

NAEOTOM Alpha

Basic Planning Information

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Legend

- Motion area / Swivelling range / Minimal room size / Safety distance
- Service area
- Additional equipment
- Ceiling mounted
- Wall mounted
- Floor mounted
- New construction
- Demolition

Dimensioning

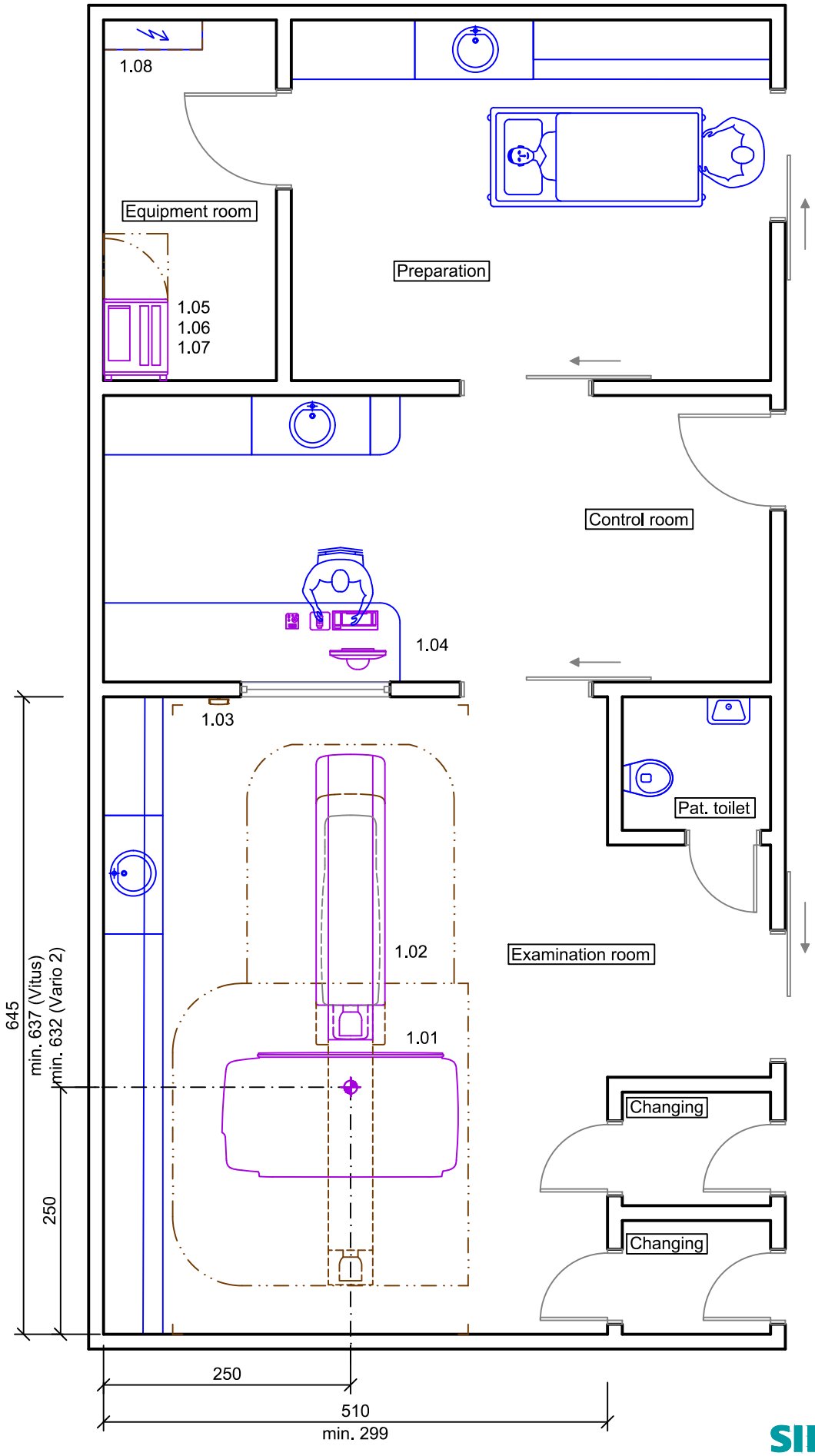
All installation measurements apply to finished wall/floor/ceiling and are to be checked prior to assembling the unit.



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



NAEOTOM Alpha - Equipment Legend				
		Weight (kg), Heat dissipation to the air (W)		
Pos.	Description	kg	W	Remark
1.01	Gantry	2850	2000	#1, Isocenter at 1020 mm
1.02	307 kg Multi Purpose Table MPT Vitus (2000 mm scannable range)	475	300	
1.03	Wireless Access Point	3		
1.04	Control unit with TFT monitor, control box, keyboard	9	100	
1.05	IRSxp Tower PC	29	1500	216 x 581 x 445 mm
1.06	ALON - UPS	29	350	602 x 85 x 430 mm, 2x
1.07	Rack for IRS and UPS	51		650 x 824 x 624 mm
1.08	Power Distributor			by customer
	#1 Additional heat dissipation up to 21 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

Technically required minimum room height 2250 mm for the CT system - additional components not considered. Measured from the highest point of the finished floor (with covering) to the lowest point of the ceiling.

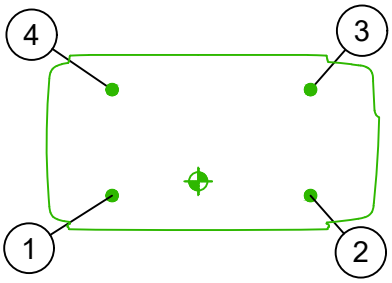
On-site IT

Poor network bandwidth impairs the performance of image transmission significantly. As the ICS Ethernet card supports a network connection speed of up to 10 Gbit/s, it is highly recommended to check that the DICOM nodes connected to the scanner (e.g. PACS, research PACS, syngo.via, etc.) support at least 1 Gbit/s and that the network infrastructure to these DICOM nodes with all components (e.g. cabling, switches, router, etc.) support at least 1 Gbit/s. The storage capacities will need to have a suitable dimension in order to handle the amount of data provided by an Alpha.class system.

Statics and Transport

Statics

not to scale



The floor construction has to be performed solid and free of vibration, e.g. concrete flooring C20/25 to C50/60 corresponding to DIN EN 206-1, according to the maximum values as specified in the textblock “Floor and building vibrations”.
It is recommended to test the weight capacity of the concrete or composite flooring by a stress analyst.
Fastening the gantry on the floor is possible but only necessary in countries prone to earthquakes or according to local regulations.
Securing the patient table to the floor is mandatory.

Total weight of Gantry: 2850 kg	Total static load (center of gravity): $F_{stat\ total}$ = 28.5 kN

Partial load on gantry foot number		①	②	③	④
Nominal static load after levelling	$F_{stat\ nom}$ [kN]	6.5	8	8	6.5
Maximum dynamic load (amplitude) during gantry rotation	$F_{dyn\ max}$ [kN]	± 0.5	± 0.5	± 0.5	± 0.5
Outer diameter gantry foot [mm]		80	80	80	80
Floor contact area gantry foot [cm²]		50.27	50.27	50.27	50.27

During gantry installation and leveling, the maximum possible load on one gantry foot can be 16 kN (the gantry is standing on two diagonal feet). Design access floors for a weight capacity of min. 400 kg per slab/plate. During gantry transport, the load may be higher at certain individual points (3-point load, e.g. due to uneven flooring).

Floor- and building vibrations

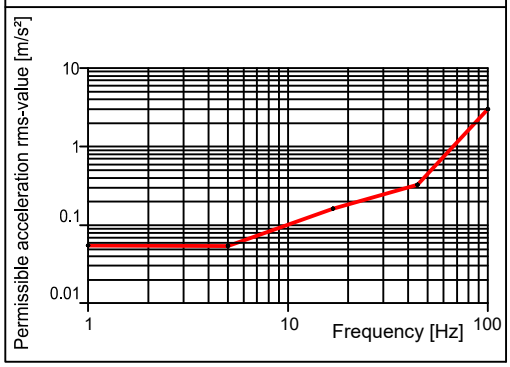
Floor- and building vibrations can reduce image quality!

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. Any transient vibration has to be less than 0.5 m/s² peak-to-peak in the time domain.

The CT system is not sensitive to common vibrations. If the CT is away from vibrational sources, or the CT is replacing a CT system that to date has not shown image quality problems due to vibrations, it is usually not necessary to execute vibrational measurements.

It is the customer's responsibility to contract a qualified specialist. The specialist must implement site modifications to meet the specific limits, and to design structural solutions in case of deviations.

Permissable continuous floor vibrations



If there are any doubts, the following thresholds have to be verified by measurement:
In the three spatial directions, acceleration in vibrations at the mounting points of the computer tomograph (Gantry and Patient Handling System PHS) must not exceed the thresholds as described in the above shown diagram.

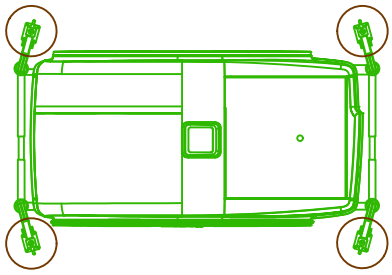
Transport

not to scale

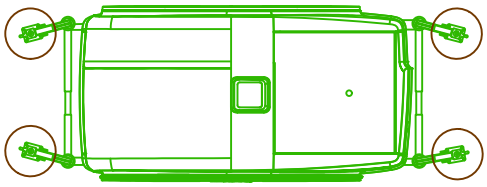
The transport route (doors and hallways) needs sufficient dimensions for the following parts!

Gantry with transport device

Transport rollers swiveled out
2751 x 1746 x 2002* mm (L x W x H)



Transport rollers swiveled in
3448 x 1291 x 2002* mm (L x W x H)
3448 x 1321 x 2002* mm with myNeedle Laser



* The transport device with the gantry can be lowered to a ground clearance of 7 mm.

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.

Gantry with transport device 3000 kg , transport device 285 kg.
The maximum possible floor load (2-point load) per roller may be reached during gantry transport.
If necessary, cover the transport route with metal sheets to distribute the load.

The door must have a final clearance of 1250 mm if bed entrance to the CT examination room is requested.

PHS Vario2	Weight 609 kg	2600 x 824 x 1505 mm (L x W x H)
PHS Vitus	Weight 674 kg	2600 x 824 x 1505 mm (L x W x H)

Transport technical components				
The IRS tower is delivered on a special shock-absorbing transport pallet. Moving through the building is not permitted without this pallet.				
Transport dimensions	Length (mm)	Width (mm)	Height (mm)	Weight (kg)
IRS tower	800	900	650	60
Rack (value in brackets with earthquake kit installed)	823	650 (723)	624	75
UPS GXT5	717	570	262	35
Forerun heat exchanger	1175	635	1250	195

Environmental conditions

Environment		
Entire CT System	Temperature Relative humidity Barometric pressure Temperature gradient Installation altitude	18 to 30 °C 20 to 75 % 800 to 1060 hPa 6 K/h max. 2000 m.a.s.l.
Maintain the temperature range required to meet the needs of changing seasons. If it is not possible, an on-site room heating and air conditioning system is required. When supplying air from the outside (fresh air), we recommend the on-site use of coarse Filters, Filter class G3 to G4 for filtering dust particles up to > 10 µm.		

On-site requirements for connection - cooling system (integrated into gantry)			
Water temperature (depending on the water flow volume)	Temperature gradient	Water pressure	Water quality
4 to 16 °C (without antifreeze) 4 to 14 °C (with antifreeze) **(depending on the relative humidity in % and the room temperature)**	max. 1 K / min	Nominal: 2 - 6 bar / Max.: 10 bar	Recommended potable water quality, max. particle size ≤ 0,25 mm
Heat dissipation to on-site cooling water max. 21 kW. Anti-freeze mixing ratio 40 %			
Depending on the water input temperature following requirements are valid:			
Minimum flow rate (without antifreeze) 1000 to 3700 l / h		Pressure loss (with and without anti-freeze)	0.45 bar - 2.8 bar
Minimum flow rate (with antifreeze) 1500 to 3450 l / h			
For service and filling procedure a water faucet with screw connection and a water drain (e.g. a sink or a siphon) in vicinity of the gantry is necessary.			

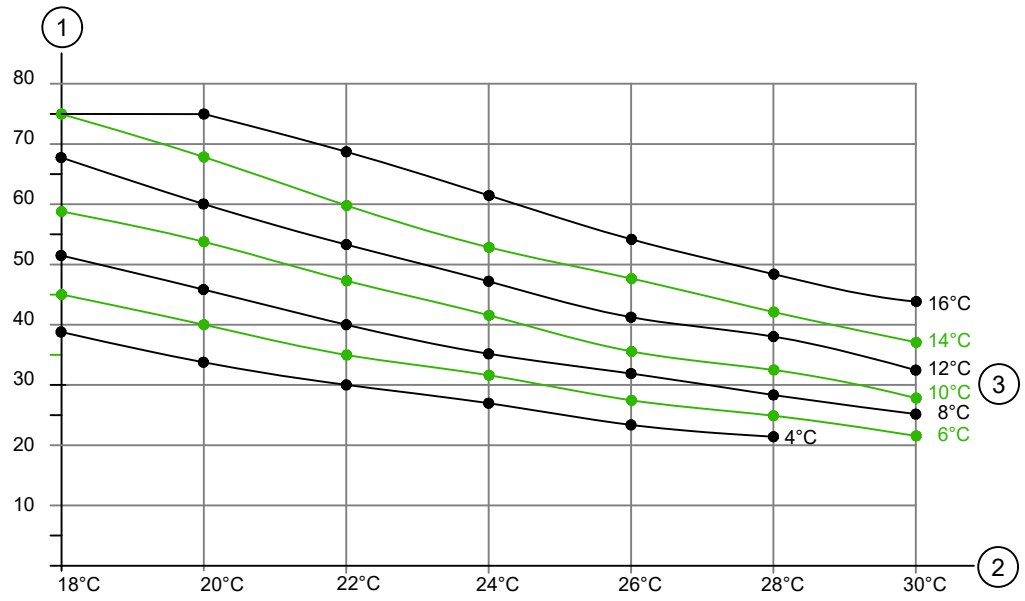
Climatic conditions for transport and storage

Transport and storage of all components	Temperature Relative humidity Barometric pressure Temperature gradient Max. storage time	-20 to +50 °C 5 to 95 % 700 to 1060 hPa 6 K/h 2 months

The data for transporting and storing the CT system apply 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 original transport packaging. If the original packaging is no longer available, you have to use an equivalent packaging for intermediate storage.
After moving the CT system from a cold into a warm environment, make sure that condensed water is dried off in the entire CT system before switching ON.

Humidity in CT room

Condensation inside the gantry shall be avoided. This may happen if the cooling water temperature is below the dew point.
Therefore, the room humidity shall be kept below the value shown in the following figure and stable, depending on the cooling water temperature to avoid image artefacts.
The higher the cooling water temperature the more variable are the other parameters.
If necessary an external Forerun Heat Exchanger can be supplied or the Water/air-split system can be ordered.
Also the installation of dehumidifiers and automatically closing doors would be options to support stable climatic room conditions.



1 Rel. humidity in %	2 Room temperature	3 Cooling water temperature

Electrical Installation

Power requirements

Power Line: TN-S	3/N/PE AC 50/60 Hz ± 3Hz	Connection value	173 kVA
Line Voltage:	400 V ± 10 %	Power consumption:	
Line impedance:	see diagram	Stand-by:	≤ 6 kVA
		System off:	0 kVA
Cable cross section is to be determined by country regulation		for the time up to 4 s:	max. 300 kVA

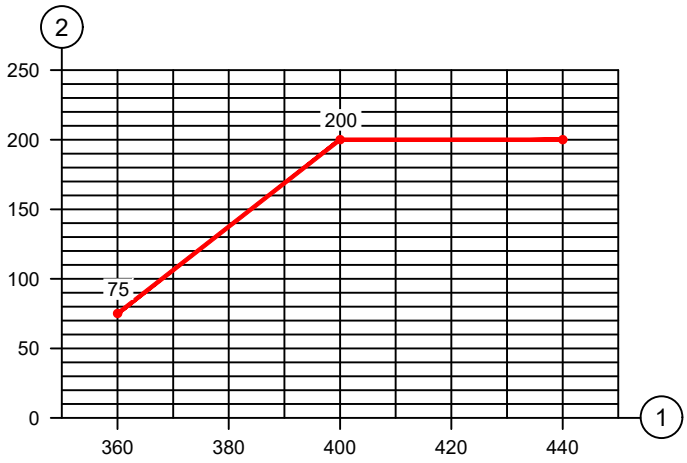
Size of connector terminals in the gantry is 25 to 95 mm². N, PE adapter terminal 16 mm² available

Power requirements (water/air - split)

Power Line: TN-S	3/N/PE AC 50/60 Hz ± 3Hz	Connection value	173 kVA + 22 kVA
Line Voltage:	400 V ± 10 %	Power consumption:	
Line impedance:	see diagram	Stand-by:	≤ 25 kVA
		System off:	0 kVA
Cable cross section is to be determined by country regulation		for the time up to 4 s:	319 kVA

Size of connector terminals in the gantry is 25 to 95 mm². N, PE adapter terminal 16 mm² available

Line impedance related to measured line voltage



(1) Minimum measured line voltage [VAC]

(2) Maximum allowed line impedance [mΩ]

The maximum allowed line impedance depends on the actual measured lowest line voltage.
We recommend monitoring the voltage over a period of 24 hours preferable on work days to specify the minimum.

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 10 Mbit/s down- and upstream, optimum 50 Mbit/s down- and upstream) without time or volume limitations
- The computer hosting of the Teamplay Receiver requires access to the hospital intranet and the internet. It should have a at least 6 Mbits/s upstream to the internet and at least 100 Mbits/s downstream from the internet.
- 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 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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Siemens Healthineers Headquarters
Siemens Healthineers AG
Siemensstr. 3
91301 Forchheim, Germany
Phone: +49 9191 180
siemens-healthineers.com

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