Τζάνειο Γεν. Νοσ. Πειραιά

Απαιτούμενες εργασίες για την εγκατάσταση του Αξονικού Τομογράφου

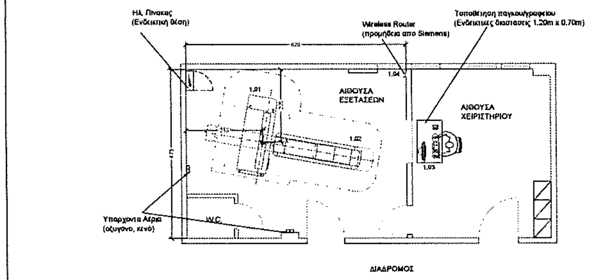
1. Διαμόρφωση των χώρων βάσει της Κάτοψης-Πρότασης. (Βλ. σχέδιο Κάτοψη-Πρόταση).
2. Κατασκευή μολυβδοθωρακίσεων της Αίθουσας Εξετάσεων, σύμφωνα με την Μελέτη Ακτινοπροστασίας του Νοσοκομείου.
3. Εξασφάλιση της στατικής αντοχής στην Αίθουσα Εξετάσεων σύμφωνα με το βάρος του Gantry. (Βλ. πίνακα "Statics").
4. Εξασφάλιση επιπεδότητας στην Αίθουσα Εξετάσεων με μέγιστη απόκλιση ± 5cm/m. (Βλ. σχέδιο Δάπεδο & Δίκτυα).
5. Εξασφάλιση έδρασης/στήριξης του Gantry No 1.01 και του Patient table No 1.02. (Βλ. σχέδιο Δάπεδο & Δίκτυα).
6. Τοποθέτηση Γραφείου/Πάγκου στην Αίθουσα Χειριστηρίου. (Βλ. σχέδιο Δάπεδο & Δίκτυα).
7. Προμήθεια και τοποθέτηση min. 3 πριζών ρεύματος και 3 πριζών δικτύου στην Αίθουσα Χειριστηρίου. Προτεινόμενη καλωδίωση δικτύου CAT6.
   Προτείνεται η τοποθέτηση 3 πριζών ρεύματος στην Αίθουσας Εξετάσεων. Οι θέσεις των πριζών είναι ενδεικτικές. (Βλ. σχέδιο Δάπεδο & Δίκτυα).
8. Εξασφάλιση Internet στην Αίθουσα Χειριστηρίου για τις περιπτώσεις τηλε-υποστήριξης Siemens Remote Services (SRS).
9. Προμήθεια και τοποθέτηση επισκέψιμων πλαστικών επιτοίχιων καναλιών στην Αίθουσα Χειριστηρίου και Εξετάσεων. (Βλ. σχέδιο Ηλεκτρολογικά).
10. Κλείσιμο/επικάλυψη των υπαρχόντων ενδοδαπέδιων καναλιών που δεν θα επαναχρησιμοποιηθούν. (Βλ. σχέδιο Ηλεκτρολογικά).
11. Προμήθεια και τοποθέτηση νέων μεταλλικών - μη διάτρητων - ενδοδαπέδιων καναλιών. (Βλ. σχέδιο Ηλεκτρολογικά).
12. Εξασφάλιση ηλεκτρικής παροχής σύμφωνα με τις απαιτήσεις του συγκροτήματος. (Βλ. πίνακα Power supply SOMATOM go.Up).
13. Προμήθεια και τοποθέτηση Ηλ. Πίνακα. Η θέση του είναι ενδεικτική. (Βλ. σχέδιο Κάτοψη-Πρόταση).
14. Προμήθεια και τοποθέτηση καλωδίου olflex (εύκαμπτο γκρι) 5x25mm², από τον Ηλ. Πίνακα έως το τέλος του ενδοδαπέδιου καναλιού κάτω από το Gantry, με επιπλέον ελεύθερο μήκος 2.0m. (Βλ. σχέδιο Ηλεκτρολογικά).
15. Προμήθεια και τοποθέτηση μπουτονιέρας (EAT) On-Off με λαμπάκι στην Αίθουσα Χειριστηρίου σε ύψος 1.60m από το δάπεδο. (Βλ. σχέδιο Ηλεκτρολογικά και πίνακα Power supply SOMATOM go.Up).
16. Προμήθεια και τοποθέτηση μπουτονιέρας/μανιτάρι (AT) Emergency-Off δύο επαφών, σε ύψος 1.80m από το δάπεδο, στις Αίθουσες Χειριστηρίου και Εξετάσεων. Το ένα σετ καλωδίων θα καταλήγει στον Ηλ. Πίνακα και το άλλο στο τέλος του ενδοδαπέδιου καναλιού κάτω από το Gantry, με επιπλέον ελεύθερο μήκος 2.0m. Οι θέσεις είναι ενδεικτικές. (Βλ. σχέδιο Ηλεκτρολογικά και πίνακα Power supply SOMATOM go.Up).
17. Προμήθεια και τοποθέτηση Ενδεικτικής Λυχνίας (SW) πάνω από την πόρτα εισόδου της Αίθουσας Εξετάσεων και Χειριστηρίου. Οι Ενδεικτικές Λυχνίες θα πρέπει να τροφοδοτούνται από τον Ηλ. Πίνακα και η καλωδίωσή τους να καταλήγει στο τέλος του ενδοδαπέδιου καναλιού κάτω από το Gantry με επιπλέον ελεύθερο μήκος 2.0m, όπου θα συνδεθούν σε ξηρή επαφή. (Βλ. σχέδιο Ηλεκτρολογικά).
18. Προμήθεια και τοποθέτηση Μαγνητικής επαφής (TS) στην πόρτα εισόδου της Αίθουσας Εξετάσεων και Χειριστηρίου. Η καλωδίωσή τους να καταλήγει απευθείας στο τέλος του ενδοδαπέδιου καναλιού

κάτω από το Gantry με επιπλέον ελεύθερο μήκος 2.0m, όπου θα συνδεθούν σε ξηρή επαφή. (Βλ. σχέδιο Ηλεκτρολογικά).

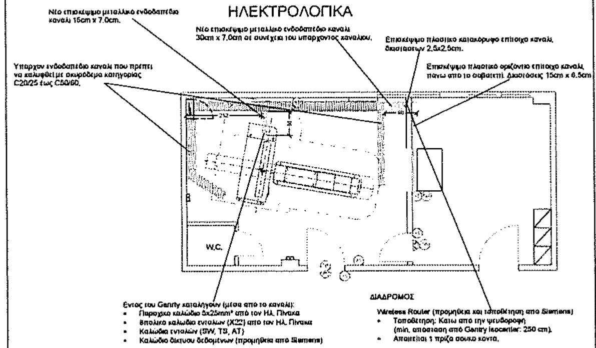
19. Εξασφάλιση συνθηκών κλιματισμού, σύμφωνα με τις αποβολές θερμότητας των μηχανημάτων:
    - αίθουσες Εξετάσεων ≈19.000 Btu/h και Χειριστηρίου ≈2.000 Btu/h
    - καθώς και των προδιαγραφών του πίνακα "Environment".

Σημείωση: Προκειμένου να ξεκινήσει η εγκατάσταση του συγκροτήματος, θα πρέπει να έχουν ολοκληρωθεί οι παραπάνω εργασίες και οι χώροι να είναι διαθέσιμοι, καθαροί χωρίς σκόνες και ασφαλείς για το προσωπικό που θα εργαστεί σε αυτούς.

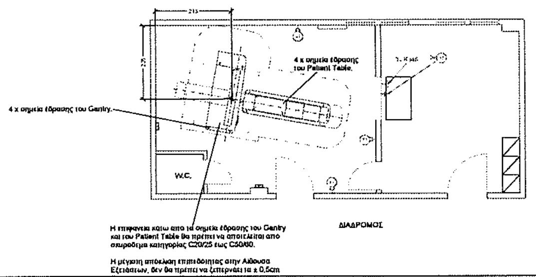
ΚΑΤΟΨΗ - ΠΡΟΤΑΣΗ



ΗΛΕΚΤΡΟΛΟΓΙΚΑ



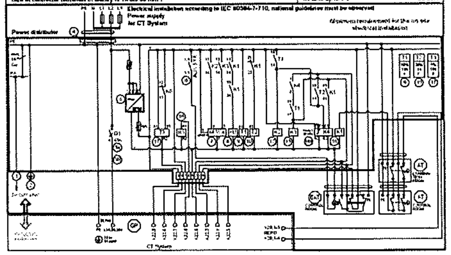
ΔΑΠΕΔΟ & ΔΙΚΤΥΑ



SOMATOM go.Up - Equipment Legend				
Pos.	Description	Weight, Heat dissipation to the air kg	W	Remark
1.01	Gantry with tablet remote control, computer and UPS	1280	5200	#1
1.02	Patient table Vario	387		* included in 1.01
1.03	Control unit with TFT monitor, control box, keyboard	9	75	
1.04	Wireless Access Point			optional
1.06	Camera and monitor for patient's observation			optional
1.08	Operating console (for control units)	31		optional
#1	Isocentre at 965 mm			

Electrical installation

Power supply SOMATOM go.Up					
Mains TN-S	3N/PE AC 50/60 Hz ± 2Hz	Line impedance	≤ 270 mΩ	Power consumption	
Voltage	400 V ± 10 %	On site circuit breaker	63 A	System	≤ 2 kVA
Only copper cables are allowed		Connection value	43.8 kVA	Standby / System off	6 kVA
Cable cross section is to be determined by national regulations. Size of connector terminals in Gantry is 16 bis 35 mm².				for time up to 8 s	50 kVA



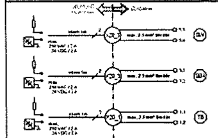
Legend electrical installation	
1	To external conductive parts
2	Test jack 4 mm pin plug
3a	Circuit breaker 100A Siemens 3VA1110-4ED46-0AA0
3R	residual current device RCD Siemens 3VA9114-0RL21 Room Group 1 300mA, Room Group 2 30mA
4	Overvoltage protection
5	24V DC power supply SITOP 6EP1436-2BA10
6	Auxiliary switch changeover contacts per Circuit breaker Siemens 3VA9988-0AA12
7	Side mounted motor per Circuit breaker 3VA 24V DC 3VA1117-0HB10
8	Undervoltage release for MCCB per Circuit breaker Siemens 3VA9908-0BB11
9	Timing relay 3RP2505-1AB30-0AC1
10	Timing relay Siemens 3RP2505-1AB30-0AC1
12	Contactor relay 24V DC 3RH2131-2BB40
13	Contactor relay 24V DC 3RH2131-2BB40
14a	Impulse switch Eltako ES 12Z-200-UC
16	Contactor relay 24V DC 3RH2131-2BB40
17	Timing relay Siemens 3RP2505-1AB30-0AC1
18	Output coupler Relay coupler Siemens 3RQ3018-2AM00-0AA0 (K5)
AT	Emergency off button with locking mechanism
EAT	On-off button with pilot lamp
HD	Connection box for REPO cable
GR	Gantry

Energy cables which do not belong to the system must be separated prior to fitting the unit cables (distance > 100 cm), or they must also be metallically shielded

Do not connect external components to the CT power supply line.

Energy cables which do not belong to the system must be separated prior to fitting the unit cables (distance >100 cm), or they must also be metallically shielded. For USA: PE is equivalent to Protective-GND and PA is equivalent to Transient-GND

Additional electrical connectivity for the customer in (GR)

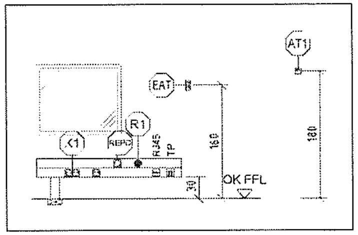


(GP) Gantry outlet for Power Distribution System (PDS)

(SW) Radiation ready indicator
Floating ground contact 250 VAC / 2 A or 24 VDC / 2 A.
The need for the installation has to be clarified with the local authorities.

(SBA) Radiation warning indicator IEC 60601-2-44 and CFR 21
Floating ground contact 250 VAC / 2 A or 24 VDC / 2 A.
The need for the installation has to be clarified with the local authorities.

(TS) Door switchlock for blocking radiation
Floating ground contact 250 VAC / 2 A or 24 VDC / 2 A.
The need for the installation has to be clarified with the local authorities.



Site preparation information

Transport Gantry

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

Gantry		
Standard transport:	transport rollers swiveled out	ca. 2748 x 1831 x 1864* mm (L x W x H)
Transport through narrow passages:	transport rollers swiveled in	ca. 3448 x 1540 x 1864* mm (L x W x H)

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

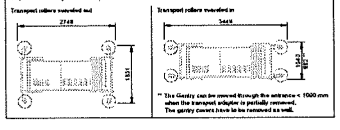
Tipping hazard! Transport with the rollers swiveled in is permissible only in narrow passages! As soon as the system has passed through narrow passages, the transport rollers have to be swiveled out again. Gantry with transport device 1400 kg, transport device 125 kg.

The maximum possible floor load (3-point load) per roller which may arise during gantry transport is 7.68 kN. If necessary, cover the transport route with metal sheets to distribute the load.

PHS Vario	Weight 600 kg	2650 x 830 x 1517 mm (L x W x H)

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

Top view Gantry with transport device



** The Gantry can be moved through the entrance < 1000 mm when the transport adapter is partially removed. The gantry covers have to be removed as well.

Environment

All CT components	Temperature Relative humidity Temperature (recommended) Relative humidity (recommended) Barometric pressure Temperature gradient	18 to 30 °C 20 to 75 % 22 to 28 °C 30 to 60 % 800 to 1060 hPa 5 K/h
Transport / storage	Temperature Relative humidity Barometric pressure Temperature gradient Maximum storage period	-20 to 50 °C 10 to 95 % 700 to 1060 hPa 10° K/h 2 months

If it is not possible to maintain these ranges, an air conditioning system with or without humidifier / dehumidifier should be installed. Temperature gradient 5 K/h. By intake of outside air it is recommended to install air filters (Class EU3 to EU4) for filtering dust particles of > 10 µm (DIN EN 779)

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 lighting

Ambient lighting in rooms with diagnostics or with workstations must comply with the respective local and national regulations.
General requirements (as 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).

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.

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 9241-6).

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 349.

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 access safety measures have to be put in place.
Clear visible markings according to national guidelines, e.g. creating warning signs, hazard warning tape, hazard area cordon, safety mats, may be required.

Room height

Technically required minimum room height 1880 mm (with Gantry arm 2180 mm)
Measured from the highest point of the finished floor (with covering) to the lowest point of the ceiling

Required room height when using a CARE Vision ceiling system must be observed!

Siemens Remote Service (SRS)

Siemens Remote Service (SRS) is used for remote diagnostics as well as remote service to provide highest system availability.
Requirements:
- Broadband connection (min 2 Mbit/s download, 512 kbit upload) without time or volume limitations
- Router (for exclusive use with SRS, a router can be obtained by Siemens for free)
Data protection and security is defined in the Siemens Remote Service security concept.

Network Integration

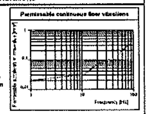
The Siemens components are using TCP/IP Protocol, a 100/1000 Mbit/s switched Ethernet network and static IP addresses.
The required network cabling (min. CAT 6 TP) has to be provided on site.
Media converters, which are needed for using fibre optic cabling, are not in the scope of Siemens delivery.
To 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.

Floor mounting information

Floor- and building vibrations

Floor- and building vibrations can reduce image quality!

Sources that produces vibrations are, e.g.:
Railroad routes, subways, roads, road works and construction sites, hospital power plants, mines, open-cast minings, quarries (explosions), lorry 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 vibrations have to be measured with a sampling rate of 1000 Hz.

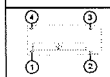


The CT system is not sensitive to common vibrations. If the CT is away from vibrational sources, or the CT is replacing a CT system that to date has not shown image quality problems due to vibrations, it is usually not necessary to execute vibrational measurements.

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.

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.

Statics

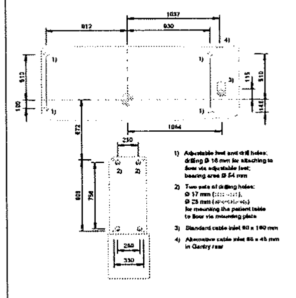


The floor construction has to be performed solid and free of vibration, e.g. concrete flooring C20/25 to C50/60 corresponding to DIN EN 206-1, according to the maximum values as specified in the textblock "Floor and building vibrations".
It is recommended to test the weight capacity of the concrete or 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: 1278 kg	Total static load (center of gravity): F_{total} = 12.78 kN				
Partial load on gantry foot number		①	②	③	④
Nominal static load after leveling	F_{static} [kN]	2.83	3.12	4.37	2.86
Maximum dynamic load (amplitude) during gantry rotation	$F_{dynamic}$ [kN]	± 0.3	± 0.3	± 0.3	± 0.3
Outer diameter gantry foot [mm]		54	54	54	54
Floor contact area gantry foot [cm²]		18	18	18	18

During gantry installation and leveling, the maximum possible load on one gantry foot can be 7.88 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).

Cable lead-in and floor mounting - Gantry with Patient table — 1:20



1) Adjustable feet and drill holes: drilling Ø 16 mm for attaching to floor via adjustable feet; bearing area Ø 54 mm
2) Two sets of drilling holes: Ø 17 mm; Ø 23 mm; for mounting the patient table to floor via mounting plate
3) Standard cable inlet 80 x 190 mm
4) Alternative cable inlet 85 x 45 mm in Gantry rear

Floor requirements: Gantry and patient table

- 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 text block "Floor and building vibrations". ESD flooring is not required for CT systems and CT options.
- NOTE: A solid and vibration-free floor is needed to avoid a negative influence on the vibration characteristic of the gantry. An incorrect vibration characteristic of the gantry can cause problems with balancing and image quality.
- Level in the area of the gantry and the table base. Permissible tolerance in levelness max. 10 mm referenced to the length of the gantry base.
- On-site substructures have to fulfil the flooring conditions
- It is recommended to test the weight capacity of the concrete or composite flooring by a stress analyst.
- Flooring in the area around the contact surfaces of the gantry and the patient table must be removed in the area around the patient table and gantry.
- Floor mounting, as well as principally every kind of CT system component mounting, must be performed in accordance with country-specific guidelines in countries prone to earthquakes.
- The gantry and the patient table have to be on the same (isocentric) plane.
- Cables should be routed to the gantry through the cable inlet in the right stand of the gantry.

Floor mounting Gantry

- Not required for system operation. Possible by anchoring/screw connections at the 4 adjustable feet. Only required according to the currently valid country guidelines, e.g. in countries prone to earthquakes. Installation material has to be provided on-site.
- Subgrade: Basically only concrete flooring/composite flooring, on-site mounting frame
- Stands on 4 adjustable feet. Leveling with 4 adjustable feet.

Floor mounting patient table

- As a rule, floor mounting of the patient table is required by the manufacturer. Add compensating plates (included in delivery volume). Installation material for floor mounting on concrete and a drilling template are included in delivery volume.
- Subgrade: Basically only concrete flooring / composite flooring ≥ 140 mm; composite flooring up to max. 125 mm strength; Floating screed with sub-construction only; on-site mounting frame; Access floor with sub-construction only
- Required concrete thickness: min. 140 mm (when using the delivered HILTI anchors)
- Required extraction force min. 4.2 kN per fastening point. According to IEC 60601-1, a factor of 4 safety margin is mandatory.
- Positioning and leveling as given on table base.

First creation			
Creation / Modification (9)			
Siemens Healthineers Project Management and Planning Leof. Kifisias 284, Chalandri			
Tzaneio General Hospital			
Piraeus		Room height finished floor to Concrete Ceiling Suspended Ceiling	
CT Somatom go.Up		Scale	1:50