Biograph Vision

Basic Planning Information

SIEMENS Healthineers

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Legend

- Motion area / Swivelling range / Minimal room size / Safety distance
- Service area
- Floor mounted
- Ceiling mounted
- Wall mounted
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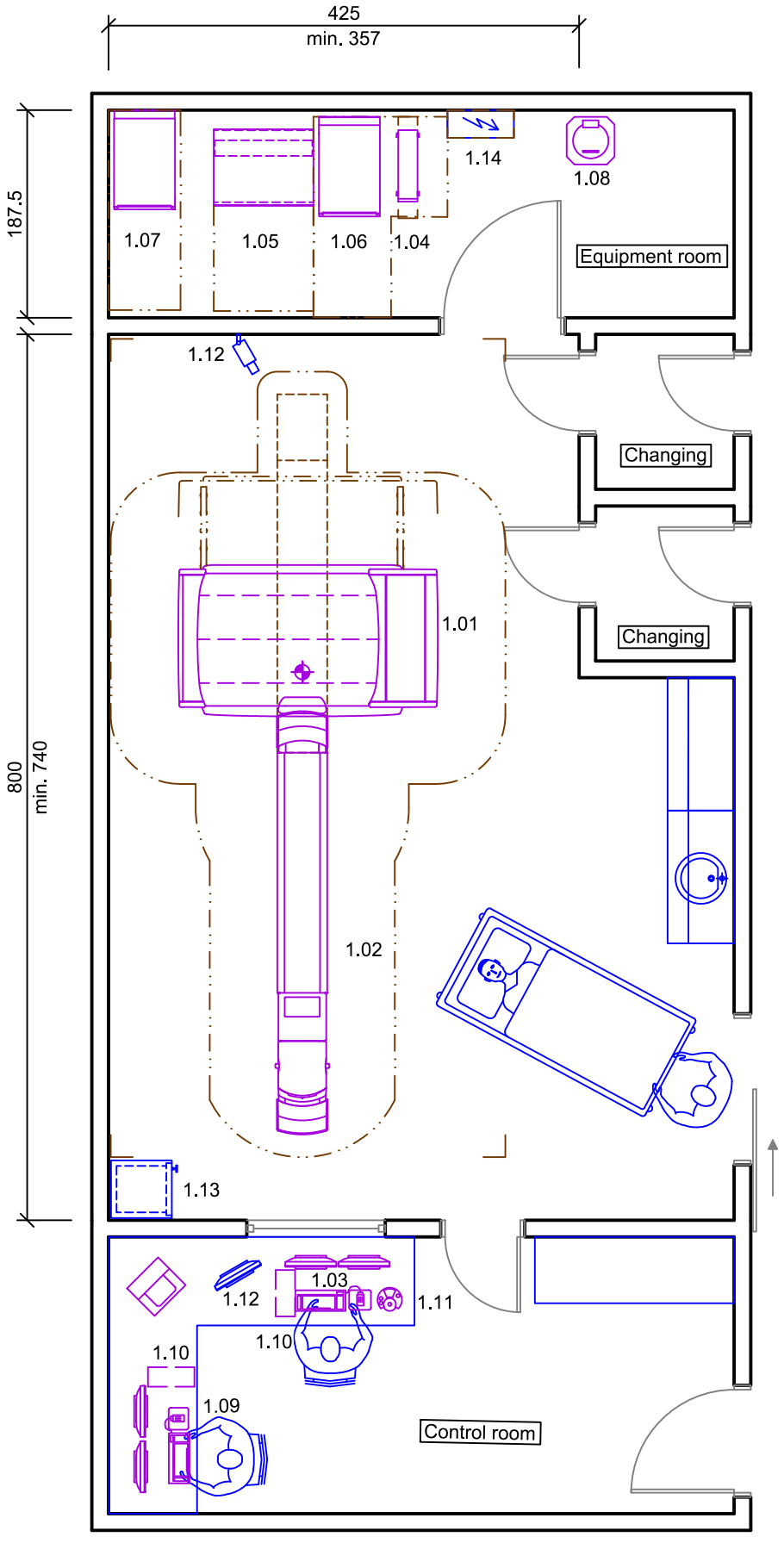
Dimensioning

All installation measurements apply to finished wall/floor/ceiling and are to be checked prior to assembling the unit.

Orientation point = reference point of the Siemens Healthineers unit for planning and installation

Please note: The drawing parts in this document are not to scale!

Planning Example



Biograph Vision - Equipment Legend				
		Weight (kg), Heat dissipation to the air (W)		
Pos.	Description	kg	W	Remark
1.01	Biograph Vision - PET Gantry - CT Gantry SOMATOM Definition AS	3040	2000	#1, Isocenter 1080 mm
1.02	Patient bed (1900 mm scannable range with extension)	720	*	* included in 1.01
1.03	Control unit with 2x 19“ TFT monitor, control box, keyboard, mouse	13	100	
1.04	IRSmx4c Tower PC (Image Reconstruction System)	42	<500	64 slices
1.05	PDC cabinet incl. UPS	623	2000	
1.06	cPDU (Power Distribution Unit) with UPS	432	2000	UPS optional
1.07	Chilled Water Cabinet	202	500	#2
1.08	Uniform source shield	178		
1.09	Biograph Advanced Workflow with 2x 19" TFT monitor, keyboard, mouse	13	100	optional
1.10	IES Tower PC (Biograph Advanced Workflow)	25	500	optional
1.11	Operating console	60		optional
1.12	Camera and monitor for patient’s observation			optional, recommended
1.13	Safe for phantoms	700		by customer
1.14	Power distributor			by customer
	#1 additional heat dissipation up to 16 kW to water #2 additional heat dissipation up to 0.3 kW to water			

Room Dimensioning

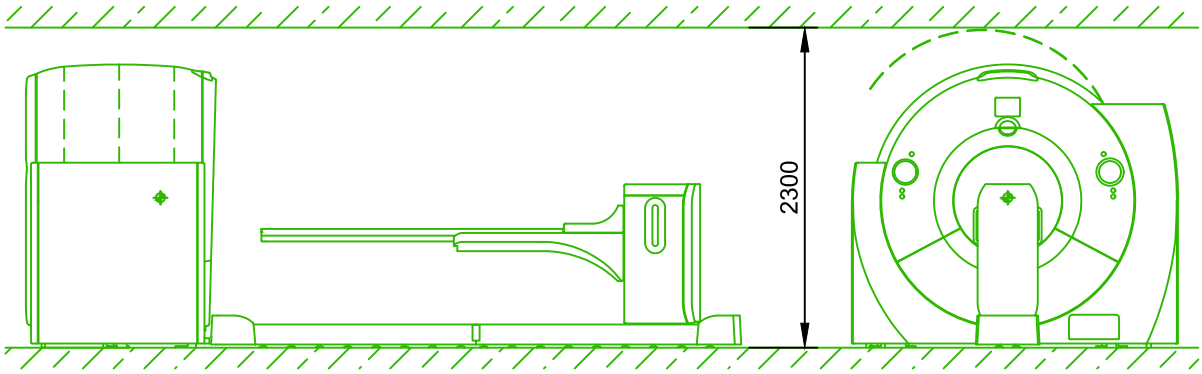
Room dimensioning

The indicated room dimensions have to be checked on site. The planning department has to be informed about possible deviations. Otherwise we cannot assume any guarantee for the accurate implementation of the dimensions indicated in the planning documents.

Room height

not to scale

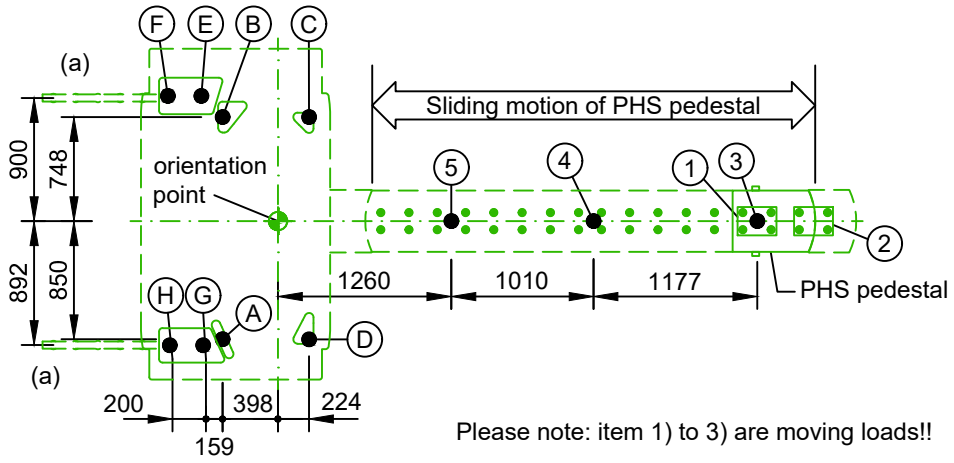
Required room height minimum 2300 mm (recommended 2440 mm),
measured from the highest point of the finished floor (with covering) to the lowest point of the ceiling.



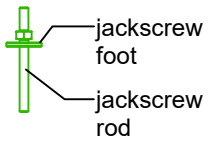
Statics and Transport

Floor load Biograph Vision

not to scale



View
PHS jackscrew



The jackscrew foot bears the pedestal of the stationary PHS base rails.
PHS = Patient Handling System

(A)(B)(C)(D) Fixing points CT-Gantry

(E)(F)(G)(H) Fixing points PET-Gantry

(a) Weight distribution PET gantry on pluggable floor rails for service (sliding motion of PET gantry to service position)

Load point	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
Max. load (static) [kg]	480.8	688.6	477.6	477.2	166.5	262.2	153.8	242.2
Area [cm²]	181.5	326.4	162.2	238.6	1107		1050	
Amplitude (dynamic) [kg]	28.6	40.8	52.6	40.4				

Patient bed

(1) Compression zone; max. compressive load 541 kg per jackscrew, supported by jackscrew foot

(2) Tension zone; max. tensile load 386 kg per jackscrew, supported by jackscrew rod

(3) Center of gravity of the PHS pedestal (= moving part) in the parking position: 390 kg without patient

(4) Center of gravity of the stationary base rails of the PHS: 329 kg

(5) Center of gravity of max. patient load 227 kg (variable position)

Floor structure:	Acceptable floor structural materials for the load bearing areas of the Gantry and the PHS are restricted to concrete, steel or high aggregate epoxy grouts.
Conditions of flooring:	Vibration free installation of the gantry and patient table only on - concrete flooring - access floor with suitable on-site sub-construction. Require an on-site friction free sub-construction made from steel in areas of support.
Subgrade:	Only concrete flooring; concrete class C20/25 to C50/60 acc. to DIN 1045-1, thickness min. 114 mm. Compressive strength of concrete min 20 N/mm² (28 N/mm² recommended); compressive and flexural modulus of elasticity >20.684 N/mm². Concrete must be cured at least 28 days prior to machine installation.
Weight capacity:	Have the concrete flooring tested by a stress analyst.
Anchor properties:	Allowable tension load capability for embedded concrete anchors min. 4.5 kN, drill depth typical for adhesive anchoring: min. 100 mm (check with ICBO guidelines, if applicable).
Floor levelness:	max. 12.7 mm over the entire footprint of the system; variation to be measured between rear PET mounting foot and first PHS jack bolt.
Floor covering:	min. static load limit rating of 5.2 N/mm² under the machine area. Remove floor covering in the load bearing areas. Anti-static flooring is recommended for the examination room. ESD (electrostatic discharge) flooring is also suitable..

The engineer of record for the building and the Siemens Healthineers project management shall jointly review deviations for the a.m. requirements. The engineer of record shall provide a support structure designed to support all weights and forces. It is the customer´s responsibility to contract a qualified specialist to implement site modifications that meet these specific limits and to design structural solutions in case of deviations.
Installation on a floating floor without sub-construction is prohibited.
In areas prone to earthquakes it is required to bolt down all system components according to the local or national regulations.

Transport Biograph Vision

not to scale

All dimensions in mm	Length	Width	Height	recommended door width
CT-Gantry on transport device - standard transport - transport rollers swivelled out	2580	1438	min. 1987*	min. 1500 x 2010
CT-Gantry on transport device - through narrow passages - transport rollers swivelled in	3190	931	min. 1987*	min. 1000 x 2010
PET-Gantry on transport device - standard transport - with stabilizers	3000	892	2085	min. 950 x 2100
PET-Gantry on transport device - through doorways - without stabilizers	3000	845	1929	min. 950 x 2000
PHS (Patient Handling System) Box 1 - with packing -	2440	1020	min. 1830	min. 1150 x 2000
PHS (Patient Handling System) Box 2 - with packing -	2440	1020	min. 610	

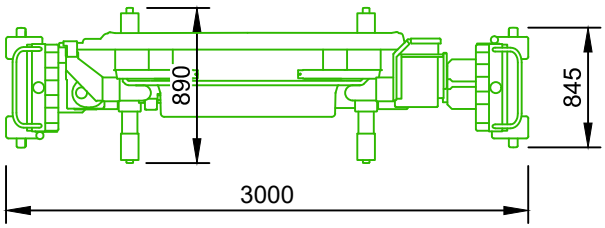
CT-Gantry with transport device, without covers = 2280 kg (transport device = 189 kg)
PET-Gantry with transport device and stabilizer, without covers = 1277 kg
(transport device and stabilizer = 286 kg)
PHS (Patient Handling System) Box 1 = 817 kg, Box 2 = 318 kg

Tipping hazard! Transport with the rollers swivelled in is permissible only in narrow passages! As soon as the system has passed through narrow passages, the transport rollers have to be swivelled out again.
Access floors in transportation route have to be designed for a weight capacity of min. 400 kg per slab/plate. During gantry transport, the load may be even higher at certain individual points (3-point-load e.g.due to uneven flooring).
If required, cover the transport routes with metal sheets for load distribution.

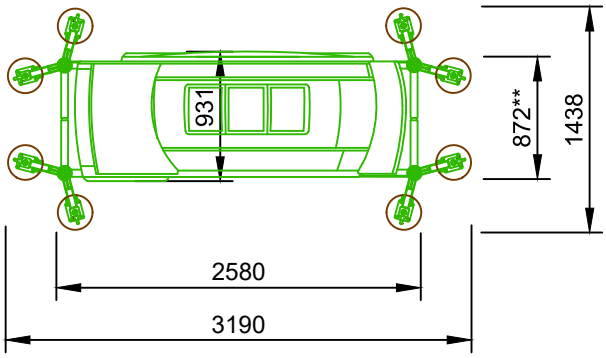
The door must have a final clearance of 1250 mm if bed entrance is requested.

The entire system must be transported in the undamaged transport packaging provided by the manufacturer.
A truck equipped with air shocks must be used for land transport of the system.

Top view NM-Gantry
with transport device



Top view CT-Gantry
with transport device



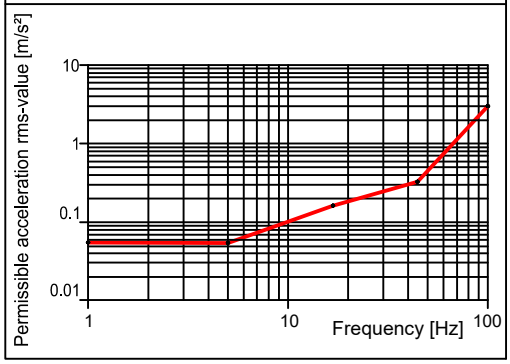
* The transport device with the gantry can be lowered to a ground clearance of 7 mm.
** The Gantry can be moved through the entrance < 1000 mm, when the transport adapter is partially removed.

Floor- and building vibrations

Floor- and building vibrations can reduce image quality!

Sources that produce vibrations are, e.g.:
Railroad routes, subways, roads, road works and construction sites, hospital power plants, mines, open-cast minings, quarries (explosions), ferry moorings, any other sources of striking vibrations.
The PET-CT system is not sensitive to common vibrations. If the CT is away from vibrational sources, or the PET-CT is replacing a PET-CT system that to date has not shown image quality problems due to vibrations, it is usually not necessary to execute vibrational measurements.
If there are any doubts the compliance of the thresholds has to be verified by measurement.

Permissable continuous floor vibrations



In the three spatial directions, acceleration in vibrations at the mounting points of the PET-CT (Gantry and Patient Handling System PHS) must not exceed the thresholds as described in the above shown diagram.
The threshold is valid for vibrations at the installation location with a PET-CT in position.
Measurements are usually taken at the site before the installation of the PET-CT. changes in the eigenfrequency of the slab caused by the additional mass of the PET-CT have to be considered when comparing the frequency spectrum with the threshold.
It is the customer's responsibility to contract a qualified specialist who must implement site modifications to meet the specific limits, and to design structural solutions in case of deviations.

Any transient vibration has to be less than 0.5 m/s² peak-to-peak in the time domain. The vibrations have to be measured with a sampling rate of 1000 Hz.

Air-conditioning

Climatic Conditions for Transport and Storage

Transport	Temperature	-20 to +50 °C
	Temperature gradient	10 °C/h
	Relative humidity	10 to 90 % non condensing
	Air pressure	700 to 1060 hPa
	Max. transport time	2 months
Storage	Temperature	10 to 30 °C
	Temperature gradient	10 °C/h
	Relative humidity	20 to 75 % non condensing
	Air pressure	700 to 1060 hPa
	Max. storage time	6 months

The data for transporting and storing the system are applicable only, if the system is shipped free of damage in the transport packaging provided by the manufacturer.
All components have to be stored in the respective packaging provided by the manufacturer.
If the original packaging is not available any longer, an equivalent packaging for intermediate storage has to be used.

Environment		
Scan room	Temperature Max. temperature gradient Relative humidity Air pressure	18 to 28 °C 1.5 °C/h 20 to 75 % (dewpoint below 17°C) 750 to 1060 hPa
Control room	Temperature Relative humidity Air pressure	18 to 28 °C 20 to 75 % 750 to 1060 hPa
Equipment room	Temperature Relative humidity Air pressure	18 to 30 °C 20 to 75 % (dewpoint below 17°C) 750 to 1060 hPa
We recommend to install a temperature controller and display for monitoring the a.m. room conditions. Air conditioning is required 24 hours/day, 7 days/week If outside air (fresh air) is supplied, we recommend using dust filters on-site of filter class EU3 to EU4 for filtering dust particles > 10µm according to DIN 24185, Part 2, or in accordance with the hygiene regulations of the respective country. Ventilation and air change according to DIN 6844 part 1, or in accordance with national regulations.		
Static magnetic field B < 100 µT; Magnetic field variation ΔBeff < 25µT		

Cooling Water Installation

On-site cooling requirements	
Output to on-site cooling water	16.3 kW
Water temperature	4°C - 12°C; minimum 4°C
Temperature gradient (cooling water)	max. 1 K/min.
Operating pressure	nominal 2.000 - 6.000 hPa, maximum 10.000 hPa
Water quality	Potable water quality, particle size ≤ 0.25 mm, pH-value 8.0 - 9.5
Additional recommendation for service	Flow, temperature and pressure gauge, shut-off valves
For service a faucet with screw connection (no automatic shutt-off!) as well as a water drain (sink) is required in the proximity of the Gantry. A water drain is also required for condensed water from the CT gantry e.g. to a sink or a siphon. Before the installation of the Biograph a differential pressure test must be performed. The optional water/air-split cooling system should be used, if a suitable on-site water connection is not available.	

Electrical Installation

Power requirements for Biograph Vision			
Power line: TN-S System	3/N/PE AC 50/60 Hz ± 2 Hz	Connection value cPDU:	110 kVA
Line voltage:	400 V ± 10 %	Power consumption:	
Loop impedance with 150 A fuse:	120 mΩ	Stand-by:	14 kVA
Line impedance (standard 80 kW):	≤ 95 mΩ	Computer on:	12.5 kVA
Line impedance (option 100 kW):	≤ 85 mΩ	System off:	11 kVA
		at 6s (standard 80 kW):	≤ 135 kVA
		at 6s (option 100 kW):	≤ 150 kVA
Cable cross section is to be determined by calculation			
Size of connector terminals in the cPDU is for L1, L2, L3 is 35 to 70 mm² and for N, PE 16 mm².			

Room lighting
Ambient lighting in rooms with diagnostics or with workstations must comply with the respective local and national regulations. General requirements like the needed intensity of illumination - adjustable, reproducible, flicker-free or a limitation of dazzlings and reflections etc. have to be observed (EN 12464-1, DIN 5035-7).

General Information

Display screen workstations

For setting up display screen workstations, take account of the guidelines in the Display Screen Workstation directive as well as any national regulations (e.g. EN ISO 9241-5).

Smart Remote Services (SRS)

Smart Remote Services (SRS) is used for remote diagnostics as well as remote service to provide highest system availability.
Requirements:
- Broadband connection (minimum 4 MBit/s down- and 768 kBit/s upstream, optimum 30 MBit/s down- and 2 MBit/s upstream) without time or volume limitations
- Router (for exclusive use with SRS)

Data protection and security is defined in the Smart Remote Services security concept.

Network Integration

The Siemens Healthineers components are using TCP/IP Protocol, a 100/1000 Mbit/s switched Ethernet network and static IP addresses.
The required network cabling (min. CAT 5 TP) has to be provided on site. Media converters, which are needed for using fibre optic cabling, are not in scope of delivery.
To prepare the implementation of the new system into the existing network environment, the availability of the needed network data at least two weeks before starting the installation is mandatory.
This is the only way to ensure a seamless integration of the new system into the workflow of the department.

Notes on preparations for installation

Contracts for performing and supervising on-site installation preparations should be concluded with technically competent companies by the customer. The customer is responsible for timely and proper completion and supervision of all preparations for installation at the construction site in observance of all applicable legal regulations (e.g. X-ray regulations, radiation protection regulations) and all applicable general recognized rules of technology (e.g. VDE regulations, DIN standards).
Execution and supervision of installation preparations at the construction site and later observance of the standard operating conditions are not included in our duties. The customer is responsible for checking the static calculations and, where applicable, the air conditioning in the building to be equipped.

Safety distances

Distances from moving parts of the medical device to walls, furniture and other equipment have to be kept to avoid injuries by crushing in compliance with local regulations, e.g. a minimum distance of 50 cm according to DIN EN ISO 13854.

It is the customer's responsibility to ensure the above requirements are followed.
This is to avoid the risk of injury.

If safety distances are not maintained appropriate on-site safety measures have to be put in place.
Clear visible markings according to national guidelines, e.g. crushing warning signs, hazard warning tape, hazard area cordon, safety mats, may be required.

Radiation protection

The structural radiation protection depends on the location of the unit and the function of the surrounding rooms. By order, the planning departments of Siemens Healthineers prepare radiation protection calculation and radiation protection plan.

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Published by
Siemens Healthineers AG
SHS ES FD

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