D2RS 9090

TECHNICAL SPECIFICATIONS

D2RS 9090 REMOTE CONTROLLED TABLE

WITH CANON B1 FPD

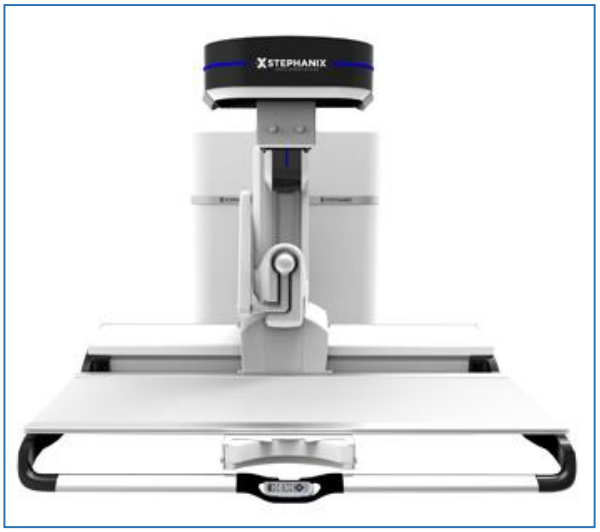
STEPHANIX
MEDICAL IMAGING SOLUTIONS

D2RS 9090 REMOTE CONTROLLED TABLE

It consists in three main parts:

- The remote controlled table with flat tabletop to facilitate patient positioning,
  the column that supports the tube with automatic collimator, the detector tray and integrated electronics (instead of a separate control cabinet)
- The main console that includes all the controls for the remote table, the touch screen interface with the generator, the camera and the acquisition console for auto-positioning
- The secondary infrared remote console with the main controls of table

PATIENT SUPPORT



Motorised ***variable height,*** 6 cm /s, **from 38 to 148 cm**
The flat ***tabletop,*** 225 x 81 cm (60 cm radiolucent) with rails for accessories, has a large width for convenient positioning and centring, above all for bariatric patients. It is composed of carbon fibre with low absorption of 0.55 mm Al eq. Maximum patient weight according to IEC 60601-1 standards, up to 230 kg for all movements without any limitation, and up to 310 kg with some restrictions.
Motorised lateral movement, +/- 18 cm at 6 cm /s.
Motorised longitudinal movement, +120/- 60 cm (other inferior values on request) at 8 cm /s
Tilting **of + 90° / - 90°,** motorised at 6° /s

The composite footrest, as standard accessory, can stand up to 230 kg and its maximum width of 40 cm permits profile exams with optimum comfort and safety for the patient.
Its radiolucent upper part in its 46mm thickness allows seeing the whole feet with soft tissues for weight-bearing exams. Its lightweight and specific design make it easy to handle with one hand

DETECTOR SUPPORT

Longitudinal movement of 135 cm, motorised at 14 cm /s.
Total patient coverage under X-ray all over the tabletop (including tabletop movements)
One unique removable carbon grid R10/1, focused at 125 cm.

TUBE SUPPORT

Motorised ***angulations***, +/- 40° (10°/s maximum) even at the end of table, for specific procedures and direct exposures with tube rotation

Curvilinear ***tomography*** in one direction, choice of three angles during installation from 8° to 40°
Layer thickness: 1.5 mm (at 40°), 3 mm (at 20°), 6 mm (at 10°)
Maximum speeds per angle: 0.5 s (10°); 1 s (20°); 2 s (40°)
Layer height from 0 to 300 mm, by step of 1 mm, displayed on the main console, automatic increment and decrement

Motorised ***Source-Image Distance***, 6 cm /s, variable continuously from 110 cm to 180 cm

Manual ***tube rotation*** +/- 180°, electrically assisted, with electromagnetic brake to choose any tube angulation, and mechanical stops every 90°: that permits, with table in vertical position, to make exposures on stretcher or on Wall Bucky regarding the configuration

Motorised collimator fitted with four pairs of mobile lead shutters and two pairs of pre-shutters. Minimum inherent filtration 2mm Al eq; additional variable filtration (1mm Al + 0.1mm Cu or 1mm Al + 0.2mm Cu or 2mm Al) can be pre-programmed in each protocol like paediatrics …) . Equipped with LED light beam (160 lux @ 1m @ 14"x14") and laser indicator, it can be rotated manually by **+/-45°** (option).

In automatic mode, shutters are opened regarding detector format, anatomical region (APR), auto-positioning and selected fluoro / graphy field
Manually, from the main console with the proportional joystick or with remote handswitch or from the collimator, it is possible to adjust more precisely the collimation to the needed area to xray.
For dose reduction, automatic collimation and filters are predetermined in each protocol and a ***video camera*** permits to position the patient without irradiation. Touch screen of main table console displays these video images

Retractable motorised ***compression device*** (option).
The paddle can apply up to 200N compression (130N factory setting) when the column is in the incidences range of -10°/+10° and its minimum distance with the tabletop can be 10cm.
Patient safety systems:
- inhibit tabletop, carriage and angulation movements when compression is in use and superior to 60 N.

- permit to disengage the compression device manually when the table is switched off from mains supply while the patient is under compression

MAIN CONTROL CONSOLE

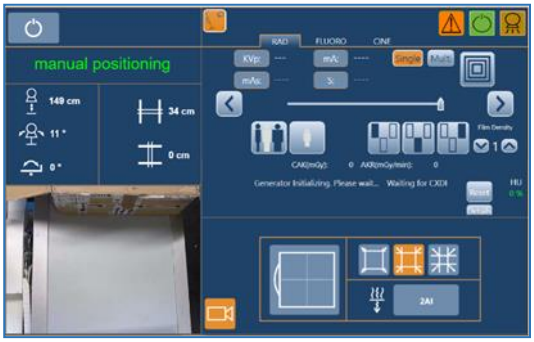
Sensitive capacitive keys and joysticks make controls, capacitive touch screen permits to select table & generator parameters, to display system information and video images on the same page; MOVE button to engage auto-positioning regarding selected anatomical protocol and table parameters; buttons for Prep and x-ray and.

Keys are arranged in functional order: column angulation at 0°, table tilting in parking position, longitudinal & lateral tabletop movements reverse, reset position. The collimator automatic mode and lighting are close to the joysticks. The light keys have a stronger light when pressed on them.

Joysticks control the SID, the angulations, the table tilting, variable height, carriage, tabletop lateral movement and collimator shutters in continuous mode.

The secondary console (option) is mobile in the X-ray room and offers almost the same controls as for the main console. It allows triggering the emission of X-rays, but it is not possible to perform generator parameters settings.

The consoles include an emergency switch and two others on detector support.
The movements can be simultaneous according to the room limitations set by software.
Internal computer controls anti-collision safeties through auto-positioning



Capacitive colour 10" touch screen displays displays the following items on same page: generator parameters settings, the system position and collimation, positioning camera, detector position & fluoro zoom, system information. On this screen appear the following: SID value, the column angulations, the collimation size, the fluoro field zoom, the tilting value, and the detector format (portrait/landscape), the error / warning messages.

In tomography mode, it informs about the layer height, the automatic increment …
In tomosynthesis mode, it informs about the layer height, the scanning angle, the desired number of exposures, the number of frames per second during acquisition, the scanning duration.

The major functions are available in the room using the infrared remote handswitch (standard accessory)

HIGH FREQUENCY GENERATOR

The generator is made of an electronic cabinet including HV tank, generator application software is integrated in table console. The generator is microprocessor controlled and uses the Inverter technology with IGBT circuits (Insulated Gate Bipolar Transistor). *Three powers are available, 50kW, 65kW (in standard) or 80kW*

Nominal output: 65 kW according to EN 60336 standards at 100 kV during 0.1 s,
constant potential high frequency generator
Maximum power line impedance: 0.135 Ohm
Inverter frequency: 25 kHz
Ripple rate: < 1 kV at 100 kV
Maximum voltage at the maximum current: 100 kV at 650 mA
Maximum current at maximum voltage: 400 mA at 150 kV

Radiography parameters:

From 40 to 150 kV, by step of 1 kV (or displacement in the range by slider), accuracy ± (3% + 1 kV)
From 10 to 650 mA, accuracy ± (4% + 1 mA), 19 values
(10, 12.5, 16, 20, 25, 32, 40, 50, 65, 80, 100, 125, 160, 200, 250, 320, 400, 500, 650)
From 1 ms to 10 s, accuracy ± (2% + 0.1 ms), 38 values
1, 2, 3, 4, 5, 6, 8, 10, 12, 16, 20, 25, 32, 40, 50, 65, 80, 100, 125, 160, 200, 250, 320, 400, 500, 650, 800 ms and 1, 1.25, 1.6, 2, 2.5, 3.2, 4, 5, 6.5, 8, 10 s
From 0.1 mAs to 500 mAs

Fluoroscopy parameters:
From 40 to 120 kV, by step of 1 kV, accuracy ± (3% + 1 kV)
From 0.5 to 5 mA (low dose) and up to 7 mA (higher dose)

Operating modes:
999 customizable anatomical protocols / 3 points (kV, mA, s) / 2 points (kV, mAs) / 1 point (kV, AEC)

AEC

Installed in the detector tray, the ionization chamber is an x-ray sensor designed for automatic exposure control regarding selected kV in One point mode. It will optimize image quality with patient dose reduction. The three rectangular fields are composed of solid-state detectors; the central one is slightly lower positioned.
Dimensions of active areas: 2 x (90 x 40) mm + 1 x (100 x 40) mm
Sensitivity difference between sensor fields: < 10 %

X-RAY TUBE

Several types and brands of X-ray tubes are available. Standard is RTM101 with C100XT housing from IAE

X-ray tube information: high-speed starter and one tube output

To ensure proper operation and better x-ray tube life:

- Presetting of x-ray tube features:

Loading ratings, cooling ratings, starting voltages, starting times, maximum current limitation

- Safety and protection disposals for x-ray tube:

The electronic calculation of load by software indicates limits to the tube with message and forbids x-ray emission

Housing temperature control and display of available Heat Units in %

Overheated IGBTs detection

Housing oil pressure control in series with x-ray tube heat safety

RTM 101 X-ray tube

Nominal focal spots values:	0.6 and 1.2 mm
Anode rotation speed:	9,000 rpm
Nominal anode input powers:	40 and 100 kilowatts
Anode diameter:	102 mm
Anode material:	Rhenium - Tungsten - Molybdenum
Anode angle:	12.5°
X-ray coverage at 1 m:	43 x 43 cm
Inherent filtration:	0.7 mm
Radiation protection:	complies to IEC 60-601-3 standard
Anode heat storage capacity:	400kHU (285kJ)
Anode heat dissipation rate:	1,000 W (81.1 kHU /min; 60 kJ /min)
Housing:	***C 100 XT***
House heat storage capacity:	2,025 kHU (1,000 kJ)
Housing heat dissipation rate:	1,000 W (81 kHU /min; 60kJ /min) with fan
Cooling:	Air
High Voltage cable length:	12 meters

DOSE AREA PRODUCT MEASURING SYSTEM

It consists in a transparent ionization chamber and its integrated detector electronics, installed at the level of the collimator. The acquisition console has a dedicated zone to display Dose Area Product and registration is done in the patient study for each exposure or whole study.

Active area: 146 mm × 146 mm

Measuring range: up to 99,999,999 Gym²

Transparency: > 75 %

WIFI DYNAMIC B1 LARGE FIELD FLAT PANEL DETECTOR

The remote controlled table is equipped with the B1 Flat Panel Detector (ASi technology and Csi). This portable and WIFI detector allows radiographic, digital/cine and fluoroscopic examinations into the table and can be removed for specific projections and direct exposures on stretcher /bed.

Matrix dimensions 2,656 x 2,592 pixels, 160-µm pixel size

Up to 16" x 17" image 20 Mb

weight 3.5 kg

IP57

Fluoroscopy, specific post-processing

Up to 15 images / sec. in 42 x43 cm

Up to 30 images / sec. with 23 x 23 cm field

ACQUISITION CONSOLE

The user interface allows creating and modifying up to 999 customizable anatomical protocols regarding the needs of x-ray department; choice of image display and post-processing, sending to network or printer

Each anatomical body part receives a specific image processing regarding the protocol. Moreover, LUT curves are available as chest, linear, linear reverse, standard contrast….

The large dynamic range of Flat Panel Detector gives numerous pieces of information that the specific algorithm facilitates to recover. It enables corrections for under-exposed and over-exposed images and enhancement for bone. This algorithm allows the visualization of bone and soft tissues, lung and mediastinum. It improves the visualization of C7 and T1, spine, pelvis and extremities.

Windowing (brightness and contrast) can be manual or automatic regarding the ROI.

Programmable annotations like hospital name, radiologist name, date, hour, patient data (name, DOB…), and parameters … free annotations.

The ***computer*** works with Windows 10 Pro operating system, Intel Core I5, 64bits, RAM 16Go, one 128 Go SSD for software and 1 To for image storage. 4 Go graphical board, Ethernet network board, CD/DVD writer (minimum features). *STEPHANIX allows the right of modifying these features without prior notice regarding the evolution of the technologies*

TFT Colour LCD monitor with a 21" diagonal, optimum resolution 1,200 x 1,600 pixels, contrast 1500:1, brightness 420 cd /m² max, vertical frequency from 59 to 61 Hz and horizontal one from 31 to 76 kHz

The system management includes image processing, temporary archiving on hard disk, image sending on network.

DICOM Compatible Store, Print, Worklist, MPPS, Storage commitment, RDSR and Media Export.

AUTO-POSITIONING

Choice of programmed protocol (where table and generator parameters were determined) on acquisition console

Transmission to table console

Press MOVE button to position automatically the table regarding entered parameters:

- tabletop tilting
- column angulation
- SID

When the table reaches the position, a message appears and the system is ready for the examination

OPTIONS

Touch screen on acquisition console or/and on LCD in X-ray room
Grid focused at 110, 180 cm
Second monitor
Additional portable and wireless Flat Panel Detector 17”x17”, 14”x17” or/and 10”x 14”
Accessories (see below)
Automatic stitching (image pasting) software to install on acquisition console or visualisation console
DSA, tomosynthesis
Ceiling tubestand
Other options on request

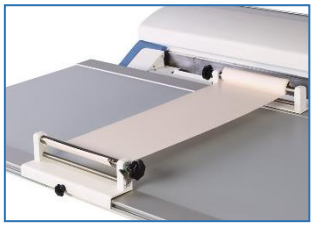
STANDARD ACCESSORIES

One composite footrest

One adjustable stool

Two patient handles

Two winches & one belt



Two double fluoroscopy pedals

OPTIONAL ACCESSORIES *(Others on request)*

Triple fluoroscopy pedal

Retaining bar

Pair of shoulder rests

IV-Pole

Ruler support for stitching

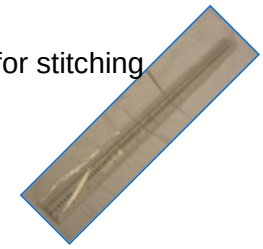
Cup holder

Multi FPD lateral support

Pair of leg supports

Pair of gynaecology stirrups

1m ruler for stitching



10cm ruler for measuring

EQUIPMENT ENVIRONMENT

Dimensions (L x w x h) and weight

Table 226 x 235 x 189 cm minimum, in horizontal position, lower height, minimum SID, column at 0°, 1600 kg

Table cabinet integrated into the table

Table main console 600 x 270 x 120 mm, 15 kg

X-ray tube 524 x Ø 190 mm, 29 kg

Generator cabinet 592 x 360 x 690 mm, 95 kg

Generator control interface integrated into table console

Flat panel detector 460 x 460 x 16 mm, 3.5 kg

Acquisition console /computer 360 x 310 x 100 mm, 9.8 kg

Acquisition console / colour LCD monitor 465 x 209 x 453 mm, 9.7 kg

Operating environmental conditions

Temperature from 10°C to 35°C (the temperature has to change progressively)

Relative humidity from 30% to 75% (not condensing)

Atmospheric pressure from 760 to 1060 HPa

Power supply

Generator: 400 / 480 V ac +/- 10%, three phases, 50 / 60 Hz

Table: 230 V ac +/- 10%, single phase, 50 / 60 Hz

Digital system by FPD: 120 / 230 V ac +/- 10%, single phase, 50 / 60 Hz

For 60 Hz frequency, the power is provided via an optional three-phase transformer 480V+N / 400V+N, 60 Hz, 12kVA are provided

Protection

Generator: 63 A circuit breaker, D power line, with 30 mA differential sensitivity

Table: 20 A circuit breaker, D power line, with 30 mA SI differential sensitivity

Digital system by FPD: 2 x 16 A circuit breaker, D power line, with 30 mA differential sensitivity