gKteso

TECHNOLOGIES & SOLUTIONS

Radiotherapy Patient System
`RPS base` by gKteso
6 DoF Robotic Couch System
for Radiotherapy Cancer Treatments

RPS base

6 DoF Couch
for more precise
radiation
treatments.

Description and essential performance features of the 6 DoF robotic couch system

The RPS base features a full robotic patient-positioning platform with six degrees of freedom. It enables accurate and remote geometric correction of any misalignments detected by state-of-the-art image guidance systems, thereby closing the gap in the 6 DoF-chain of IGRT localization and tumor isocenter targeting. The RPS base replaces the existing patient couch.

The RPS base allows sub-millimeter patient positioning accuracy in six degrees of freedom, improving clinical workflow and patient confidence. 6D means that the system can correct translational errors (x, y, z) in patient positioning as well as rotational errors (roll, pitch and yaw).

An internal sensor system which monitors the couch's position is also part of RPS base system, allowing closing the control loops for patient positioning.

All movements can be controlled either by a handheld controller next to the couch in the treatment room or by a software application.

The RPS mini features the latest carbon fiber composite tabletop solutions with lowest possible attenuation.

Intended use and intended user

The RPS base is intended to be used for accurate patient positioning within a radiation therapy treatment environment. It comprises of:

- The RPS base to support and aid in positioning a patient and
- A software to control the RPS base position.

Indications:
The RPS base supports and controls in positioning a patient during radiation therapy of various body regions. The system is not restricted to certain sub-populations (e.g., those defined by age, sex, ethnicity and organ function and disease severity or similar).
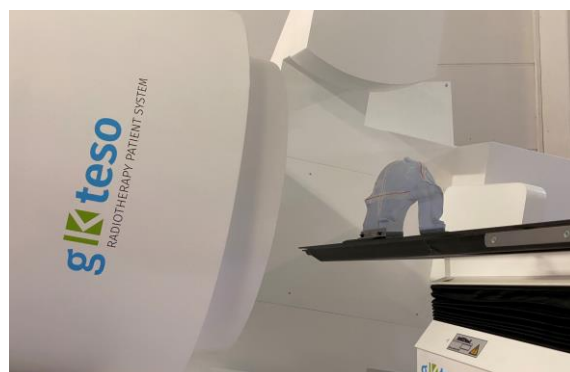
6 DoF Robotic system specifications

Axis	Range	Speed	Absolute positioning accuracy	Corrective position accuracy
Vertical movement	64 – 151cm 25" – 59"	0 – 50mm/s 0 – 2"/s	±0,5mm ±0.02"	±0,1mm ±0.004
Lateral movement	±250mm ±10"	0 – 50mm/s 0 – 2"/s	±0,5mm ±0.02"	±0,1mm ±0.004
Longitudinal movement	±570mm ±22"	0 – 80mm/s 0 – 3"/s	±0,5mm ±0.02"	±0,1mm ±0.004
Pitch rotation	±5°	0 – 1°/s	±0,1°	±0,05°
Roll rotation	±5°	0 – 1°/s	±0,1°	±0,05°
Yaw rotation	±5°	0 – 1°/s	±0,1°	±0,05°
I axis (optional)	±100°	0 – 5°/s	±0,1°	±0,05°

Couch specifications

Mode of operation	continuous
6D translational and rotational corrections	simultaneously
Isocenter accuracy at isocenter height	<2,0 mm / <0.1"
Typical couch deflection (IEC60976)	<2,0 mm / <0.1"
Maximum weight of patient	250kg / 550lbs
Dynamic isocenter	yes – optional
External reference system (camera system)	no
Side panels	Motor STOP Power failure lowering
Hand Held Controller	Digital display absolute Motion enabeling Speed selection Home positions Preset Positions RFID functions
Operating from outside room	Software interface
Remote Enable Controller	Motion enabeling
Interlocks	Touch guide HT Illegal motion Motor STOP

Couchtop specifications

Material	non-conductive Carbon fiber
Length	260cm 102"
Width	53cm 21"
Indexing system	14cm 5.5"
Attenuation (% by 6MV)	>2,4%
Changeable	Yes/ custom specified
Accessories	Metal side rails

Power Supply

Mains	
(VAC)	100 – 230 ±15%
(Hz)	50 / 60
(A)	20A / 100V 10A / 240V

Internal Power	
(VAC)	Max. 48
(A)	Max. 20

Conformity

The RPS base complies with the fundamental requirements of European Regulation 93/42 EEC for class I medical products and has been developed and tested in accordance with the following standards:

- IEC 60601-1:2012 (edition 3.1) - including US and CA
- IEC 60601-1-2:2014 (edition 3.0) - including US and CA
- IEC 60601-1-6:2013 (edition 3.1)
- IEC 60601-2-1:2009 (edition 3.0)
- IEC 60601-2-54:2009 (edition 1.0)
- IEC 61217:2011 (edition 2.0)
- IEC 62304:2006 (edition 1.0)
- IEC 62366:2014 (edition 1.1)

Key Features

- **Complete patient couch with 6 DoF** – one integrated device
- **Integrated iso-centric movement (optional)** – automatic full patient positioning
- **High accuracy** – due to build-in redundant sensor system
- **Closed loop-solution** – No need for external camera system
- **Integration of gantry control (optional)** – for movement in non-coplanar treatment
- **Customer specified tabletop** – or standard 14cm indexed tabletop with side rails
- **Low patient entrance height** – 64cm
- **Patient weight** – up to 250kg
- **Dynamic isocenter** – all rotations about patient unique fixed or virtual isocenter
- **Software application interface** – for simple workflow integration
- **Simultaneous 6 DoF translational and rotational correction**
- **Large 6 DoF movement range** – ±5 degrees in roll, pith and yaw
- **Continuous fast movements** – prepared for motion management solutions

Patient positioning without compromises

Big correction areas

Free choice of accessories