied locally. If local supply is not possible, one set of wall ports (includes air intake and air exhaust) can be ordered under:
 - order number: 2NK6828
 - order address:

KKW

Kulmbacher Klimageräte-Werk GmbH

Am Goldenen Feld 18

D-95326 Kulmbach

Germany

- Technical data for the wall ports delivered by KKW:
 - See "On-site connection of the air hoses" on page 3 17.

Temperature range for the air intake

The temperature range is -25°C to +40°C

NOTE

If the temperature of the air intake is higher or lower than the indicated range, it must be mixed with room air.

- Provisions have to be made by the customer.
- At sub-zero temperatures, back draft flaps should be installed in the wall port to prevent the accumulation of ice.

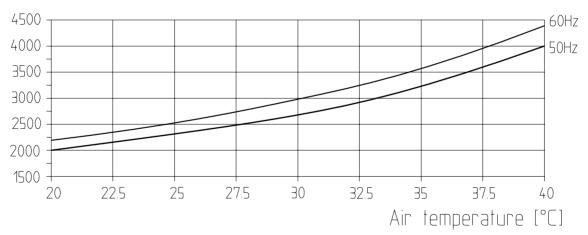
Required air flow rate

 The required air flow rate is 4000 m³/h at a total power dissipation of 26.0 kW to the waste air and 40 °C air intake temperature.
 Note:

Total power output = gantry cooling power + power dissipation of the heat exchanger

- Nominal values of the ventilator (integrated in the water/air cooling system):
 - 50 Hz: 4000 m³/h 1)
 - 60 Hz: 4500 m³/h 1)
- 1) with $\Delta p = 100 Pa$ (internal pressure drop!)

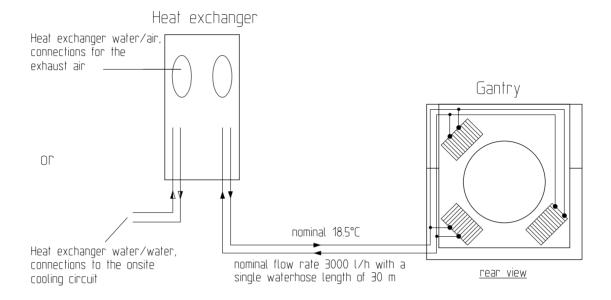
Air flow rate [cbm/h]



On-site requirements for filling the secondary cooling circuit

The on-site requirements for filling the gantry cooling circuit apply to the **water/water** and **water/air** cooling systems.

The secondary cooling circuit consists of the secondary water cooling circuit of the cooling systems, the water hoses between the cooling system and the gantry, the mixing unit in the left gantry stand and the heat exchangers in the gantry.



- Fill the heat exchanger with tap water.
 - Drinking water quality.
- The static fill pressure must be set to 2 bar ± 0.2 bar after filling.
- The pump in the secondary cooling circuit generates an operating pressure of
 5.0 ±1.0 bar at the pump outlet. This pressure drops within the cooling circuit to approx. 2 bar at the pump inlet.
- The water volume in the secondary cooling circuit is approx. 50 I, not including any hose extensions.

NOTE

Operation without water will damage the pump!

Do not operate the pump in the secondary cooling circuit <u>without</u> <u>water</u> in the system.

We recommend that the following be installed near the system:

- water valve with a 3/4" screw connection
- water drain, e.g., a sink

On-site requirements for radiation protection

General

Prior to beginning operation with a CT system, radiation protection zones must be set up and delineated, so that access and occupational zones are restricted when the X-ray tube is in operation.

DIN 6812 contains the radiation protection guidelines for Germany pertaining to protection from injury resulting from radiation exposure.

NOTE

Adhere to the IEC 60601 and CFR 21 or the corresponding country-specific regulations.

Visual radiation readiness indicator

The possibility to connect a visual radiation readiness indicator according to **IEC60601-2-44 and CFR 21** is prepared in the CT system.

Connection: PDC cabinet.

Connected load: floating ground contact, max. connection values

- 230V/5AAC or
- 24 V / 2 A DC.
- See "Mains and protective conductor connections" on page 4 3.

Visual radiation-ON indicator

A visual radiation-ON indicator according to **IEC60601-2-44 and CFR 21** is already installed in the gantry (in the front and rear operator panels).

The possibility to connect an additional **separate** radiation-ON indicator is prepared in the ct system.

Connection: PDC cabinet.

Connected load: floating ground contact, max. connection values

- 230V / 5 A AC or
- 24 V / 2 A DC.
- See "Mains and protective conductor connections" on page 4 3.

Radiation switch off

A door switch may be installed (normally open) to block radiation release when the door of the examination room is open.

Location for connection: PDC cabinet.

- See "Mains and protective conductor connections" on page 4 - 3.

Recommended room equipment

Smoke and fire alarms

We recommend installing smoke and fire alarms in the vicinity of the system.

Fire extinguisher

Observe the **country-specific** fire codes as well as insurance requirements.

NOTE

In case of fire, use only ${\rm CO}_2$ fire extinguishers to prevent damage to the system.

Light box

We recommend installing a light box in the **system control room**.

Data carriers, technical documents, service equipment

Data carriers, technical documents and service equipment should be stored in a common area near the system.

Film processor

To develop and document films, a camera and a film processor should be located near the system.

Requirements for workstations with monitors

EU Directive 90 / 270 / EEC, Fifth Individual Directive Pursuant to Article 16, Paragraph 1 of Directive 89 / 391 / EEC, concerning the minimum regulations for health and safety protection when working at monitor workstations, must be observed. The monitor and keyboard are in compliance with these directives.

Requirements for room lighting

According to **DIN 68 68-57 (international standard in preparation)** lighting in rooms where diagnosis is performed on monitors must comply with the following requirements:

- Luminescence is to be adjustable and free of glare, and the setting must be reproducible (for example, dimmer with scale).
- No glare or reflections from windows, lights, and displays in the normal operating positions of the monitors.



The monitors comply with the "Directives for Diagnostic Monitors" as long as the corresponding room requirements are fulfilled.

Siemens Remote Services (SRS)

General information

A router are not automatically supplied with the CT system. It must be ordered separately. The "Planning Guide SRS" contains all planning-related information and can be found on the intranet at:

- http://cs.med.siemens.de/For Service/Planning/General/ Planning Guide Siemens Remote Services
- http://cs.med.siemens.de / For Service / Siemens Remote Services / MODEM => Router Migration / Planning Guide Siemens Remote Services
- http://cs.med.siemens.de / SRS Connectivity Toolkit / PM

General safety information

- The applicable **national** regulations must be adhered to when carrying out any work.
- Observe local authorized regulations.
- In countries prone to earthquakes, you must secure all system components to the floor in accordance with national regulations.
- To avoid accidents (e.g., "stumbling"), do not leave the cables lying on the floor. Preferably, cable ducts should be installed in the floor.
- The manufacturer only requires that the patient table be securely attached to the floor.
- Gantry and patient table may **only** be placed or installed on concrete or suitable mounting frame.
 - See "Requirements for existing mounting frames" on page 3 20 and "Proposal of a subfloor construction for access floor" on page 3 24.

NOTICE

Securing the patient table to the floor is mandatory!

You must be familiar with the notice in this chapter regarding securing the gantry with patient table!

On-site electrical installation

General safety notes and regulations

- All your work must comply with the
 - "Accident Prevention Regulations for Electrical Systems and Operations" (BGV A2/04.79) in Germany, or
 - The corresponding national codes and "Accident Prevention Regulations for Electrical Systems and Operations" in your country.
 - See "Information about the on-site line power distributor" on page 2 7.
- Also observe the
 - regulations in effect in your country regarding electrical safety.
 In Germany, it is principally the standards in series DIN VDE 0100 and DIN VDE 0107 that are applicable.
- On-site electrical installation requires a power line in accordance with the local country code (for example, VDE, IEC, UL) which is run to the location of the PDC.

NOTE

- Do not connect any external users to the CT power line (main trunk).
- Comply with the line impedance specifications.
 - See "Line voltage, line frequency, internal line impedance" on page 5 9.
- EMERGENCY SHUTDOWN:

An installed EMERGENCY OFF switch must not reset on its own. For reasons of safety, <u>all components</u> of the CT system must be switched off when the EMERGENCY OFF switch is activated.

• PDC - mains connection:

The on-site installation of an ON/OFF switch must be carried out in compliance with CE and UL requirements.

The PDC connection to the on-site line power distributor <u>must</u> be

a permanent connection (no plug).

IES

For 230 V connections, a PE conductor must also be connected to the UPS.

ON-OFF switch for disconnecting power

To disconnect the power, an **on-site** ON-OFF switch (controlled line relay) / load switch with **a signal lamp / switch position indicator must** be installed in accordance with **IEC60601-1** and **UL 2601 / CSA114**.

For this function you can also use a **circuit breaker** with a **switch lever** and a **switch position indicator**.

EMERGENCY SHUTDOWN switch

Emergency shutdown switches must be installed in the examination room in accordance with local safety codes and regulations for the specific country. The switch should have a lock which prevents it from being inadvertently **switched back** on.

Surge protection

In order to prevent malfunctions and damage, a surge protector or lightning arrester should be installed in accordance with **IEC 1024-1 and IEC 1024-2** to comply with the surge values specified in **IEC 60601-1-2**.

NOTE

A surge protection has been built into the CT system power supply up to 2 kV. If additional surge protection is required, it must be installed before the ground-fault detector.

Protective conductors

The permitted protective conductor between the on-site power supply and the protective ground connection in the PDC may be **max. 0,1** Ω .

NOTE

In addition, when connecting the IMS and the IES to 230 V, a PG conductor must be permanently connected to the UPS.

Line type

Only symmetric **TN** or **TT** lines are allowed (neutral point connected to earth). At **TT** lines you must install a ground-fault detector switch. In general, connecting the CT system to IT lines is not permitted.

Ground-fault detector switch

An **additional** ground-fault detector switch can be installed in the on-site power distributor. The installation of a ground-fault detector switch is country-dependent.

Function: Power shutdown following the occurrence of ground faults.

• According to DIN VDE 0107, a ground-fault breaker must be installed in Germany. If required by country regulations, the following information applies:

Voltage Range	Ground-fault detector
380 V to 420 V	125 A / 300 mA, e.g. Siemens, Type 5SM3 645-8 or type from another manufacturer for alternating fault currents, surge-protected; selective, respective short-time- delayed switch-off system.
440 V to 480 V	Type from another manufacturer: ground-fault detector switch with $I_N = 300$ mA for alternating fault currents; surge-protected, corresponding to the fuse; respective short-time-delayed switch-off system.

On-site line fuses

The on-site fuses specified by CE and UL must be installed to protect the system.

Voltage Range	Fuse (short circuit protection) 1)		
380 V to 480 V	100 A NH, type gl/gG selectivity 1:1.25	125 A NH, type gl/gG selectivity 1:1.6	

1) The corresponding fuse values are required due to selectivity

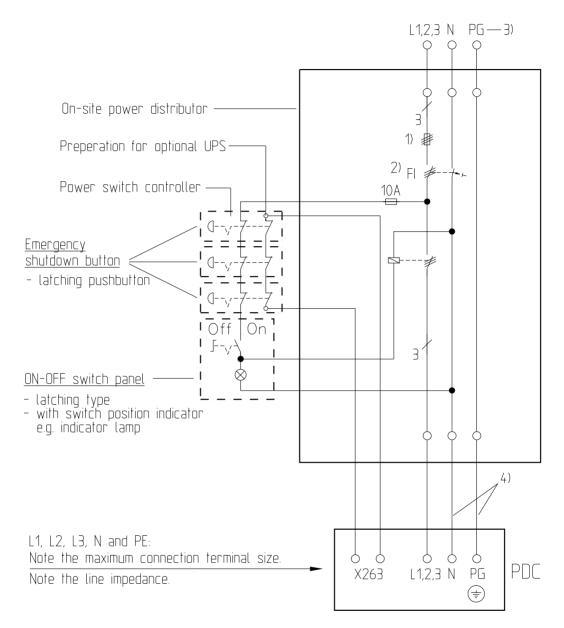
Power line cabling to the PDC

Following connector terminal sizes are available for the power line cable:

Cable	Size of connector terminal		Comments		
	mm ²	AWG			
L1, L2, L3, N, PE	25 to 95	4 to 3/0	on principle		
N, PE	16	6	Adapter terminal 16 mm ² / AWG 6 is available		

Proposal for on-site power distributor

Fuses and a main system switch <u>must</u> be in the **on-site** CT power supply as suggested in the following proposal.



- 1) line fuses.
- 2) ground-fault detector switch.
- 3) may not be connected via surge protectors.
- 4) wire size of N and PG can be 1/2 of L1, L2, L3, however min. 16 mm² /AWG 6, according IEC60439-1

Measuring the internal line impedance

Measurement device: Internal line impedance meter

e.g., No. 84 28 104 RE999 (SIEMENS Med) or CA6115N (Chauvin Arnoux).

Measurement:

Between the phases.

Values **including** the impedance of the line cable from on-site line voltage distribution cabinet to voltage input of the CT system.

Line conditioner

In general, a line conditioner is **not allowed**.

On-site voltage supply for IES and components

The line voltage connection of the IES and its components is made at an

- on-site commercial wall or floor socket or at the
- optional UPS.
 - For the line voltage connection of the **UPS** to an on-site commercial wall or floor socket, see "**IES Connection Diagram**" on page 3 7.
 - Located preferably on the IES tower.

Technical requirements

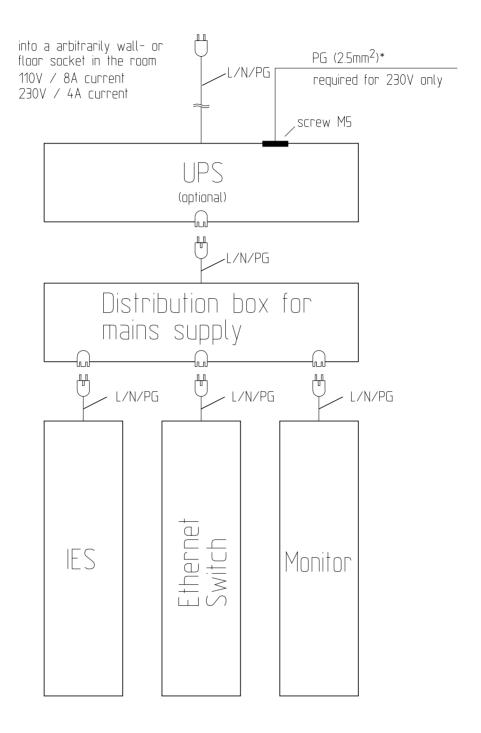
Line Voltage [V]	On-site fuses [A]	Current consumption [A]
110	20	8
230	16	4

NOTICE

For connection to 230 V, the UPS must be a grounded permanent connection with an on-site ground connection (2.5 mm²) at the ground terminal (M5 screw at the UPS).

The ground connection must be in place before the UPS is connected to the power supply.

IES Connection Diagram



Cable ducts

General requirements

- The laying of system and line power cable must be carried out in strict adherence to the applicable **national regulations**.
- According to IEC and UL, cable protection is required. All cable must, therefore, be routed in on-site cable ducts.
 - We recommend that cables ducts be installed preferably **in** the floor.
- When installing the cable ducts, you must take into account the minimum bend radiuses for the cables and water hoses.

Cable duct dimensions

The minimum size for cable ducts is

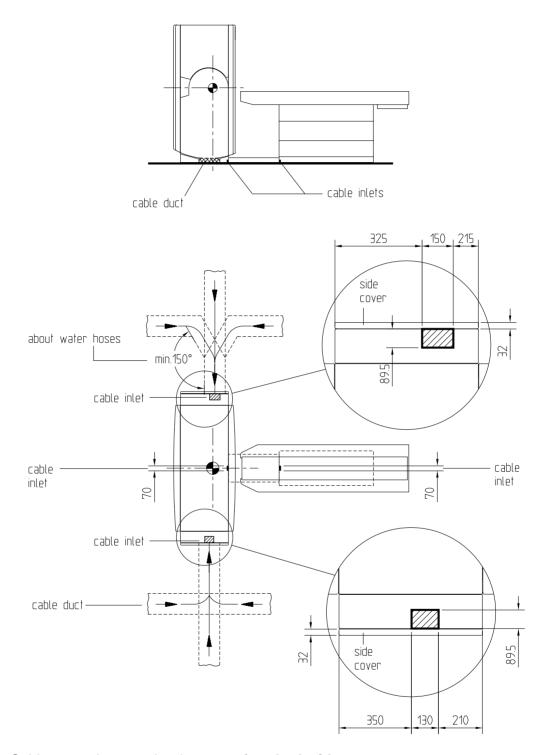
- for all rectangular cable ducts
 - 200 x 50 mm.
- · when using conduits
 - 1 1/2" to 3" (inner diameter). See "Cabling in conduits" on page 4 - 8.

Floor outlets and wall distances

Overview of floor outlets required

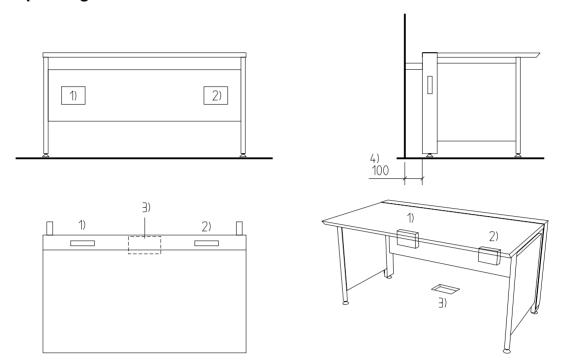
Component	Size of the opening [mm]
Gantry with patient table	Right base: 150 x 89.5; Left base: 130 x 89.5
	No opening necessary under the patient table. The connection piece contains a cable duct for cables between the gantry and the patient table.
Operating console	120 x 80
ICS and IES	Cables are routed via the opening for the operating console
IRS	2 inlets: 60 x 75
PDC	840 x 100
Cooling system water/water	840 x 100
Cooling system water/air	840 x 100

Gantry with patient table



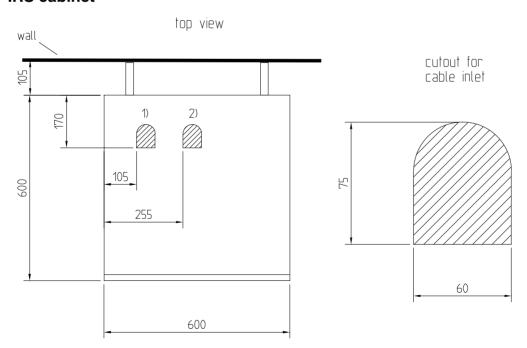
- Cables **must** be routed to the gantry from **both sides**.
 - See "System Connections" on page 4 1.
- When routing cables on the floor, cutouts have to be made in the side covers for the cables and hoses.
- The connection piece between the gantry and the patient table contains a cable duct for routing cables between the two units.

Operating console and IMS



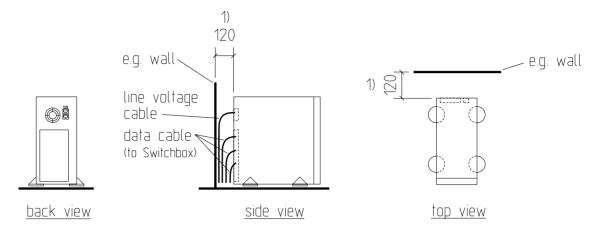
- 1) and 2) switch Box and power distributor (connector strip); alternatively on the left or right side of the back wall of the operating console
- 3) floor outlet for cabling
- distance to the wall; for cabling; exhaust air of ICS and IES (specifically with container)

IRS cabinet



- 1) cable inlet for mains cable
- 2) cable inlet for signal and data cable

ICS and IES

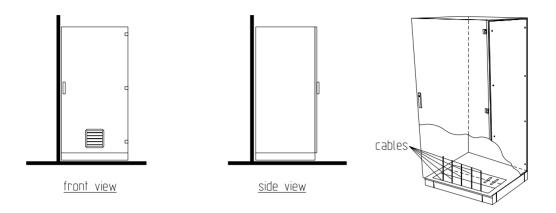


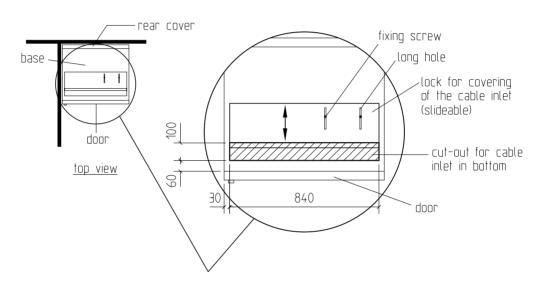
- 1) for exhaust air and cable routing
- The cables should be routed via the cable duct in the operating console.

NOTE

A distance of at least 120 mm between the back of the image system/optional container and the wall must be maintained for proper cooling and cable routing.

PDC cabinet





• Cables on the floor must be routed through the base of the cabinet. Cables may be routed from the front or the sides.

Connection of the water/water cooling system

The on-site connections can be made alternatively via a **permanent pipe** or **flexible** water hoses.

NOTE

We strongly recommend using flexible water hoses. They are easier to use and allow installation and upgrades to be performed much faster.

In principle, the gantry cooling circuit must be connected with the flexible water hoses provided.

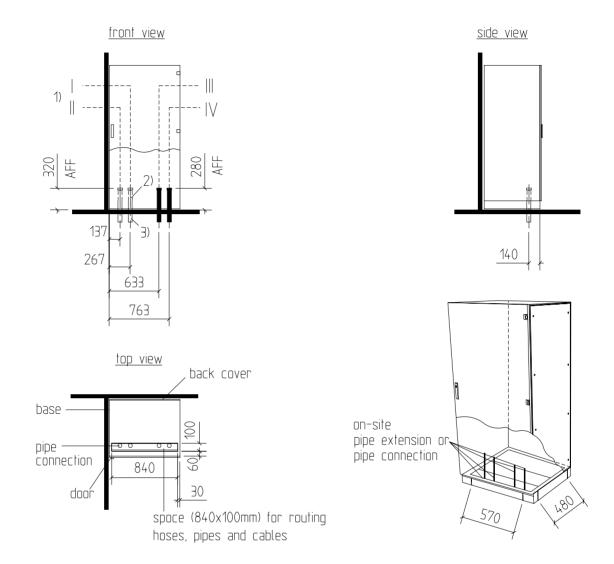
Flexible water hoses

- 2 pieces of water hoses for the primary water connection are delivered with the system.
 - **Location:** rolled up within the heat exchanger. (heat exchanger side already permanently installed).
 - Length: 5 m
 - Outer diameter: 40 mm
 - Minimum acceptable bending radius: 150 mm
 - Shorten excess cable lengths.
- Adapters CEL DN25 / R 1 1/4" NPT VA and DKOL DN25VA, clamp set and installation instructions for the on-site water connection are delivered with the system.
 - Location: packed with the heat exchanger.



- · Measures for outlet.
 - See drawing
 - "On-site pipe extensions Floor outlets and distances" on page 3 14.
- Hoses on the floor must be routed through the base of the cabinet.
 Hoses may be routed from all sides.

On-site pipe extensions - Floor outlets and distances



Notes to the drawing:

AFF = above finished floor

I = Water return on-site (primary circuit)

II = Water **inlet** on-site (primary circuit)

III = Water **return** from the gantry (secondary circuit)

IV = Water **inlet** to the gantry (secondary circuit)

- 1) The cooling system must be moved over on-site pipes I and II with a forklift at the installation site. For this reason, the on-site pipes may not extend beyond the finished floor to allow the cooling system to be moved in. Once the cabinets are installed, pipes I and II must be extended to 320 mm above the finished floor (AFF) to reach the connection in the cabinet.
- 2) On-site pipe extension for I and II.
- On-site pipe connection for I and II.

On-site installation of water connections

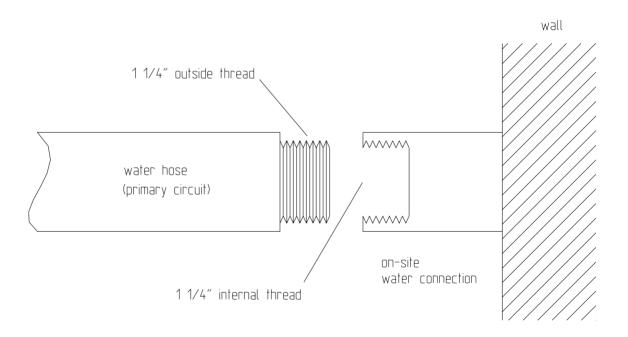
- I water return via M36 x 2 internal thread to the cooling system.1)
- II water inlet via M36 x 2 internal thread to the cooling system.1)
- 28 mm external diameter, 1.0 ... 1.5 mm wall thickness, Connect to the cooling system with M36 x 2 thread cutting screws.
- 1) I, II see drawing

"On-site pipe extensions - Floor outlets and distances" on page 3 - 14.

NOTE

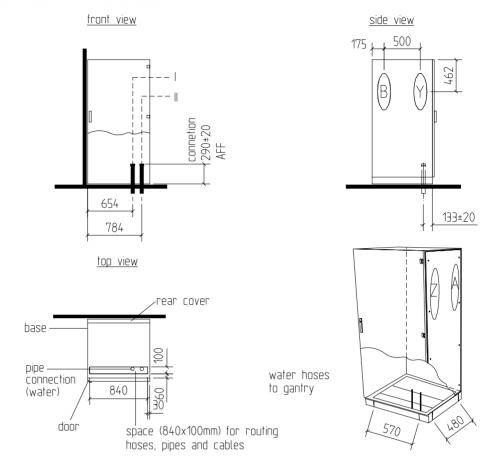
The on-site supply pipes / hoses (internal-threaded) should be directly connected via pipe extensions to the mating parts (external-threaded) in the cooling system.

Connection scheme of the on-site water connection

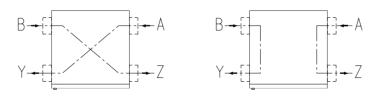


Connection of the water/air cooling system

Floor outlets and distances

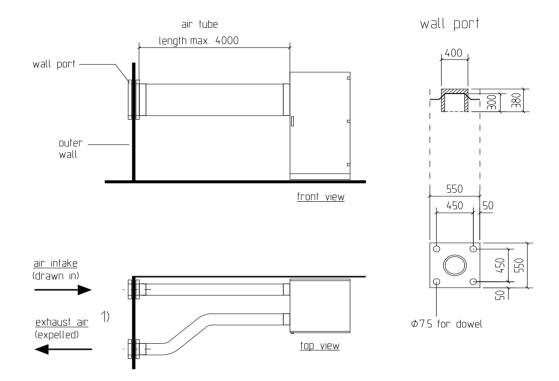


Connecting combinations for air hoses



- I Water **return** from the gantry via $1^{-1}/_{4}$ " internal thread.
- II Water **inlet** to the gantry via $1^{1}/_{4}$ " internal thread.
- **A, B** Inlet (intake) from the outside through an exterior wall or from an air conditioning room.
- Y, Z Outlet (exhaust) to the outside through an exterior wall or to the air conditioning room.
- The distance to the wall from the sides depends on the air hose connections. If air connections are not used on one side, a distance of **10 cm** is sufficient.
- To move the cabinet into the room, the front door and rear wall can be removed which reduces the depth from 900 mm to 860 mm.

On-site connection of the air hoses



- 1) Minimum distance between intake and exhaust wall ducts at least 1 m.
- The **minimum distance** between the air hose connections A and B or Z and Y on the cabinet to the wall is **1m**. The connection for the air intake (A or B) has to be removeable. **Reason:** Necessary space for installation of the air hoses and maintenance of the cooling system.
- Bending radius of the air hoses: >1 m
- Inside diameter of the air hose: 407 mm + 3mm

Shortening and extending the cooling hoses

The water hoses and air hoses for the cooling systems can be shortened and lengthened on-site.

Water hose between gantry and cooling system

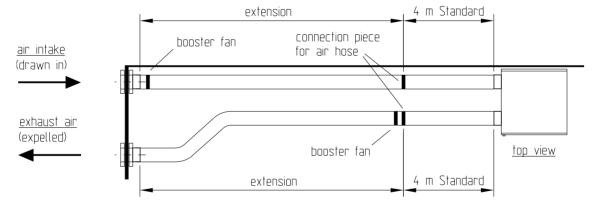
A total length of **50 m** is possible. An **additional water pump** is required at a total length of **> 30 m**.

Air hose extension

- extension with 2 additional fans (booster fans) possible
 - Each for air intake and air exhaust
- Pressure loss per air hose is 5 pa/m; corresponding with 50m³/ m
- Formula to calculate the additional fan: power of the additional fan = standard air flow rate $[m^3]$ + (extension length [m] x 50 m^3)
- Example for 50Hz:
 - Required air flow rate at 50 Hz: 4000m³
 - Planned extension: 10 m
 - Calculation:

 $10 \times 50 \text{ m}^3 = 500 \text{ m}^3$ $4000 \text{ m}^3 + 500 \text{ m}^3 = 4500 \text{ m}^3$

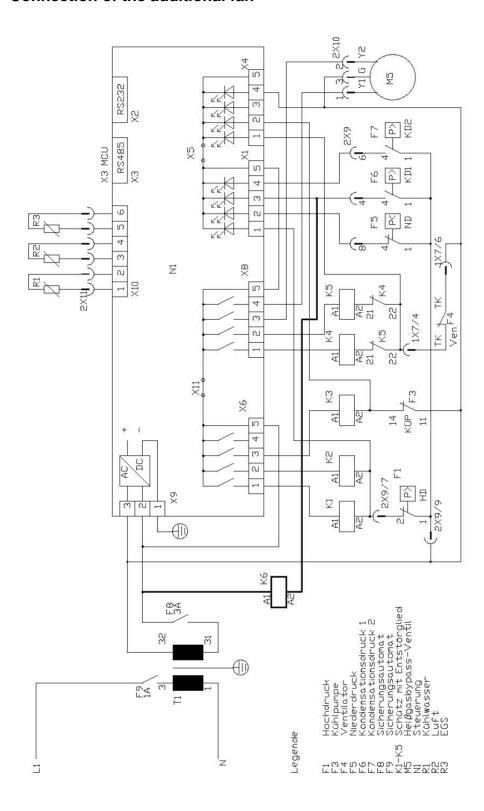
- Required power of the additional fan: 4500 m³
- Installation (example)



NOTE

- The outer diameter of the additional fan must be equivalent to the inner diameter of the air hose.
- The additional fan must switch on in parallel with the fan within the cooling system. See wiring diagram "Connection of the additional fan" on page 3 - 19.

Connection of the additional fan



K6 Relais (24 Volt / 100 mA) für Zusatzventilator

Installation of the Gantry and Patient table

Requirements of the floor for Gantry and Patient table

- The gantry and patient table may be placed or installed only on
 - concrete flooring, concrete classes B25 to B55,
 - composite flooring, or
 - access floors with suitable installation frame.
- Existing system installation frames that are fastened to concrete floors with screws are generally removed. The floor may have to be modified (level, materials).
- Gantry and patient table can be placed or installed directly on concrete floors or composite floors without an installation frame.
 - the installation support surfaces of the concrete floor or composite floors should be horizontally level.
 - Remove the existing flooring in the area of the installation support surface area and replace it with a shim of the appropriate thickness.
- Installation on access floors is possible with a suitable substructure.
- Have the load-bearing capacity of the concrete floor or the composite floor verified by an engineer.

Requirements for existing mounting frames

When replacing older SOMATOM systems, the existing mounting frames can be used as long as certain measures are carried out and specific standards are maintained. In general, however, this should be viewed as a temporary solution.

The following measures must be observed:

- The mounting frames used must be provided with cut outs, or metal plates must be welded to the frame.
- Additional steel plates must be welded to the existing frame.
 - The steel plates must be at least 10 mm thick and flush with the mounting frame.
 - Install **M12** threads in the plates for the gantry.
 - Install M8 or larger threads in the plates for the patient table.
- All remaining visible parts of the mounting frame should be appropriately covered and, if at all possible, not raised.
- Seal all additional covers to the floor (hygiene, safety).

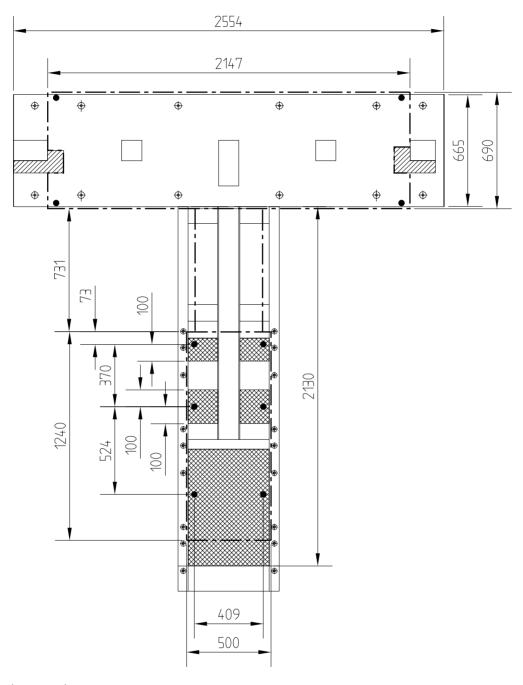
NOTICE

For safety reasons and to prevent the gantry from becoming unstable, all components of the mounting frame, especially those components welded on later, must be anchored in concrete or correspondingly secured.

NOTE

The mounting frame for SOMATOM DR 1, 2, 3 must not be used.

Dimensions of the SOMATOM CR - base (DRG, DRH)



Legend:

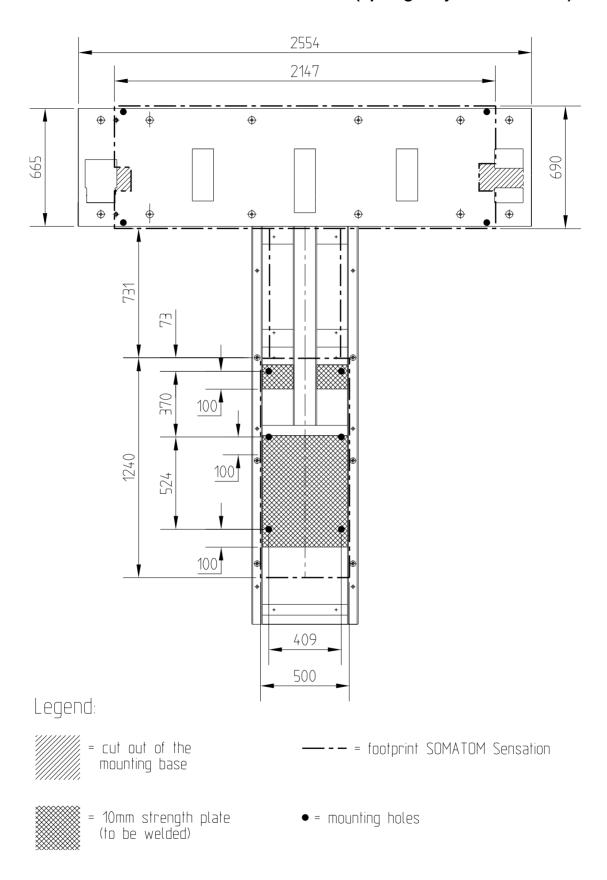


— - – = footprint SOMATOM Sensation



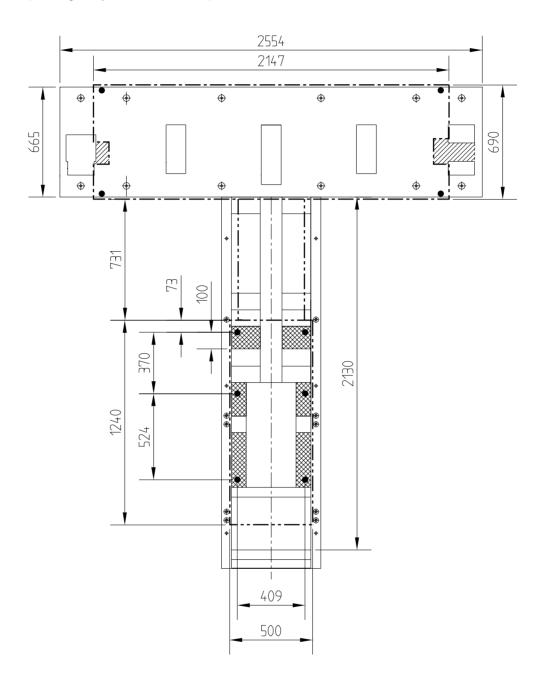
= 10mm strength plate (to be welded) • = mounting holes

Dimensions of the SOMATOM PLUS - base (up to gantry serial no. 7399)



Dimensions of the SOMATOM PLUS-S/-2/-2S/-24/-32/-40/-D, HiQ/HiQ-S/-2S-base

(as of gantry serial no. 7400)



Legend:



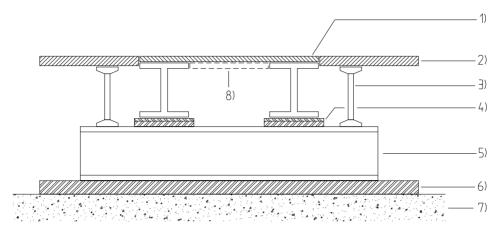
—-— = footprint SOMATOM Sensation



= 10mm strength plate (to be welded) • = mounting holes

Proposal of a subfloor construction for access floor

The following diagram illustrates the recommended subfloor construction for a access floor.



- 1) cover plate
- 2) access floor
- 3) floor supports
- 4) shims
- 5) double T-support
- 6) steel plate
- 7) concrete
- 8) reinforcement

NOTE

- A subfloor construction is required for the gantry and for the patient table.
- Gantry and patient table may not be placed directly on the plates of the access floor.
- Cut out the access floor in the area of the installation support surface for the gantry and patient table, and use suitable material (e.g. steel plates) to provide flushed and non-positive compensation.
- The subfloor construction (between gantry and concrete floor) must be made of steel only.

Information for installing the components

Installing the gantry

- The concrete floor should be completely level in the area of the gantry pedestal.
 - Permissible tolerance of **5 mm** based on the support surface of the gantry.
 - The gantry rests on the adjustable feet.
 - Leveling is done with the adjustable feet.
- The connection piece between gantry and patient table must be mounted at the gantry pedestal, respective at the patient table pedestal and needs no on-site preparation.
- Bolting the gantry to the floor, e.g. with anchors, is necessary only if required by the applicable national regulations, e.g., in those countries prone to earthquakes.
 - Bolt the gantry to the floor using anchors through the adjustable feet.
 - Installation material must be supplied on-site.
 - The material used for attaching the gantry to the exising mounting frame **must be** supplied on-site.

Installing the patient table

- The concrete floor should be level in the area of the table pedestal.
 - Permissible tolerance of **3 mm** based on the length of the table pedestal.
 - Shims are included with the delivery.
- The patient table must always be secured to the floor.
 - Secure the table to the floor by bolting through the attachment points in the table pedestal.
- The extraction force at the two most loaded attachment points is **870 N** at maximal table feed and loaded with 200 kg.
 - In compliance with IEC 60601-1, the 4-fold safety factor must be observed.
 - See
 - "Dimensions for securing the gantry with patient table to the floor" on page 3 26.
- A drilling template and all installation materials for performing the installation on a concrete floor are included with the delivery.

Anchor: Liebig super plus, undercut anchor, part no.: 70 56 484 F1102. **Drill:** SDS-Plus drill, part no.: 56 54 780.

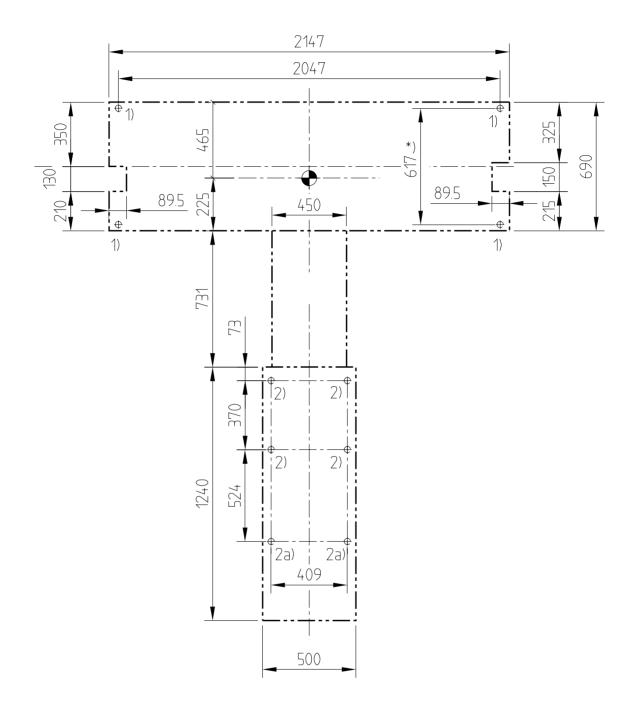
 The material used for attaching the patient table to the exising mounting frame must be supplied on-site. The extraction force and requirements regarding the mounting frame must be observed unconditionally.

NOTE

The gantry and patient table must be level.

Have the concrete floor inspected by a stress analyst.

Dimensions for securing the gantry with patient table to the floor

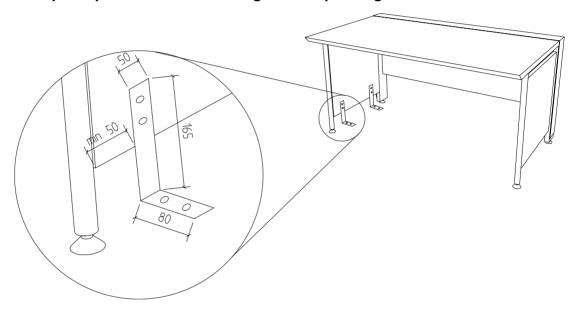


- 1) Drill 4 x holes (d = 22 mm) through the adjustable feet to secure the gantry to the floor
- 2) Drill $6 \times \text{holes}(d = 20 \text{ mm})$ to secure the patient table to the floor
- 2a) Maximal possible extraction force at these fixing points is 870 N under full load
- *) Existing bore holes with old measured distance of 624 mm can be used further

Installation of the system furniture

- It is not necessary to bolt the system furniture to the floor unless required by **local or national regulations**, e.g., or in areas prone to earthquakes.
- The customer is responsible for providing the necessary materials (anchors, washers, screws, angle brackets, etc.).
- It is not necessary to bolt down monitors and keyboards unless required by **local or national regulations**, e.g., or in areas prone to earthquakes.
- The floor must be even and level.

Example of possible floor mounting for the operating console



Installation of the ICS and IES

- Securing the PC towers the floor is necessary only when required by **local or national regulations**, for example, in countries that are prone to earthquakes.
- The customer is responsible for providing the necessary materials (anchors, washers, screws, etc.).
- The floor must be even and level.

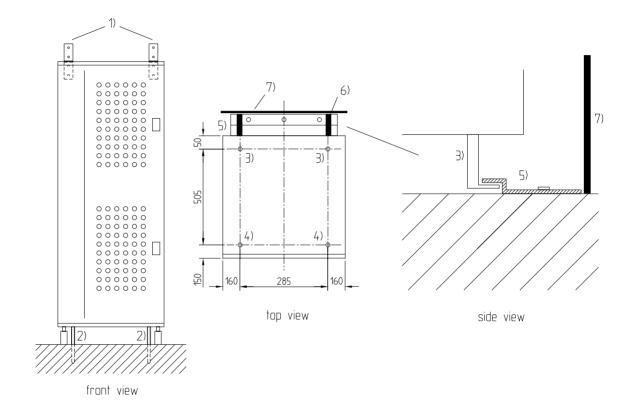
Installation of the Controlbox

NOTE

For clear access to the emergency-stop button of the control box, the distance between the control box and the keyboard (operator) should not exceed 2 m.

Installation of the IRS cabinet

- To guarantee the tilt safety according IEC and UL, the IRS cabinet must be **firmly** secured to the floor **or** to the wall.
- Holding brackets are supplied with the system.
- The floor must be even and level.
- In zones **prone to earthquakes** you must follow the **local or national regulations** and secure additionally.
- For more info about installing the IRS cabinet, refer to the "Installation Instructions".

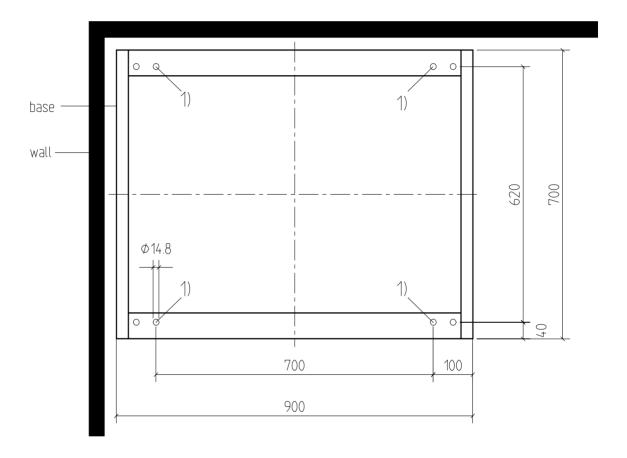


- 1) Holding bracket (L-bracket) for securing to the wall. Mount it down or up alternatively
- 2) Spacer for mounting front side
- 3) Spacer for holding bracket (Z-bracket) rear side
- 4) Drilling for 2
- 5) Z-bracket
- 6) Wall spacer (mounted on the cabinet)
- **7)** Wall
- 8) Reinforcement

Installation of the PDC and the water/water cooling system

The dimensions of the PDC and the water/water cooling system are identical.

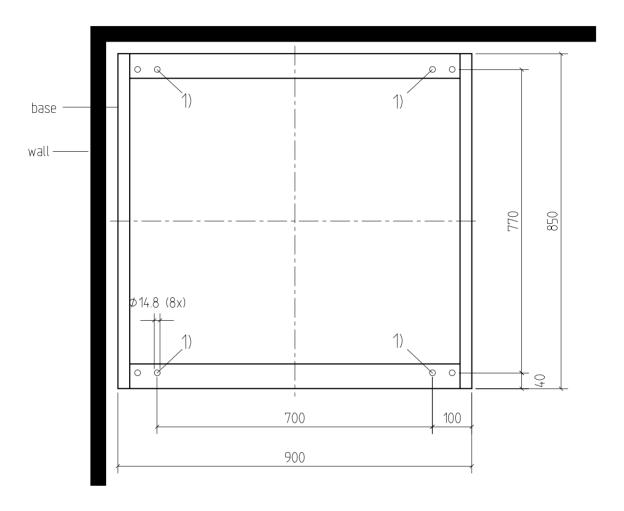
- It is not necessary to bolt the operating console to the floor unless required by **local or national regulations**, e.g., or in areas prone to earthquakes.
- The floor must be even and level.
- Holes for mounting screws have been provided.
- Mounting materials must be supplied on-site.



1) If floor mounting is required, we recommend using the holes indicated for securing to the floor.

Installation of the water/air cooling system

- It is not necessary to bolt the operating console to the floor unless required by **local or national regulations**, e.g., or in areas prone to earthquakes.
- The floor must be even and level.
- Holes for mounting screws have been provided.
- Mounting materials must be supplied on-site.



1) If floor mounting is required, we recommend using the holes indicated for securing to the floor.

Safety Information

Routing UDC-power cable

NOTE

Cable W3 must be ordered or shortened to the required length and must not be rolled up.

About

- · overheating,
- EMC.

General information

Information on routing fiber optic cables

- Do not damage the cables during routing
 - Route individually if necessary.
- · Avoid soiling the ends of the cables.
- Acceptable bending radius: 50 mm.
- Acceptable tensile strength: 35 N

Information on routing signal and data cables

To prevent interference on signal and data cables, adhere to the following:

 Route separately (if possible, in 2 different cable ducts) from on-site main voltage cable, UDC power cable W2, W3 and all cables not part of the system.

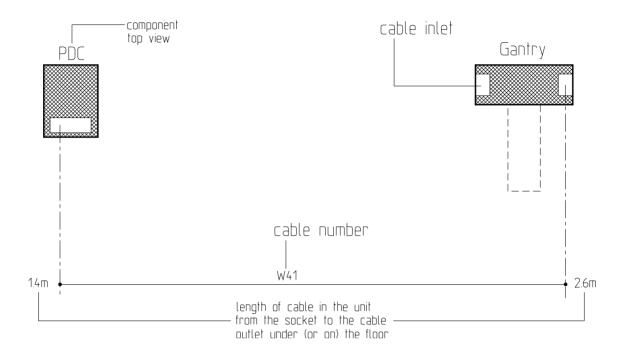
Minimum distance to

- On-site main voltage cable: 5 cm.
- UDC power cable: 15 cm.
- All cables not part of the system: >1m.
- Store excess unsecured cable. Do not roll up!
- Do not damage the cables during routing.
- Acceptable bending radius:
 - Formula: cable Ø x 10.

System sets

See "System Wiring" on page 1 - 2 in paragraph "Preliminary orders" on page 1 - 2.

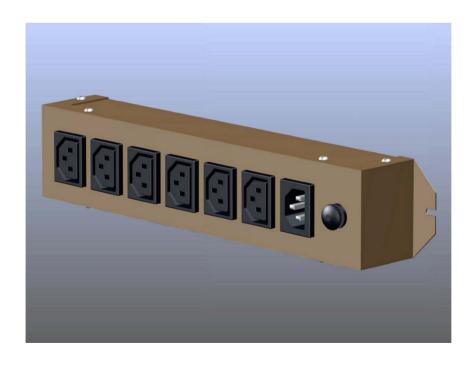
Legend for wiring



Grouping for cable numbers

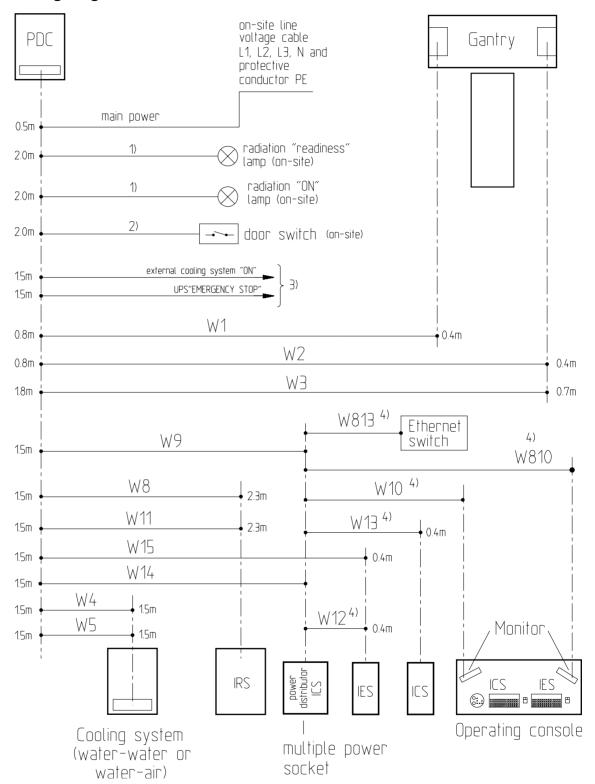
Cable number	Name
W1 to W49	Mains and protective conductor cables
W50 to W99	Data cable

Illustration: Multiple power socket



Mains and protective conductor connections

Wiring diagram



- 1) to 3) For these footnotes, see "Table of wiring diagrams" on page 4 4.
- 4) Direct connections that are not routed via the on-site cable ducts.

Table of wiring diagrams

No.	Type of cable/ Function	Supplied length	Comments			
W1	Mains cable	16 m / 25 m	-			
W2	Protective conductor	length depends upon the order	Route W2 and W3 together in the one cal			
W3	UDC power cable	length depends upon the order	duct.			
W4	Mains cable	25 m / 50 m	Doute MA and ME together in the one cold			
W5	Protective conductor	25 m / 50 m	Route W4 and W5 together in the one cable duct.			
W8	Mains cable	16 m / 25 m				
W9	Mains cable	16 m / 25 m	with plug.			
W10	AC power cord	3 m				
W11	Protective conductor	16 m / 25 m	-			
W12	Protective conductor	3 m	-			
W13	AC power cord	3 m	with plug.			
W14	Protective conductor	16 m / 25 m	-			
W15	Mains cable	16 m / 25 m	-			
W813	AC power cord	3 m	-			
W810	AC power cord	3 m	-			
1)	Control cable	length	On-site cable for connecting the non-referenced relay contact (230V / 5A ~ AC or 24 V / 2 A DC) in PDC.			
2)	Control cable	depends upon the on-site	On-site cable for connecting the door switch.			
3)	Control cables	conditions	On-site cable for connecting the non-referenced relay contact (230 V / 2A ~ AC, 24 V / 2A DC) in PDC.			

1 to 3) For these footnotes, see "Wiring diagram" on page 4 - 3.

Control and data transmission cables

Wiring diagrams

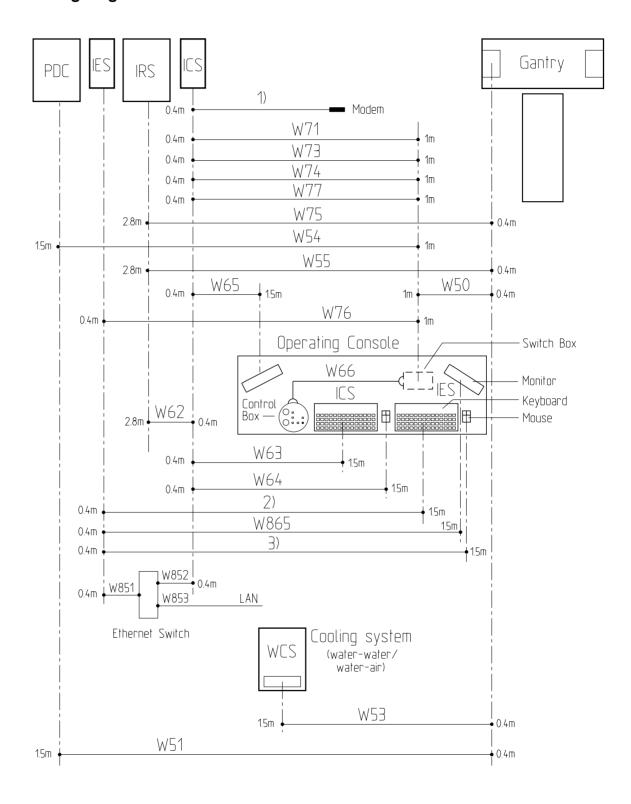
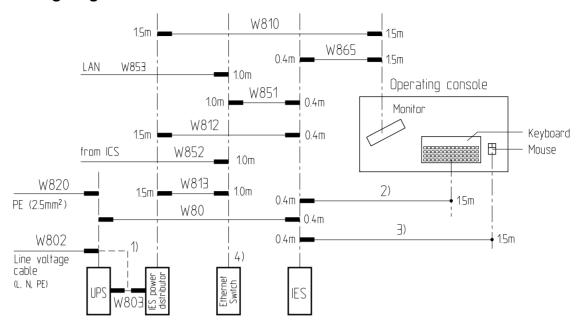


Table of wiring diagram

No.	Type of cable/ Function	Supplied length	Comments	
W50	Data cable	16 m / 25 m	-	
W51	Data cable	16 m / 25 m	-	
W53	Data cable	10 m/ 20 m/ 30 m	-	
W54	Data cable	16 m / 25 m	-	
W55	Data cable	30 m	Fiber optic cable.	
W62	Data cable	30 m	-	
W63	Keyboard cable	2 m (4 m)	Alternatively 2 m (delivered with the keyboard) or 4 m (supplied with the system).	
W64	Mouse cable	2 m (3 m)	Alternatively 2 m (delivered with the mouse), 3 m for extension (supplied with the system).	
W65	Video cable	3 m	BNC cable, 75 Ω .	
W66	Data cable	2.5 m	-	
W71	Data cable	1.5 m	-	
W73	Data cable	1.5 m	-	
W74	Data cable	1.5 m	-	
W75	Data cable	25 m	-	
W76	Data cable	1.5 m	cable only required if IES (1st Wizard) is power supplied by PDC; control signals UPS in PDC.	
W77	Data cable	1.5 m	-	
1)	Data cable	-	possibility to connect a MODEM; MODEM cable must be provided on-site.	
2)	Keyboard cable	2 m (4 m)	Alternatively 2 m (delivered with the keyboard) or 4 m (supplied with the system).	
3)	Mouse cable	2 m (3 m)	Alternatively 2 m (delivered with the mouse), 3 m for extension (supplied with the system).	
W851	Ethernet cable	5 m	Ethernet switch => IES.	
W852	Ethernet cable	5 m	Ethernet switch => ICS; can be extended on-site. *)	
W853	Ethernet cable	5 m	Ethernet switch => LAN / hospital data network.	
W865	Video cable	3 m	IES => IES monitor, BNC cable, 75 Ω .	

*) See "Increase the distance between ICS and IES" on page 4 - 8.

Wiring diagram for 2nd wizard / On-site connection for 1st Wizard



No.	Cable type/ function	Delivered length	Comment	
W80	Data cable	1 m	do not install W76.	
W802	Power cable	230V = 2 m 120V = 3 m	included in delivery volume of the UPS	
W803	Power cable	230V = 2 m 120V = 3 m	-	
W810	Power cable	3 m	-	
W812	Power cable	3 m	-	
W813	Power cable	3 m	-	
W820	Ground cable	-	Additional permanent PE connection of 2.5 mm ² between the PE connection of the UPS (M5 screw) and the on-site PE connection clamp at 230 Volt.	
W851	Data cable	5 m	-	
W852	Data cable	5 m	-	
W853	On-site data cable	-	on-site cable; see "Camera" on page 1 - 12.	
W865	Video cable	3 m	BNC cable 70 Ohm.	
1)	Connection with	out UPS; W80) not needed.	
2)	Keyboard cable	2 m / 4 m	either 2 m (delivered with the keyboard) or 4 m (part of the system).	
3)	Mouse cable	2 m / 3m	2 m (delivered with the mouse) or 3 m for extersion (part of the system).	
4)	Ethernet switch	-	available from 1st Wizard.	

Increase the distance between ICS and IES

The installation of an **on-site** Ethernet cable allows you to increase the distance between the ICS and IES, up to a distance of

- maximum 100 m.
- Specifications:
 - Ethernet cable, 100 base-TX, "shielded, twisted pair," category 5.
- Steps:
 - Replace the delivered Ethernet cable W852 (5 m) with the above mentioned on-site cable (max. 100 m).
- For **UPS 230 Volt** only, if present:
 - Either connect the supplied line voltage cable with grounded plug W802 and the additional on-site 2.5 mm² protective conductor to the grounding bolts of the UPS, or
 - remove the grounded plug of the UPS line voltage cable and connect to an on-site fixed line voltage connection, e.g., junction box.
 Ensure in-phase connection!

Cabling in conduits

The matrix shows you the minimum inner diameter when routing the cables in conduits:

	Left gan- try stand	Right gan- try stand	PDC	Generator (PDC)	Heat exchanger	IRS	ICS/IES/ console
Left gantry stand	-	-	2" 3)	-	1 1/2" 4)	2" 6)	2" 8)
Right gan- try stand	-	-	-	3" 2)	2 x 2 1/2" 1)	-	-
PDC	2" 3)	-	-	-	1 1/2" 5)	2 x 2 1/2" 7)	2 x 2 1/2" 9)
Generator (PDC)	-	3" 2)	-	-	-	-	-
Heat exchanger	1 1/2" 4)	2 x 2 1/2" 1)	1 1/2" 5)	-	-	-	-
IRS	2" 6)	-	2 x 2 1/2" 7)	-	-	-	2 1/2" 10)
ICS / IES, console	2" 8)	-	2 x 2 1/2" 9)	-	-	2 1/2" 10)	-

- 1) 2 x Wasserschläuche
- **2)** W2, W3
- 3) W1, W51
- **4)** W53
- **5)** W4, W5

- **6)** W55, W75
- **7)** W8, W11
- **8)** W50
- **9)** W9, W14, W15, W54
- **10)** W62

Dimensions, weights, noise levels, heat dissipations

Overview

Component Dimensions L x W x H [mm]		Weight [kg]	Noise level [dB (A)]	Air flow [m³/h]	Heat dissipation 1)
	net <gross></gross>	net <gross></gross>	at 1 m distance		
Gantry	2280 x 940 x 1983 <2510 x 1090 x 2265>	≤ 2000 <≤2260>	< 68	50 3)	1.38
Patient table	2434 x 674 x 550 <2590 x 875 x1145>	500 <700>	< 6020	-	0.15
PDC cabinet	750 x 900 x 1800 <990 x 1060 x 2215>	550 <635>	≤ 60	200	1.2
Operating console (optional)	1400 x 800 x 700 <1420 x 780 x 200>	< 60 <73>	-	-	-
Container (optional)	660 x 858 x 700 <1200 x 800 x 950>	58 <78>	-	-	-
IRS cabinet	600 x 600 x 1540 < 880 x 810 x 1690>	120 <130>	< 55	< 500	1.4
ICS Tower PC	2)	2)	< 50	-	0.5
IES Tower PC	2)	2)	< 50	-	0.28
Monitor 18" flat screen	465 x 120 x 430 <630 x 410 x 620>	10 <14>	-	-	0.07
Cooling system (water - water)	750 x 900 x 1800 <990 x 1060 x 2215>	< 200 <285>	< 60	-	0.5 (up to 15 to water)
Cooling system (water - air)	900 x 900 x 1800 <990 x 1060 x 2215>	< 400 <485>	< 65	-	0.75 (up to 26 to waste air)

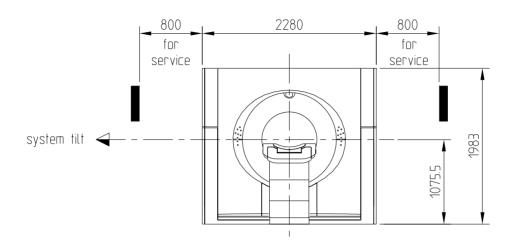
NOTE

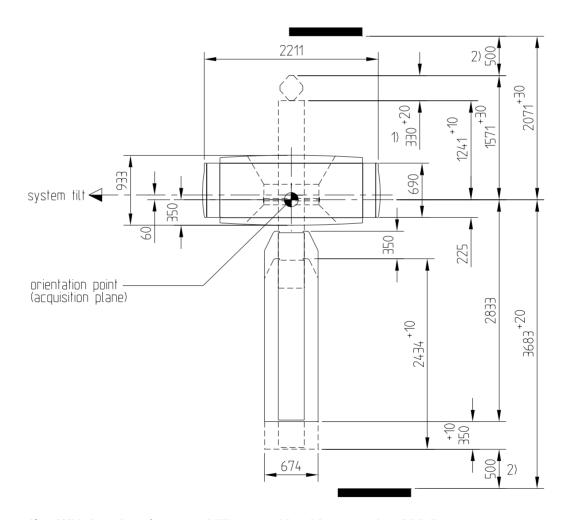
Slight deviations in the parameters are possible. When the relative humidity is < 30% at 24° C, heat dissipation in the gantry decreases by an additional 0.6 kW.

- 1) Average heat dissipation values at 24°C to the surrounding area in kJ/h at 4 kW average tube output and with a dehumidifier running.
- no information available; models subject to frequent change (commercial components).
- 3) dehumidifier.

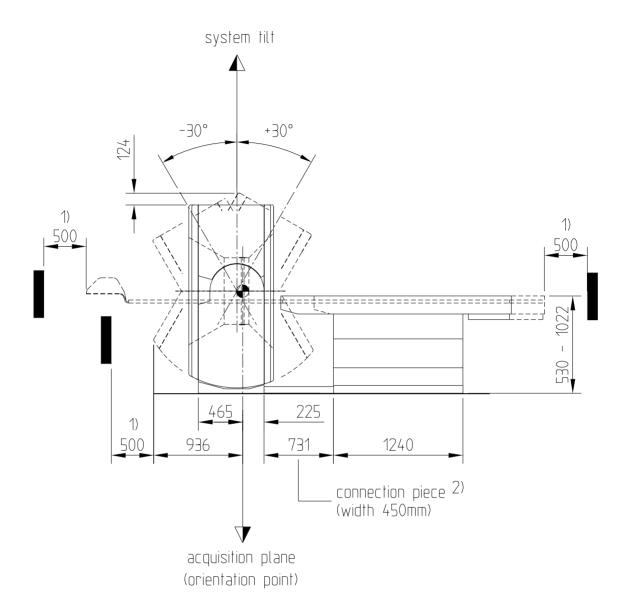
Dimension of the components

Gantry with patient table



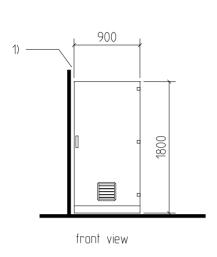


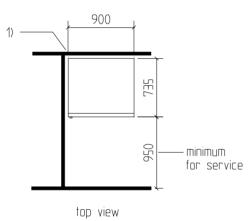
- 1) With headrest/armrest 357 mm; with table extension 336.5 mm.
- 2) Maintain this distance according to the German system safety law, e.g., to a wall.

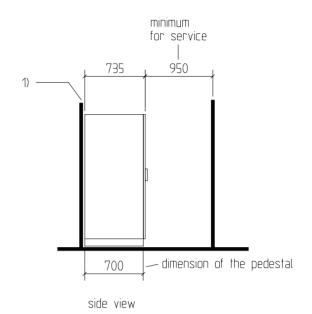


- 1) Maintain this distance according to the German system safety law, e.g., to a wall.
- 2) There is a channel in the connecting piece for routing the cable connection from the imaging system/patient table.

PDC cabinet

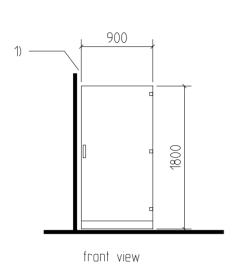


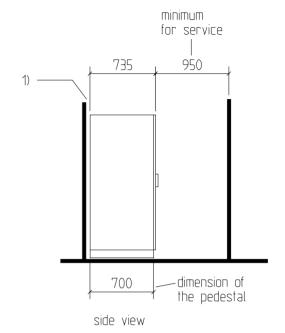


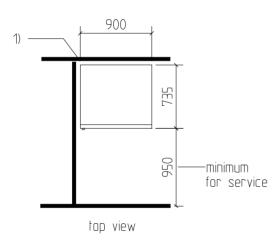


1) Distance to the wall is not required

Cooling system water / water

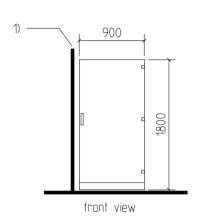


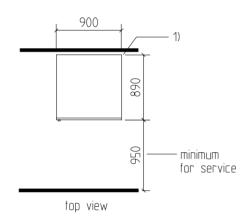


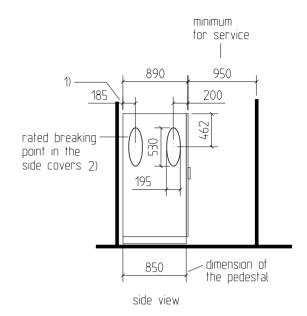


1) Distance to the wall is not required

Cooling system water / air

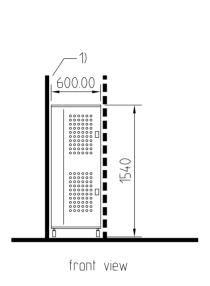


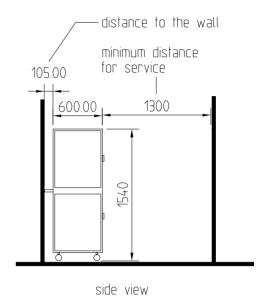


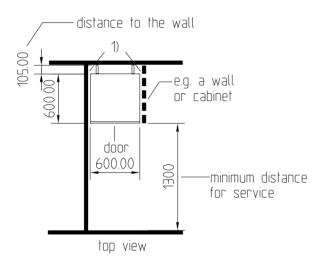


- 1) Distance to the wall is not required
- 2) For installing the connection piece

IRS cabinet







1) Distance to the wall is not required

ICS, IES and Components

No dimensions are indicated for the

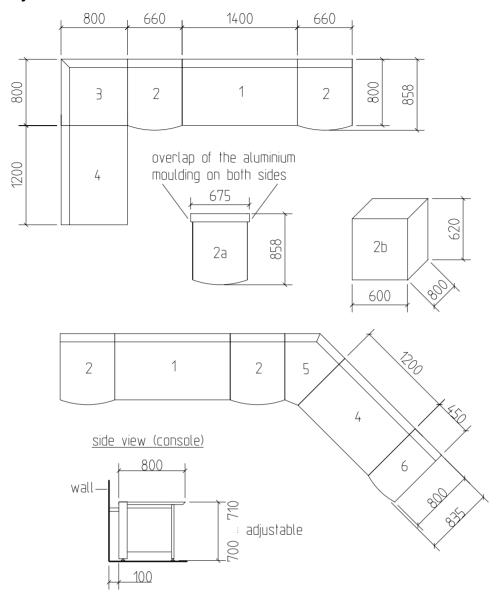
• ICS, IES, monitor, keyboard, control box and container

since the small size and pre-determined placement of the individual components makes extensive pre-planning unnecessary.

Measurements

- See "Dimensions, weights, noise levels, heat dissipations" on page 5 - 1.

System furniture



- 1 Console 1400 mm; availabe in variable or fixed size
- 2 Container
- 2a Container as stand-alone furniture
- 2b Minimum inside dimension of the container for making on-site;

 NOTE: note the uniform width of 800 mm; ensure for enough ventilation (rearside must be open, provide front side with according ventilation openings)
- 3 90° corner
- 4 Console 1200 mm; availabe in variable or fixed size
- 5 45° corner
- 6 Office container

NOTE

The container is only available in one size. Therefore, the width of the other system furniture should not be smaller or larger than 800 mm.

Mains requirements

Line voltage, line frequency, internal line impedance

Component	Line voltage [V]	Line frequency [Hz]	Internal line impedance according to IEC 60601-2-7 $[\text{m}\Omega]$
Entire system with generator	3/N~380 ±10% 3/N~400 ±10% 3/N~420 ±10% 3/N~440 ±10% 3/N~460 ±10% 3/N~480 ±10%	50/60 ± 5%	150 165 180 200 220 240

NOTE

All standard components and add-ons are supplied via the power distribution system.

Non-Siemens components, e.g., documentation cameras, film processors, etc. must not be connected to the power distribution system.

Connected load

Nominal line voltage x 125 A x 1.73

Impedance-matching transformer for the generator

The necessary impedance-matching transformer for the voltage ranges

380 V, 420 V, 440 V, 460 V and 480 V.

is factory-installed in the PDC according to customer requirements.

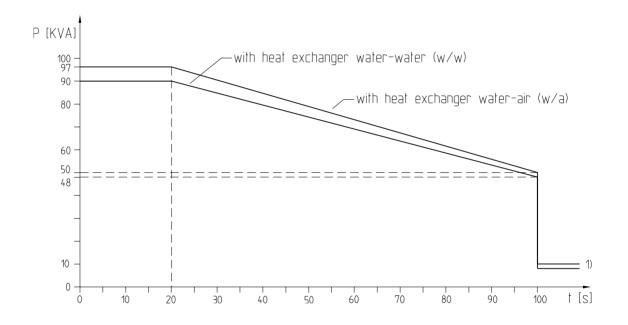
No impedance-matching transformer is required for 400 V.

NOTE

A pre-transformer is required for 200 V line voltage supply.

Power consumption for the entire system

Mode	Power consumption [kVA]			
	with heat exchanger water/water	with heat exchanger water/air		
Operating for 20 sec	90	97		
Operating for 100 sec	48	50		
Gantry OFF (EVA ON)	2	2		
Gantry ON (Stand-by) 1)	8	10		



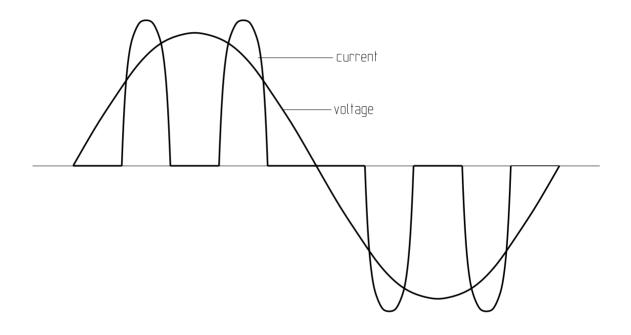
NOTE

Use a pre-transformer with min. 110 kVA nominal power if a system pre-transformer for adapting the power line is necessary.

Current per phase

$$Current_{eff} = \frac{output [kVA]}{voltage [V] x 1.73}$$

Voltage curve / current per phase



NOTE

Peak current:

350 A for the first half wave of all phases when system switched ON

In this case, a voltage stabilizer or UPS should switch to bypass mode.

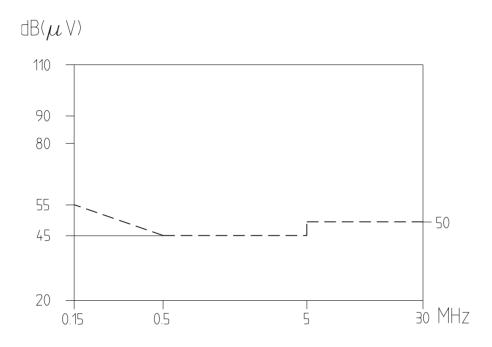
Electromagnetic compatibility (EMC)

Emission

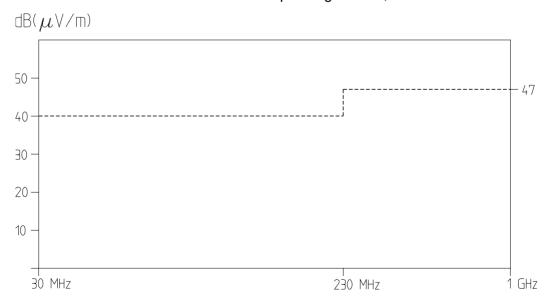
According to IEC 60601-1-2

Interference signals on power lines:

150 kHz - 30 MHz corresponding class B, CISPR 11



RF interference: 30 MHz - 1 GHz corresponding class A, CISPR 11



Magnetic field

No requirements, according to IEC 60601-1-2.

To avoid interference, the following minimum distances must be maintained:

Generator ↔ CRT monitor	min. 1 m
Gantry, Generator \leftrightarrow ECG workstation	min. 5 m 1)
Gantry, Generator ↔ EEG workstation	min. 6 m 1)

¹⁾ Minimum distance to the mains power cables = 6 m.

Interference immunity

• In accordance with IEC 601-1-2

ESD

• 3 kV for contact discharge and 8 kV for air discharge

RF interference (electromagnetic field)

3 V/m (26 MHz - 1 GHz)
 Notice: The level for a mobile phone is higher (in the vicinity of the antenna)

Magnetic field

- No requirements according to IEC 601-1-2
 - 10A/m; DC (switched); equivalent to 12.5μT
 - 1A/m_{SS}; 50/60 Hz; equivalent to $1.25\mu T_{ss}$
 - Critical component: CRT-Monitor

Voltage peaks (bursts)

• 2 kV on high-tension cables

Voltage surges

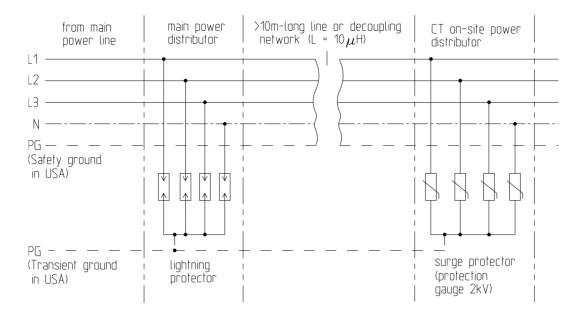
2 kV on high-tension cables

NOTE

If necessary, a surge protector with a protection level of 2 kV should be installed in the system distribution cabinet.

A lightning protector should be installed in accordance with IEC 1024-1, IEC 1024-2, and local or national regulations and safety laws.

Example



Suitable components may be obtained, e.g., from

- PHOENIX CONTACT
 - lightning protector "FLASHTRAB"
 - surge protector "VALVETRAB.MS"

or

• equivalent products from another manufacturer.



Use the specification of the manufacturer and the respective country-specific regulations to determine the required type.

Brownouts and power outages

No requirements according to IEC 60601-1-2.

Entire system without IMS

Low voltage	Maximum time
-100%	≤ 5 ms 1)
-100%	≤ 20 ms 2)
-10%	∞ 1)

1) Failure criteria 1: Scan is not restricted.

2) Failure criteria 2: Current scan is interrupted (radiation switch-off).

Control and calculation functions remain operable.

After the interference clears, scan mode is restored following

a system "CONTINUE."

NOTE

To ensure continuous operation for the entire system, a UPS must be connected for brownouts > 10 % and / or power outage > 5 min.

The UPS nominal output has to be determined according to the power consumption for the entire system.

- See "Power consumption for the entire system" on page 5 - 10.

A voltage stabilizer may be installed if the voltage drops without a subsequent power failure.

Image system IMS

We recommend using the optional UPS (Uninterrupted Power Supply) for the computer, in case voltage values deviate from the tolerances specified and performance restrictions are acceptable:

- For brownouts >10% and / or power outages > 20 ms. In addition,
 - See "UPS for IMS" on page 1 14 and
 - "UPS for IES" on page 1 14.

Local dose

The measurements were taken at the maximum slice thickness of 16x1.5 mm (24 mm) at 140 kV and 600 mAs/scan in the horizontal plane through the system axis. Phantom used: Cylindrical PMMA phantom with a diameter of 32 cm and a length of 16 cm. The phantom was positioned in the tomographic plane.

	1,50m	1,00m	0,50m	0,00m	0,50m	1,00m	1,50m
1,50m	0,0181	0,0429	0,0533	0,0577	0,0533	0,0485	0,0191
1,00m	0,0079	0,0416	0,0987	0,1269	0,1052	0,0353	0,0091
0,50m	0,0029	0,0036	0,2888	0,3184	0,2524	0,0039	0,0025
0,00m	0,0031						0,0025
0,50m	0,0149	0,0606	0,2592	0,4228	0,3022	0,0752	0,0147
1,00m	0,0464	0,0749	0,1097	0,1411	0,1135	0,0763	0,0476
1,50m	0,0330	0,0456	0,0549	0,0604	0,0560	0,0454	0,0347
2,00m	0,0248	0,0291	0,0323	0,0347	0,0319	0,0507	0,0252
2,50m	0,0179	0,0199	0,0209	0,0217	0,0211	0,0208	0,0183
3,00m	0,0136	0,0145	0,0152	0,0157	0,0152	0,0156	0,0143

Measurements in µGy/1 mAs

Color information

The following colors are used:

Shade	MED color code no.	Color similar to RAL
White textured (primary color)	4146	gray-white 9002
Metallic Bue (design ring around the gantry funnel)	not available	not available

Quick View

Components and options

Gantry

Name	Values	Comment
Dimensions [mm]	2280 x 940 x 1983	without packing
LxWxH	2510 x 1090 x 2265	with packing
Weight [kg]	≤ 2000	without packing
	≤ 2260	with packing and transport device
Noise [dB (A)]	< 68	-
Air flow [m ³ /h]	50	dehumidifier
Heat dissipation [kW]	1.38	at 24°C and 4 kW average tube output to the surrounding area
Distance for service [mm]	800	to the left and right gantry stand
Securing to the floor	not required; but possible	In countries prone to earthquakes, follow the applicable country-specific regulations

Patient table

Name	Values	Comment
Dimensions [mm]	2434 x 674 x 550	without packing
LxWxH	2590 x 875 x1145	with packing
Weight [kg]	500	without packing
	700	with packing
Noise [dB (A)]	< 60	-
Heat dissipation [kW]	0.15	at 24°C to the surrounding area
Distance for service [mm]	-	no special requirements
Extraction force [N]	870	see page 3-24
Securing to the floor	yes	has to be secured to the floor as a rule

PDC cabinet

Name	Values	Comment
Dimensions [mm]	750 x 900 x 1800	without packing
LxWxH	990 x 1060 x 2215	with packing
Weight [kg]	550	without packing
	635	with packing
Noise [dB (A)]	≤ 60	-
Air flow [m ³ /h]	200	-
Heat dissipation [kW]	1.2	to the surrounding area
Distance for service [mm]	950	door side
Securing to the floor	possible	In countries prone to earthquakes, follow the applicable country-specific regulations
Size of connection terminal	max. 35 mm ² / AWG 2	terminal for mains connection

IRS cabinet

Name	Values	Comment
Dimensions [mm]	600 x 600 x 1540	without packing
LxWxH	880 x 810 x 1690	with packing
Weight [kg]	120	without packing
	130	with packing
Noise [dB (A)]	< 55	-
Air flow [m ³ /h]	< 500	-
Heat dissipation [kW]	1,4	-
Distance for service [mm]	1300	for service on front side and rear side
Distance to the wall [mm]	105	given by the spacers
Securing	Securing to the floor or to the wall required	Additional. In countries prone to earthquakes, follow the applicable country specific regulations

ICS / IES Tower PC

Name	Values	Comment
Dimensions [mm]	-	no information available; models
LxWxH	-	subject to frequent change (commercial component)
Weight [kg]	-	,
	-	
Noise [dB (A)]	< 50	fan noise
Air flow [m ³ /h]	-	-
Heat dissipation [kW]	0.42	-
Distance to the wall [mm]	120	to back; for cooling and cabling
Securing to the floor	-	In countries prone to earthquakes, follow the applicable country-specific regulations
Line voltages	-	connection in PDC via multiple power socket

IES Tower PC (2nd Wizard)

Name	Values	Comment
Dimensions [mm] L x W x H	-	no information available; models subject to frequent change (com-
Weight [kg]	-	mercial component)
	-	
Noise [dB (A)]	< 50	fan noise
Air flow [m ³ /h]	-	-
Heat dissipation [kW]	0.28	-
Distance to the wall [mm]	120	to back; for cooling and cabling
Line voltages	110 V / 8 A	on-site fuse: 20 A ground, additional UPS
	230 V / 4 A	on-site fuse: 16 A ground, additional UPS
Securing to the floor	-	In countries prone to earthquakes, follow the applicable country-specific regulations

Monitor 18" (flat screen)

Name	Values	Comment
Dimensions [mm]	465 x 120 x 430	without packing
LxWxH	630 x 410 x 620	with packing
Weight [kg]	10	without packing
	14	with packing
Heat dissipation [kW]	0.07	1 monitor
Securing to the floor	-	In countries prone to earthquakes, follow the applicable country-specific regulations

Cooling system water / air

Name	Values	Comment
Dimensions [mm]	900 x 900 x 1800	without packing
LxWxH	990 x 1060 x 2215	with packing
Weight [kg]	< 400	without packing
	485	with packing
Noise [dB (A)]	< 65	-
Heat dissipation [kW]	0.75	to the surrounding area (air)
	up to 26	to the exhaust air
Distance for service [mm]	950	to the door side
Distance to the wall [mm]	-	not required
Air hoses	4 m	only one length available; hose for replacement 4 m available; can be shortened; minimum distances between air intake and air exhaust: 1 m; minimum bending radius: > 1m
Water hoses	10 m / 20 m / 30 m	gantry cooling circuit; 3 lengths available; can be shortened; minimum bending radius: 150 mm outer diameter: 40 mm
Air temperature[°C]	-25 to +40	air intake
Air flow [m ³ /h]	4000 at 50 Hz 4500 at 60 Hz	at 26.0 kW total power output and 40°C ambient temperature
Securing to the floor	possible	In countries prone to earthquakes, follow the applicable country-specific regulations

Cooling system water / water

Name	Values	Comment
Dimensions [mm]	750 x 900 x 1810	without packing
LxWxH	990 x 1060 x 2215	with packing
Weight [kg]	< 200	without packing
	285	with packing
Noise [dB (A)]	< 60	-
Power output [kW]	0.5	to the surrounding area (air)
	up to 15	total power output to the on-site chilled water
Distance for service [mm]	950	to door side
Distance to the wall [mm]	-	not required
Water hoses	5 m	primary circuit; 2 pieces pre- installed (in delivery volume) bending radius: 150 mm outer diameter: 40 mm
	10 m / 20 m / 30 m	gantry cooling circuit; 3 lengths available; can be shortened; bending radius: 150 mm outer diameter: 40 mm
Water temperature [°C]	2 to 16	primary circuit
Temperature gradient [K/min]	max. 0.5	-
Operating pressure [bar]	max. 10	-
Drop in pressure	see diagram	in chapter 2.
Circulating volume		
Switch off the primary water circuit	277 V / 2 A ~ 24 V / 2 A =	floating ground relay contact in PDC.
Water quality	drinking water quality	if necessary, use filter
Antifreeze agent	up to -20°C	25 % admixture; only primary circuit
Temperature difference	see formula	$\Delta t[K] = \frac{15,0x(860)}{(Flowrate)[1/h]}$
Service	The installation of ball valves is recommended for troubles- hooting. A temperature indicator for the primary and secundary circuit and a flow rate indicator is integrated in the WCS	
Pipe connection (on-site)	1 1/4"	internal thread

Static filling pressure [bar]	2 ±0.2	gantry cooling circuit
Filling volume [Liter]	50	
Water valve	3/4" (recommended)	near the system
Water drain	recommended	
Securing to the floor	possible	In countries prone to earthquakes, follow the applicable country-specific regulations

CARE Vision CT

Name	Values	Comment
Dimensions [mm] L x W x H	540 x 580 x 1140	monitor trolley
Weights [kg]	25	
	27	media interfaces and accessory (complete)
	49.5	overhead support
Anchors	HST M16/100	for unfinished ceiling installations
	HST M16/25	for intermediate ceiling installations
Extraction force [kN]	6	for unfinished and intermediate ceiling installations
Cable duct size [mm]	30 x 30	minimum
Room heights [mm]	2640 to 3210	150 mm flange tube required
	> 3210 to 3610	580 mm flange tube required
	< 2640 or > 3610	only monitor trolley allowed
	between 2725 and 2860	may not be parked above the gantry
Cable lengths [m]	17.70	line cable
(free length without	22.90	fiber optic cable
corrugated hose)	6	corrugated hose from monitor trolley

System furniture

Name	Values	Comment
Dimensions [mm]	660 x 858 x 700	for container ICS / IES
LxWxH	450 x 835 x 700	office container
	800 x 800 x 700	90° corner
	height 700; width 800	45° corner
Distance to the wall [mm]	100	to the back wall; given by the spacers on the system furnishings

All system furniture can be ordered at the furniture manufacturer in variable sizes.

Operating console

Name	Values	Comment
Dimensions [mm] L x W x H	1400 x 800 x 700 <u>or</u> 1200 x 800 x 700	without packing; Fixed and variable size available
	1420 x 780 x 200 <u>or</u> 1220 x 780 x 200	with packing
Weight [kg]	< 60	without packing
	73	with packing
Distance to the wall [mm]	100	to the back wall; given by the spacers on the system furnishings
Securing to the floor	-	In countries prone to earthquakes, follow the applicable country-specific regulations

Container (optional)

Name	Values	Comment
Dimensions (outside) [mm] L x W x H	660 x 858 x 700	without packing
	1200 x 800 x 950	with packing
Dimensions (inside) [mm] L x W x H	600 x 800 x 620	minimum inner dimensions for making on-site
Weight [kg]	58	without packing
	78	with packing
Securing to the floor	-	In countries prone to earthquakes, follow the applicable country-specific regulations
Distance to the wall [mm]	100	to the back wall; given by the spacers on the system furnishings

Electrical Data

On-site requirements

Name	Values	Comment
Line frequency [Hz]	50 / 60 ±5%	-
Line voltages [V]	3/N~380 ±10% 3/N~400 ±10% 3/N~420 ±10% 3/N~440 ±10% 3/N~460 ±10% 3/N~480 ±10%	Use a pre-transformer with 200 Volt power lines; see page 5 - 9.
Line impedance [m Ω]	150	for 380 V
	165	for 400 V
	180	for 420 V
	200	for 440 V
	220	for 460 V
	240	for 480 V
On-site fuses for	3 x 100 A NH	Type gl/gG; selectivity 1:1.25
380 V to 480 V	3 x 125 A NH	Type gl/gG; selectivity 1:1.6
Ground-fault detector switch	125 A/300 mA for 380 Volt to 420 Volt; see page 3 - 4.	e.g. Siemens, Type 5SM3 645-8 or type from another manufacturer for alternating fault currents, surgeprotected; selective, respective short-time-delayed switch off system.
	for 440 Volt to 480 Volt	ground-fault detector switch with $I_N = 30$ mA for alternating fault currents; surge-protected, corresponding to the fuse; respective short-time-delayed switch off system.
Protective conductor resistance	max. 0.1 Ω	on-site power supply to the PDC; additional PE conductor to the IMS and IES for 230 V power supply
Connected load [kVA]	nominal line voltage x external (on-site) fuse x 1.73	
Power consumption [kVA] with cooling system water/water	90	in operation (scanning) for 20 sec.
	48	in operation (scanning) for 80 sec .
	2	Gantry OFF (EVA ON)
	8	Gantry ON (Stand-by)

Power consumption [kVA] with cooling system water/air	97	in operation (scanning) for 20 sec.
	50	in operation (scanning) for 80 sec .
	2	Gantry OFF (EVA ON)
	10	Gantry ON (Stand-by)
Distances [m] (because of magnetic field)	1	PDC incl. on-site mains cable \leftrightarrow CRT monitor
	5	gantry, generator \leftrightarrow ECG workstation
	6	gantry, generator ↔ EEG workstation
Interference immunity	3 kV	for contact discharge; ESD
	8 kV	for air discharge; ESD
	3 V/m (26 MHz - 1 GHz)	RF interference (electromagnetic field)
	10 A/m equivalent: 12.5μT	magnetic field; DC (switched)
	1 A/m 1.25 μT	50/60 Hz
	2 kV on high-tension cables.	voltage peaks (burst) and voltage surges (surge)
Voltage brownouts and power outage	-100 % for ≤ 5 ms	Scan is not restricted
	-100% for ≤ 20 ms	Current measurement is terminated (radiation switch-off). Control function remains operable. After the interference clears, measurement can be continued with "CONTINUE"
	-10 % for ∞ s	Scan is not restricted

System wiring

Name	Values	Comment
Wiring kit	16 m / 25 m	system connections; 2 lengths available
	variable (measure on-site)	power cable (UDC cable W3 + ground cable W2); add 2.5 m for internal length
"Power" wiring (UDC cable)	variable	required length can be ordered free
Camera cable	5 m / 30 m	2 lengths available
Fiber optic cable for additional monitor	30 m / 120 m	2 lengths available
Bending radius [mm]	50	fiber optic cable
	cable Ø x 10	other cables
Tensile strength	35 N	fiber optic cable
Minimum distances of the signal and data cables	5 cm	to on-site line voltage cable
	15 cm	to power cable
	> 1 m	to cables not part of the system
Cable ducts dimensions	200 x 50 mm	for rectangular cable ducts
	1 1/2" to 3"	inner diameter when using conduits

Structural requirements

Room planning

Name	Values	Comment
Room height	min. 2300 mm	due to gantry; without overhead support of the CARE Vision CT option
Room volume	14.5 m ³	due to cooling system water/air
Room sizes	-	refer to room examples in chapter 2
Minimum distance to the patient	1.83 m (horizontal) ±1.25 m (vertical)	to additional CRT monitor, IMS, IES and other non-medical components
Safety distances	500 mm	to electro motor-driven components; according national regulations
Height difference [m]	±4	cooling system and gantry
Air temperature [°C]	15 to 28	for examination and operator's room
	5 to 40	for both cooling systems
	15 to 35	for PDC cabinet
Relative humidity [%]	15 to 75	for examination and operator's room
	15 to 85	for both cooling systems
	15 to 75	for PDC cabinet
Room climate (ideal)	22°C (temperature) 40 % to 60 % relative humidity	for people and system
Temperature gradient [K/h]	10	entire system without heat exchanger
Atmospheric pressure [hPA]	700 to 1060	entire system
Floor load	400 kg/plate	at access floors
Floor openings [mm]	stand right: 150 x 89.5 stand left: 130 x 89.5	gantry
	120 x 80	operating console; also cabling to IMS and IES
	840 x 100	PDC cabinet; cooling systems
Ground condition	B25 to B50	concrete class required for patient table and gantry

Technical Data 5 - 29

Transport conditions

Name	Values	Comment	
Temperature range [°C]	-20 to +50	-4°F to 122°F	
Relative humidity [K/h]	10	-	
Relative humidity [%]	10 to 90	-	
Atmospheric pressure [kPA]	70 to 105	700 mbar to 1050 mbar	
Acceleration	Maximum acceleration in accordance with DIN IEC 721, part 3, class 2M2		
Transport weights [kg] (gantry)	≤ 2217	Gantry without transport equipment	
Transport dimensions	3121	max. transport length	
[mm] (gantry)	2514	min. transport length	
(gantry)	1440	max. transport width	
	1054	min. transport width	
	1990	min. transport height	
Floor clearance [mm]	min. 7 mm	for gantry	
	24.5 mm	for patient table	
Door width [mm] (for gantry)	1080	door opening for min. 3100 mm hallway width	
	1500	door opening for 2300 mm hallway width	

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Transport instructions

General information

Ensure compliance with the following conditions to avoid damage to the system during transport:

Temperature	-20°C to +50°C (-4°F to 122°F) Refer to the following climatogram.	
Temperature gradient	10 K/h	
Relative humidity	10% to 90% relative humidity (without condensation). Refer to the following climatogram.	
Barometric pressure	70 kPa to 105 kPa (700 mbar to 1050 mbar)	
Acceleration	Maximum acceleration according to DIN IEC 721, Part 3., class 2M2.	

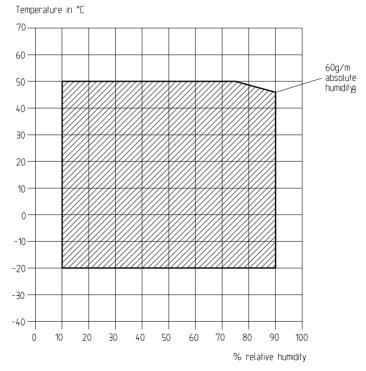
NOTE

The entire system must be transported in the transport packaging provided by the manufacturer.

A truck equipped with air shocks must be used for land transport of the system.

Temperature and relative humidity

Refer to the following climatogram for the acceptable range for temperature and relative humidity.



NOTE

These specifications assume that the CT system is free of damage and is transported in the original, undamaged packaging.

General information for moving the components on-site

- Two persons are needed to move the gantry and the patient table on-site.
- It is possible to remove the front, rear and side covers of the gantry to minimize the outer dimensions. The reduced dimensions **without** the transport device are then:
 - Length: 2185 mmWidth: 810 mm
- Given their dimensions, it is usually not difficult to move the operating console, the imaging system, the monitors, and the keyboards into the building.

Transporting the gantry

Floor load

Installation floors must be laid out to support a load of min. **400 kg/plate**. During transport of the gantry, higher loads can occur at individual points (3-point load, e.g., if the floor is not level). Cover the transport path with sheet metal to distribute the floor load.

Transport device

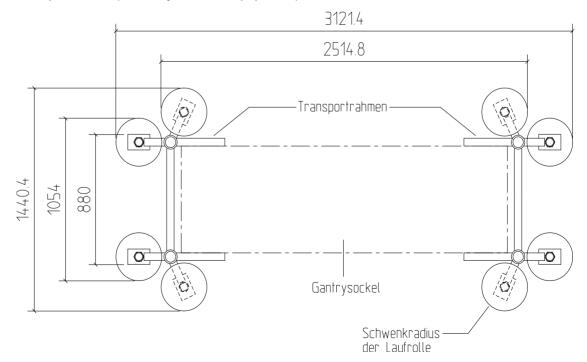
- A transport device for transporting the gantry must be ordered separately.
 - Applies to non-European countries only.

NOTE

The transport device can be used for every available CT system.

Order information:

 Transport device kit, item no. 27 92 146 K1081 Dept. CS ML (auxiliary service equipment)



Transport weights

• Gantry without transport device: ≤ 2000 kg

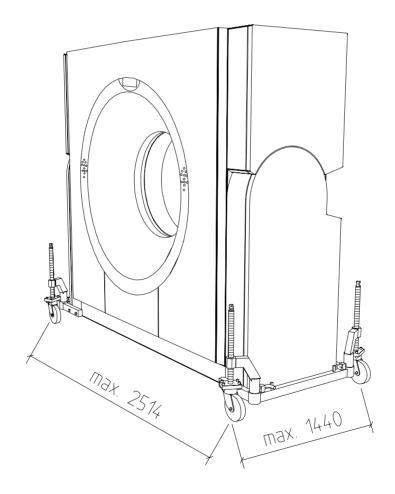
• Transport device: 117 kg.

Transport dimensions

	Transport length	Transport width	Transport height
Maximum	3121 mm	1440 mm	-
Minimum	2514 mm	1054 mm	1990 mm

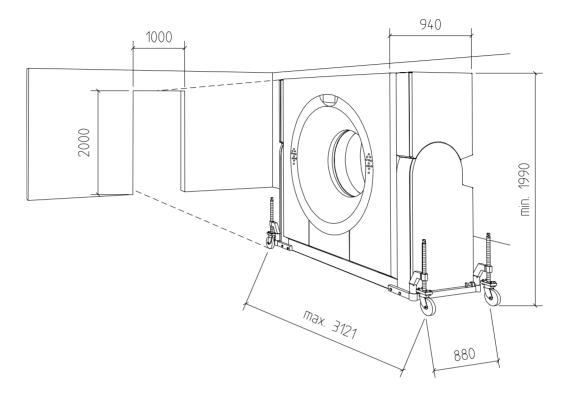
Normal transport

- Swivel out the support arms of the transport device.
- Floor clearance min. 7 mm.



Transport through narrow spaces

- Swivel in the transport arms of the transport device.
- Lower the transport device with the gantry to the lowest possible floor clearance (7 mm).



∆WARNING

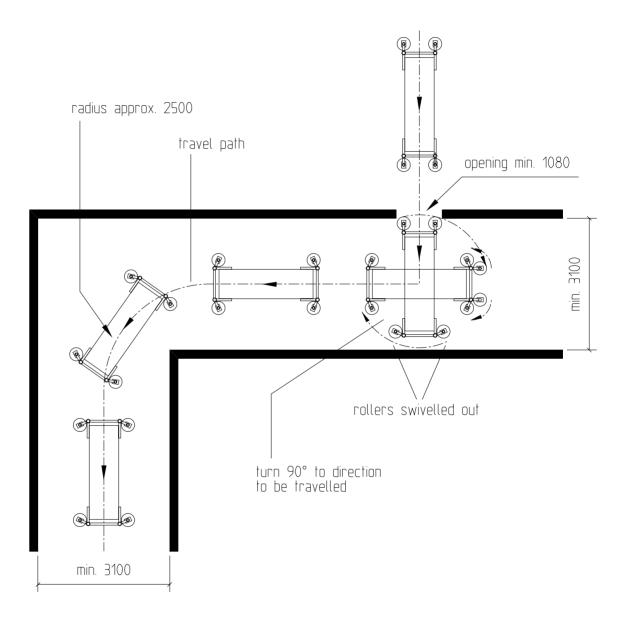
Tipping hazard!

Transport with the rollers swiveled in is permissible only when narrow places make it impossible to transport the system with the rollers swiveled out. As soon as the system has passed through narrow spaces, the transport rollers must be swiveled out again.

Transport through doors and hallways

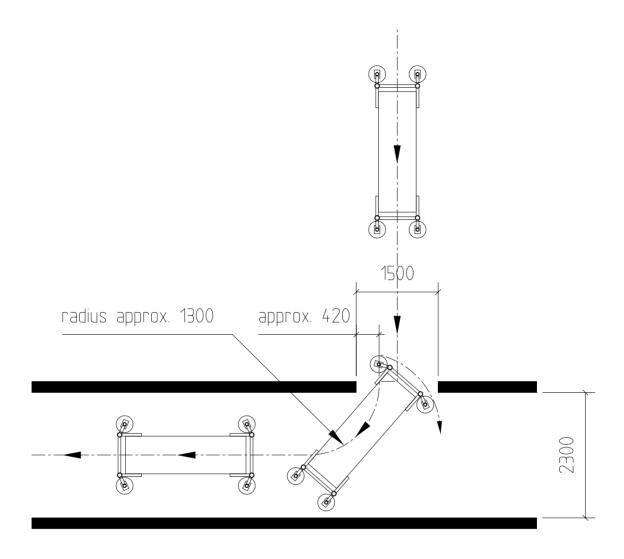
Minimum door width and minimum hallway width

The diagram illustrates the relationship between the minimum door width, the resulting minimum width of the hallway, and transport around a corner.



Minimum door width and normal hallway width

The example illustrates the relationship between a normal hallway width of 2300 mm and the resulting minimum door width.



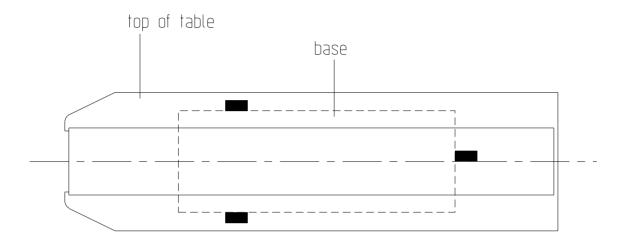
NOTE

Note the position of the transport rollers.

Transporting the patient table

Three transport rollers are installed on the bottom of the patient table. They must be removed (unscrewed) after the table is installed.

• The maximum clearance for transport is **24.5 mm**. For this reason, the transport path should be relatively smooth and level.



= transport rollers

NOTE

The transport rollers must be kept for possible future use in service activities.

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Installation preparations

Notes

NOTE

The hardware functionality is available from software version VA60.

For safety reasons, and to enable installation according to specifications, we recommend that the ceiling anchor plate be installed by specialists. Installation should be supervised by the project manager and certified by an architect or stress analyst.

NOTE

The room preparation and installation should be completed in one time block together with the service engineer so that the system upgrade only ties up the system once.

Components

The "CARE Vision CT" option consists of the following:

- Joystick, footswitch for radiation release, 18" flat screen monitor and video transmitter.
- Optionally with overhead support or monitor trolley
 - Connection kit for monitor trolley
 - Connection kit for overhead support (with fiber optic cable, video receiver, line voltage, etc.)

NOTE

The only components relevant to planning are the overhead support and the monitor trolley.

Measurements and weights

Components	Dimensions LxWxH [mm]	Weight [kg]	
18" flat screen	see "Technical Data" on page 5 - 1.		
Monitor trolley (without monitor)	540 x 580 x 1140	25	
Media interfaces and accessories (complete)	see page 7 - 4.	27	
Overhead support	see page 7 - 6.	49.5	

Overhead support

The overhead support can be mounted to the unfinished ceiling and to the ceiling construction with or without a sub-ceiling.

The overhead support is attached to a star-shaped ceiling flange.

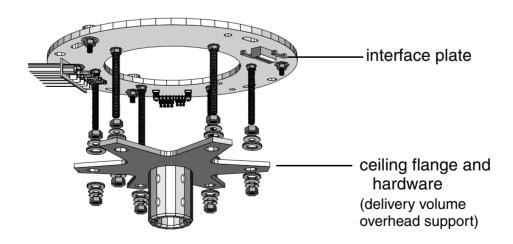
Depending on the ceiling construction and the mounting height, the room height has to be adjusted to ensure the optimal height for the overhead support.

The overhead support is centered to the gantry and then attached to the ceiling.



Definitions

- For a sub or intermediate ceiling, the **media interface plate** is mounted to the concrete ceiling in connection with the star-shaped ceiling flange. The media interface plate serves as an interface between the on-site line voltage cables, the system connections, and the overhead support.
- The star-shaped **ceiling flange** is the actual support plate and is required for mounting the overhead support to an intermediate ceiling or unfinished ceiling.



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Pre-delivery

The overhead support, including all required installation components, can be ordered in advance from

Siemens Forchheim CTL OM.

Please include the customer order number.

Required tools and auxiliary tools

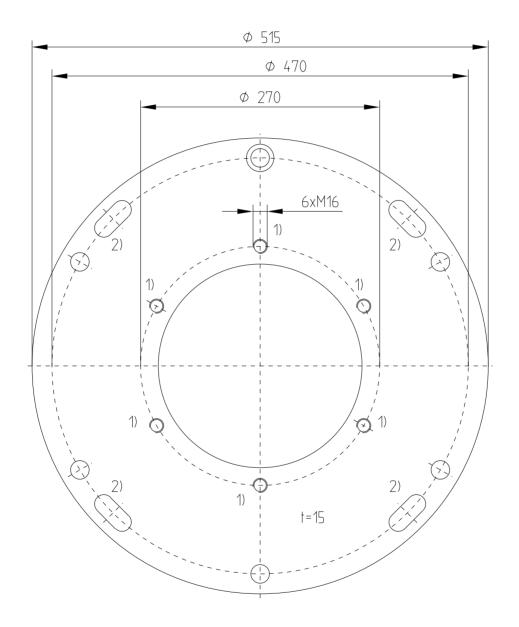
The following tools are required for the installation and must be provided on-site:

- Ladder
- Spirit level
- Torque wrenches
- Allen key set SW 24 (6 edge nut, size 24)
- Crescent wrench, size 24
- Circlip ring pliers, size A3

Media interface plate

The media interface plate is required for

- intermediate ceilings.
 - The drilling template is part of the delivery.
- Mounted to the ceiling via 4 elongated holes.
 - Ensure that you drill exactly in the center of the cross-hairs.



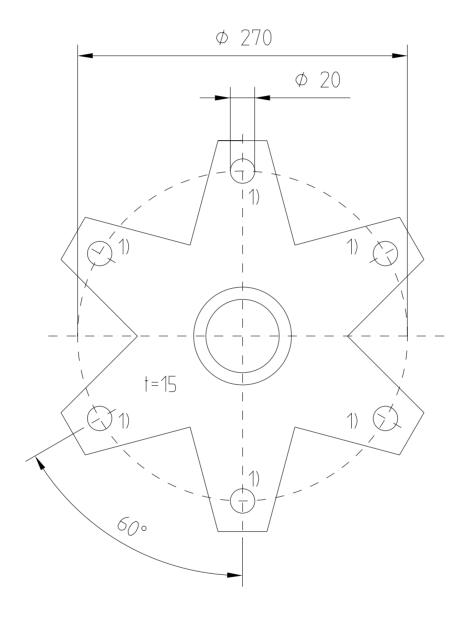
- 1) For threaded rods
- 2) For ceiling-mounted overhead support

CARE Vision CT 7 - 5

Ceiling flange

The ceiling flange is required for

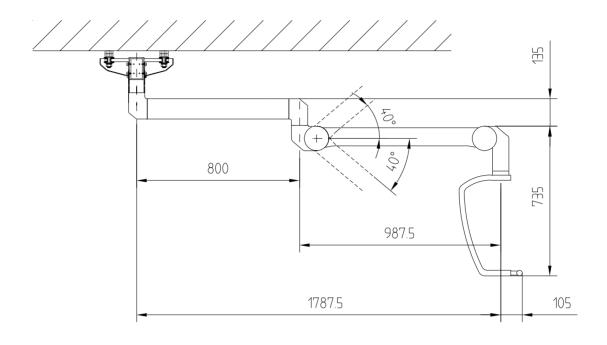
- intermediate ceilings and unfinished ceilings
- Drill 6 holes for the ceiling mounting.
 - Ensure that you drill exactly in the center of the cross-hairs.

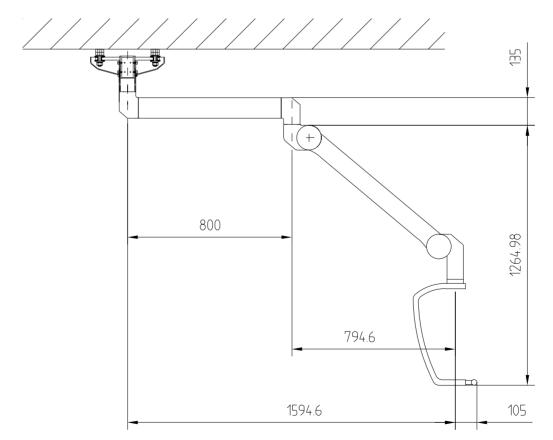


1) For ceiling mounting

Detailed measurements for Extension Arm System

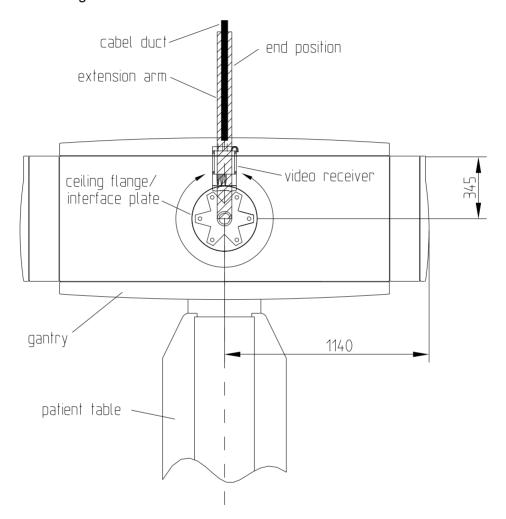
- **Vertical** turn angle: ± 40° from horizontal position.
- Horizontal turn angle: 350° to end position.





Positioning the overhead support

- For an optimized position, the overhead support should to be centered to the gantry.
 - Please note the "Room heights" on page 7 8.
- The video receiver is attached to the ceiling flange as specified via an installation plate. The direction of the video receiver is freely-selectable by turning the ceiling flange.
 - This optimizes the cable duct routing.
 - **However:** Verify the direction of rotation of the star-shaped ceiling flange. Refer to drawing below.



NOTE

Note that the sides adjacent to the angle are symmetric to the midline. Freely-selectable positioning of the fiber optic receiver.

Cable duct

- The cable ducts have to be preinstalled by the customer.
 - PDC => Overhead support (installation plate for video receiver)
 - ICS => Overhead support (installation plate for video receiver)
 - Minimum size: 30 x 30 mm

NOTE

A wire pull should be provided in the cable duct to help in routing the system connections.

Room heights

Room height requirements

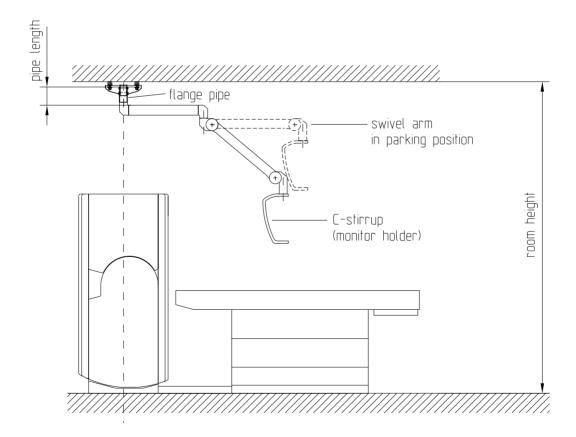
• Two flange pipes (150 mm and 580 mm long) for variable room heights are included in the delivery.

It is <u>important</u> to adhere to the following safety information:

For room heights [mm]	Flange tube required [mm]	
2640 to 3210 1)	150	
>3210 to 3610	580	
<2640 oder >3610	Only monitor trolleys should be used.	

NOTE

1) In the range between 2725 mm to 2860 mm, the ceilingmounted tube support should be assembled so that the C-arm cannot be parked over the gantry.



NOTE

Delivery includes both flange tubes.

- Select the flange tube matching the room height.
- Scrap the other flange tube.

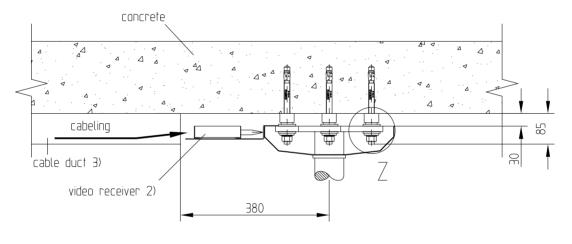
Different installation versions

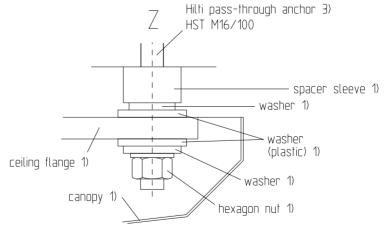
Unfinished ceiling

For unfinished ceilings, the star-shaped ceiling flange is mounted directly to the concrete ceiling with a Hilti pass-through anchor and the appropriate spacers and washers.

- Pass-through anchors
 - have to be procured by customer.
 - Recommended: Hilti pass-through anchors, Type: HST M16/100.
 - Extraction force: 6 kN.
 - Protrusion: 85 mm.
 - Torque: 125 Nm.
 - Mount according to manufacturer's specifications.
- · Check the concrete of the unfinished ceiling.
 - Required concrete class B25.
- Use spacers to compensate for any unevenness in the ceiling.
 - Not in delivery volume.

Illustration





- 1) In delivery volume
- 2) Will be mounted at the time of the CARE Vision option installation and is shown only for additional clarification
- 3) On-site

Intermediate ceiling

For intermediate ceilings, the media interface plate is mounted to the concrete ceiling. The star-shaped ceiling flange is adjusted to the intermediate ceiling using the 6 threaded rods, leveled and secured using hexagonal nuts. The system cable is routed to the video receiver, and/or ceiling outlet in the space created between the intermediate and the unfinished ceiling.

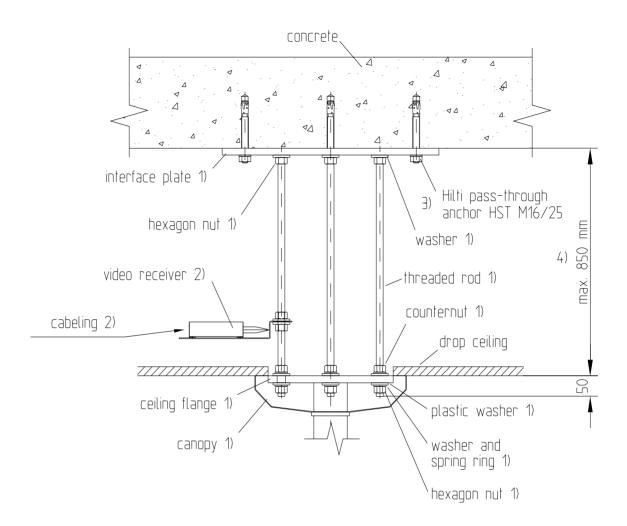
- Pass-through anchors
 - have to be procured by customer.
 - Recommended: Hilti pass-through anchors, Type: HST M16/25
 - Extraction force: 6 kNProtrusion: 50 mmTorque: 125 Nm
- Check the concrete of the unfinished ceiling.
 - Required concrete class B25
- Observe minimum ceiling cut-out in intermediate ceiling for media interface plate.
 - Min: 515 mm
- Fill in cut-out after installation.
 - Cover diameter: < 340 mm
- Threaded rods (in delivery volume).
 - Supplied length: 900 mm
 - Shorten to size

Formula:

Length of threaded rod= height of intermediate ceiling + 50 mm Refer to drawing.

- **Distance** 50 mm between lower edge of intermediate ceiling and lower end of threaded rod. Refer to drawing on the next page.
- Level the ceiling flange in the horizontal direction by turning the hexagonal nuts.
- Hexagonal nuts
 - Torque: 100 Nm

Illustration



- 1) In delivery volume
- 2) Will be mounted at the time of the C.A.R.E. Vision option installation and is shown only for additional clarification
- 3) On-site
- 4) Measurement depends on the on-site situation

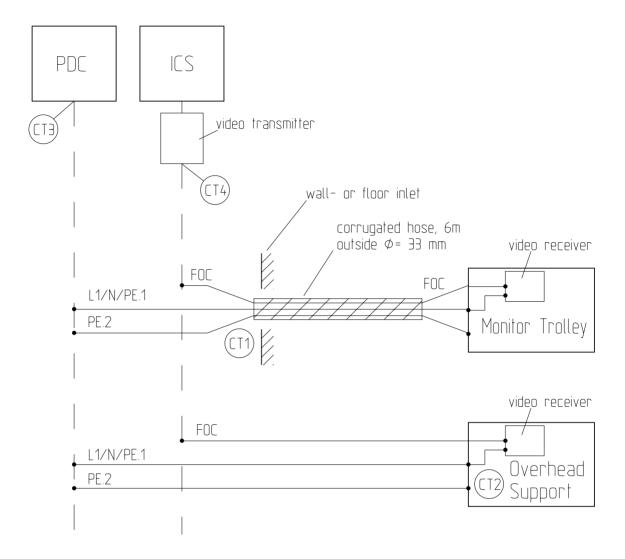
Monitor trolley



• Connection cable

- **Room to move:** 6 m from monitor trolley to wall or floor outlet. Line voltage, fiber optic cable, grounding cable are routed in corrugated hose.
- Total length (without corrugated hose, free cable length:
 17.70 m (line voltage)
 22.90 m (fiber optic cable)

System Connections



Cable	from fix point	to fix point	Max. Fix point distance	Comments
	From monitor trolley			
FOC	CT1	CT4	22.90 m	Fiber optic cable from video transmitter to video receiver
L1/N/PE.1	CT1	СТЗ	17.70 m	Power line for video receiver and monitor
PE.2	CT1	CT3	17.70 m	Additional grounding
	From overhead support			
FOC	CT2	CT4	30 m	Fiber optic cable from video transmitter to video receiver
L1/N/PE.1	CT2	CT3	25 m	Mains for video receiver and monitor
PE.2	CT2	СТЗ	25 m	Additional ground

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General

Please note following planing-related differences: when exchanging a

SOMATOM Volume Access / Volume Zoom / Sensation 4

all CT system components must be exchanged.

Existing mains connection, water connection and premises can be used further.

NOTE

For additional planning, use the valid Planning Guides for the respective CT systems mentioned above.

Changes

Gantry

- The gantry stands on the 4 adjustable feet.
 - No area load but
 - **Point load** (5000 N ± 10% per adjustable foot).
- An installation floor requires an on-site subfloor construction in the area of the installation support surface for the adjustable feet.
 - The gantry may not be placed directly on the installation floor plates.
 - The installation floor plates must be cut out in the area of the installation support surface for the adjustable feet.
 - The adjustable feet must stand non-positively/directly on the subfloor construction.
- Note the dimensions of the gantry.
 - Larger width and length.
 - It is possible to remove front and rear gantry covers to reduce dimensions for transportation.

Patient table

- 1 additional fixing point in table base.
 - New location for 2 fixing points.
 - If you install on a mounting frame ensure there is a fixing possibility in/on the mounting frame for the new fixing points.
- Length of the table base is about 125 mm shorter.
 - Due to the former larger table base, a low-cut area of the flooring is left visible. This
 must be leveled and sealed again with the same flooring (if available) for cosmetic
 purposes.
- The connection piece between gantry and patient table is mounted to the floor with 4 screws.

Heat exchanger

- No changes required at existing on-site heat exchanger connection.
 - To **improve** the **operational safety** of the heat exchanger, we recommend a value of **15 kW** for new installations.
 - Check the specification for an **existing on-site cooling unit** in the primary cooling circuit.

IRS cabinet

- Additional cabinet with additional space requirements.
 - Clarify available installation space.
 - Additional noise emission of 55 dBA.
 - Additional heat dissipation of 1.4 kW to the surrounding area.
 - Additional cable ducts to the IRS cabinet are required.
 - To guarantee the tilt safety according IEC and UL, the IRS cabinet must be **firmly** secured to the floor **or** to the wall.

Local dose

- Varying local dose distribution.
 - Check the existing radiation protection

Chapter	Page	Change	Reason
all	all	- Document was completely updated	Ä-Nr. 115259
1	11	 Paragraph "Image Evaluation System (IES)" was modified; IES is standard at Sensation Cardiac only. 	Ä-Nr. 121225
2	10	- Paragraph "Hazardous air pollutant content" was added.	Ä-Nr. 115259
	12	 Info regarding floor load was modified; new table was addded; existing was modified 	
	13 to 15	 Info regarding antifreeze agent was modified; table for antifreeze agent was added; section "On-site requirements for the water/air cooling system" was modifed (air hose connection to a air conditioned room also possible). Diagramm "Air flow rate" was added. 	
3	4	 Table in paragraph "Ground fault detector switch" modified; fault current from 30 mA to 300 mA was changed in the 400 V to 480 V voltage range 	
	- Table for size of connection terminal to 95 mm ² was added		Ä-Nr. 119193
	5	- Paragraph " Power line cabling to the PDC was removed and added to page 3-4	
	25; 26	- Extraction force of the patient table was modified from 2.1 kN to 870 N.	Ä-Nr. 115259
5	9	- Formula for connection load was modified.	
	10	- Power consumption in table and diagramm was modified.	

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