

# Product Data

# Neo C+ arm R9

X RAY SYSTEM



# Neoo **C+** *arm* R9

X RAY SYSTEM

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## Premise

This document was created by IBIS in order to provide its customers and / or potential new customers with all the necessary information on the products; the purpose of this document is to group all the technical specifications of each device created by IBIS.

However, it is necessary to take into account that, according to the model chosen, it is possible to use different electrical, mechanical or radiological components which can be listed in the product technical dossier.

In the case of special requests, therefore, we invite you to contact our technical service that will send you all the details and technical specifications related to the configuration you have chosen.

The specifications indicated in this document refer to standard configurations.

IBIS designs and manufactures medical x-ray equipment for both the human and veterinary sectors. The human range includes Mobile Units, complete Radiology rooms, "C" arms for fluoroscopy examinations, Image Intensifiers and portable generators; for the veterinary sector we produce the CDR vet tables used both in multifunctional clinics and in veterinary clinics, "C" arms for clinics and portable units useful for in-field diagnostics or for radiological examinations on large animals.

The company operates worldwide through distributors that provide the end customer with direct technical support; all internal and external technicians are properly trained to solve any hardware and software problems.

The strong points of IBIS are the continuous commitment to develop new products, the relationship with the customer, the great reliability of the products and the technical assistance.

IBIS, as a manufacturer of imaging equipment, is constantly improving its products; we therefore invite you to download the most up-to-date revision concerning the product of your interest from the website [www.ibisray.it](http://www.ibisray.it).

If you need further technical details you can contact our technical department by contacting us by phone or by sending an e-mail to [technical@ibisray.it](mailto:technical@ibisray.it); one of our technicians will answer you and give you all the required details.

## Company data and contacts

Below are the references to contact our staff:

### IBIS S.r.l.

Headquarters: Via Cascina Bruciata, 3 – Seriate Bergamo – ITALY

Phone: 0039 035 4236343

Sales Department :

[sales@ibisray.it](mailto:sales@ibisray.it)

Technical Department :

[technical@ibisray.it](mailto:technical@ibisray.it)

Technical Assistance :

[service@ibisray.it](mailto:service@ibisray.it)

Quality Department :

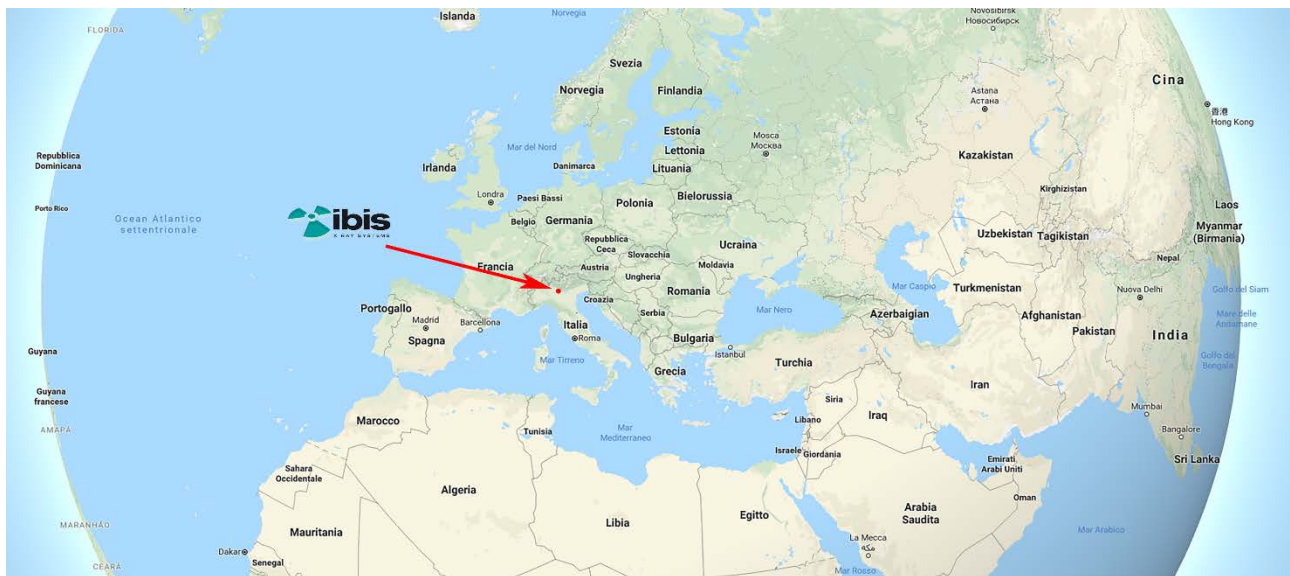
[quality@ibisray.it](mailto:quality@ibisray.it)

Administration :

[administration@ibisray.it](mailto:administration@ibisray.it)

General Information:

[info@ibisray.it](mailto:info@ibisray.it)



## General description

(Valid for the whole Neoo range)

Neoo "C" Arm is easy to move, position and use and is expressly designed for use in surgery, orthopedics, traumatology, abdominal surgery, urology. The radiological techniques available in the most complete version are:

*Continuous fluoroscopy*

*Pulsed fluoroscopy*

*One Shot Fluoroscopy*

*Continuous, pulsed and one shot low dose fluoroscopy*

*Radiography with cassette.*

The unit consists of a monitor trolley and a base with a "C" arm supporting the monobloc and the image intensifier.

The unit is supplied with a 40 kHz RX generator with 120 kV rotating anode tube (**Neoo R9 / Neoo R12**) or with a fixed 110kV anode (**Neoo S9 / Neoo S12**). Image intensifier 9 "and 12" with 3 fields zoom.

The maneuverability of the Neoo unit is facilitated by twin wheels and a steering system integrated into the main chassis. The brakes guarantee the stability of the equipment and prevent accidental movements during use or parking.

Every movement, from the revolution to the orbital rotation, can be locked by clamping levers.

The vertical movement is ensured by a powerful linear motor, which allows an excursion up to 450 mm, which can be controlled via the on-board control panel.

The Neoo unit is equipped with a separate monitor trolley that can be positioned at will to guarantee the operator an optimal view of the exam he is performing.

The trolley carries 2 19" high resolution monitors able to move freely; the possible excursions of the monitor also depend on the type of monitor but in general, for all the available versions, it is possible to tilt up and down, rotate sideways up to +/- 90 °, raise and lower.

On the monitor holder trolley there is a comfortable keyboard and a mouse to use the functions offered by the RTP system (optional). On the cart you can find also, depending on the version and options chosen, a DVD slot and a thermal printer available in both A4 and A6 format.

The monitor trolley can be easily positioned thanks to four wheels, 2 of which with brake.

The Neeo system integrates a high contrast touch screen system (can also be used with work gloves) that allows immediate viewing of all exposure data. Thanks to the ease of use of the integrated digital system, the user can quickly modify the exam data and see the variations related to the exposure on the monitors. On the touch screen display is also possible see messages of any abnormal conditions (microprocessor management).

The Neeo series maintains the use of Image Intensifiers that have, for many years, guaranteed a soft image with very high details.

The wide range of combinations makes the Neeo system fully customizable according to the needs of the individual customer, clinic or hospital.

Among the various available options you can find:

- 625 lines CCD camera
- 1K x 1K high definition Camera
- SBFM board - 110 volatile images
- SBFM board 330 or 2700 with non-volatile images with digital rotation, 100 Hz video out and keyboard
- RTP Real Time Processing NW
- Dosimetric system
- Stainless steel cassette holder
- Cross laser locator
- Sony Thermal printer A4 format
- Sony Thermal printer A6 format
- Sterile drapes

The monitors that can be used vary depending on the memory board chosen: for the SBFM boards must be used a medical grade monitor B/W or Color with BNC input.

With the RTP it is possible to use the high definition monitors with DVI or VGA input among those proposed on the price list. The choice is entrusted to the customer according to the needs.

Dicom features: **D**igital **I**maging and **C**ommunications in **M**edicine (available only with RTP):

- DSA (*Digital Subtraction Angiography*)
- QA (*Quantitative Analysis*)
- HCF (*High Contrast Fluoroscopy*)
- Dicom BASE Verify and Storage
- Dicom PRINT Print on a DICOM Printer \*
- Dicom WORKLIST \*
- Dicom MPPS (*Modality Performed Procedure Step*)
- Dicom STCOMMIT (*Storage Commitment*)

- Dicom QUERY/RETRIEVE
- Dicom CD/DVD \*

*\* Dicom Print, Worklist and CD/DVD must be used along Dicom BASE*

## Functional details of the RTP software

### **DSA Digital Subtraction Angiography**

DSA is a [fluoroscopy](#) technique used in interventional radiology to clearly visualize blood vessels in a bony or dense soft tissue environment. Images are produced using contrast medium by subtracting a "pre-contrast image" or *mask* from subsequent images, once the contrast medium has been introduced into a structure.

The "subtraction" of the acquired pre-contrast image is performed autonomously by the RTP system software.

### **QA Quantitative Angiography**

Angiographic measurement is used in cardiac imaging, for example for the measurement of coronary stenosis, or for measurements of blood vessels or for atherectomy operations for the disruption of the coronary arteries.

### **HCF High Contrast Fluoroscopy**

This function greatly increases the contrast of the image and consequently the improvement of the image.

#### **Dicom BASE**

The service is used to send images or structured reports, etc. to a PACS or workstation.

#### **Dicom PRINT**

The DICOM Print service is used to send images to a printer with DICOM protocol.

#### **Dicom WORKLIST**



Allows one of the Dicom modes to obtain patient details and the exams worklist, avoiding having to manually type this information and obviating any typing errors.

### **Dicom MPPS**

Modality Performed Procedure Step, more commonly known as MPPS, supplies a mechanism to pass information about images which are transferred to the Server. An MPPS object contains all of the data concerning the study, the procedures carried out and the series/images created during the execution of a procedure. MPPS management can be activated or deactivated for every study. Activation depends on the configuration of the machine (see MPPS Setup restricted to the installing technician) and on the presence of the software option in the key.

### **Dicom STCOMMIT**

The Dicom service of Storage Commitment allows a Dicom device that has transferred images to another device (normally a workstation or an archive), to make the second device responsible for the storage of the images. Once the notification of acceptance has been received, the first device is free to do as it wishes with the images, including delete them.

### **Dicom QUERY/RETRIEVE**

QR allows the RTP module to find lists of images or other objects and then retrieve them from a PACS.

### **Dicom CD/DVD**

Dicom CD/DVD allows to store images and related diagnostic information on removable media including information contained in Meta files.

## Neoo Series Versions

The Neoo range includes the following versions:

### Neoo R9

9 inches Image Intensifier with three fields  
3,5 kW Power Generator - Rotating Anode

### Neoo R9

9 inches Image Intensifier with three fields  
5 kW Power Generator - Rotating Anode

### Neoo S9

9 inches Image Intensifier with three fields  
3,5 kW Power Generator - Fixed Anode

### Neoo R12

12 inches Image Intensifier with three fields  
5 kW Power Generator - Rotating Anode

### Neoo R12

12 inches Image Intensifier with three fields  
3,5 kW Power Generator - Rotating Anode

### Neoo S12

12 inches Image Intensifier with three fields  
3,5 kW Power Generator - Fixed Anode

## Product Specification: Neeo R9

Neeo R9 mount a monoblock with rotating anode and use the 2 points technique (kV-mAs) in radiology mode and the automatic technique (or 0 points) to control kV and mA on fluoroscopy mode. The values can be viewed on the large touch screen display.

Through the acquisition system with SBFM image processor or RTP system it is possible to use one of the following working modes: continuous fluoroscopy, pulsed fluoroscopy and one shot fluoroscopy.

The unit allows the selection of the electronic zoom according to the number of fields of the I.I. In this case the iris collimator automatically limits the RX field according to the field I.I. selected.

As per regulations, all the radiological units of IBIS can be equipped with a dosimetric system. Patient data can be entered via the virtual keyboard and then printed, with the related dose values acquired, for appropriate archiving.

If RTP is used, patient data can be entered via the keyboard and then printed or sent to the PACS with the related dosimetric data.

**ATTENTION:** for the correct use of the equipment refer to the user manual of the product.

## Radiological and Electrical Characteristics of the Product

### Neoo R9

#### Radiological and Electrical Characteristics of the Product

#### Generator

##### Radiological Features

<b>Generator Power</b>	3,5 kW	5 kW
<b>kV Range</b>	40-120 kV	
<b>Max mA on one-shot fluoroscopy</b>	12 mA	
<b>mAs Range</b>	1-250 mAs	
<b>Max Monobloc Current (piloted)</b>	65 mA Radiography– 12 mA Boosted	
<b>Total Filtration</b>	>2,7 mm Al	
<b>Additional Filtration</b>	Not removable – 1mm Al	

#### Monobloc

<b>Monobloc Type</b>	E 40R HF
<b>Ripple Monobloc at Max Power</b>	1%
<b>Max Current of the Monobloc (fluoroscopy)</b>	5 mA - 10 mA (in pulsata) – 12 mA One Shot
<b>Max Current of the Monobloc (radiography)</b>	100 mA
<b>Focuses dimension</b>	Small Focus 0,3x0,3 mm Large Focus 0,6x0,6 mm
<b>Thermal Capacity of the Monobloc</b>	900 kJ - 1200 kWh
<b>Continuous Thermal Dissipation of the Monobloc</b>	60 W
<b>Available Thermal Capacity (X-Ray)</b>	300 kJ
<b>Additional Filtration</b>	Not removable – 1mm Al

#### Tube

<b>Insert Type</b>	<b>IAE X20 P</b>
<b>Focuses dimension</b>	0,3 – 0,6 mm
<b>Type of tube</b>	Rotating Anode
<b>Anode speed</b>	3000 rpm
<b>Anodic Angle</b>	10°
<b>Maximum Thermal Capacity of the Insert</b>	150 kJ - 200 kWh
<b>Maximum Capacity Dissipation of the Insert</b>	300 W

**Power features**

<b>Main system power supply voltage</b>	Single Phase, 230 Vac +/-10%	
<b>Frequency</b>	50/60 Hz	
<b>Maximum Current Absorbed</b>	In fluoroscopy	6 A – 230 Vac Fluoro Pulsed
	In Radiography	22 A – 230 Vac Radio Pulsed
<b>Line compensation</b>	Automatic	
<b>Line resistance</b>	0,4 ohm	

**Neoo R9**
**Collimator characteristics**

<b>Model</b>	RALCO R605 DASM
<b>Shutters</b>	2 pairs of mobile leaded shutters with variable opening and rotation
<b>Dimensions</b>	210 x 98 x 94 mm

**Iris** Control from console, with adjustable opening to the maximum allowed depending on the Image Intensifier fields.

**Neoo R9**
**Image Intensifier characteristics**

<b>Model</b>	TOSHIBA E5764D P4A	THALES TH 9428 HP2
<b>Useful Entrance Field Size</b>	215 mm / 160 mm / 120 mm	215 mm / 160 mm / 120 mm
<b>Output Image Diameter</b>	20 mm ± 0,5 mm	20 mm
<b>Central Resolution</b>	48 lp/cm, 56 lp/cm, 66 lp/cm	48 lp/cm, 56 lp/cm, 64 lp/cm
<b>Contrast Ratio on large area</b>	25:1	23:1, 25:1, 30:1
<b>DQE Detective Quantum Efficiency</b>	65% (IEC Standard)	65% (IEC Standard)
<b>Conversion Factor (Gx)</b>	240 Cd/m <sup>2</sup> /mR/s	240 Cd/m <sup>2</sup> /mR/s

**Neoo R9**
**Grid characteristics**

<b>Grid Ratio</b>	8:1
<b>Grid shutters</b>	40 L/cm (103 L/inch)
<b>Focusing of the Grid</b>	90 cm

**Neeo R9**
**Cameras characteristics**
**Camera CCD 625 lines**

<b>Sensor Type</b>	CCD, High Resolution 1/2" Low Lag
<b>Video Standard</b>	CCIR: 625 lines interlaced, 50 Hz EIA: 525 lines interlaced, 60 Hz
<b>Pixels</b>	752(H) x 582(V), 50 Hz 768(H) x 494(V), 60 Hz
<b>Band width</b>	14 MHz
<b>Scan Ratio</b>	4:3
<b>Signal / Noise Ratio</b>	40 dB at 0.12 lux
<b>Video Signal Amplitude</b>	1 Vpp Max

**CCD Camera Thales 1024 x 1024**

<b>XRII Output Diameter</b>	25,2 mm
<b>Image resolution</b>	1000 x 1000 Pixels
<b>Digital Video Output</b>	12 bits
<b>Maximum frame speed</b>	30 fps
<b>Minimum exposure time</b>	33 ms @ 1000x1000
<b>Sensitivity</b>	Motorized Lens >64 LSB/Cd/m <sup>2</sup> Manual lens >18 LSB/Cd/m <sup>2</sup>
<b>MTF</b>	Motorized Lens ≥ 50% Manual Lens ≥ 40%
<b>Iris Aperture Range</b>	Motorized Lens: from F/1.5 to F/11 Manual Lens: from F/2.8 to F/11

**Neoo R9**
**SBFM Single Board Characteristics**

Model	SBFM 76/110/DS	SBFM-78 330/DS/KEY/50Hz	SBFM-78 2700/DS/KEY/50Hz
Memory Type	Volatile	Permanent	Permanent
Images on primary Display		1	
Images on secondary Display	110 Volatile	330	2700
A/D Converter	8 bit	10 bit	10 bit
D/A Converter		8 bit	
Sampling Rate		15 MHz	
Video Input	Standard CCIR 1 Vpp Composite Video Signal 75 Ohm termination		
Video Output	Standard CCIR 1 Vpp Composite Video Signal 75 Ohm termination	Standard CCIR 1 Vpp Composite Video Signal 75 Ohm termination 2 out 625 line 100Hz 1 Vpp 2 out 625 line 100Hz 1 Vpp	
Processing	Recursive Filter OFF/2/4/8/16 frame integration Real Time Digital Rotation Left-Right Inversion Edge Enhancement	Recursive Filter OFF/2/4/8/16 frame integration Real Time Digital Rotation Left-Right Inversion Edge Enhancement Gray Scale Inversion	
Functionality	N/A	Editing Data Patient Automatic data/time registration	

**Neoo R9**

**RTP NW Characteristics**

**Model**

**RTP-NW**

**Hardware Type**

**PC Case**

**Acquisition**

- Fluoroscopy 25 images per second 1024x 1024 x 12 bit
- Recursive filter and movement detection
- Pulsed Fluoroscopy
- Acquisition rate 1,3,6,12, 25 image/sec
- Electronic rotation with 1° step
- Horizontal and vertical inversion
- Brightness and contrast
- Grey scale inversion
- Maximum opacity fluoroscopy acquisition
- Real time subtraction with auto/manual mask
- Storage on disk up to 25 images per second
- Virtual collimators

**Post Processing**

- Electronic rotation with 1° step
- Horizontal and vertical inversion
- Grey scale inversion
- Spatial filters (edge enhancement)
- Cineloop
- Electronic collimators
- Shifting pixels
- Electronic Zoom
- Image subtraction
- Landmarking
- Overview 4-9-16 images
- Print on Windows USB2 printers
- Storage examination on removable drive (USB2 Pen drive) in BMP

**Measures**

- Distance Calculator
- Angles
- Stenosis
- Overwrite text



**Neoo R9**
**Operational Features**
**User Interface**

Display touch screen (also working with work gloves) backlit and high contrast for the insertion of all parameters and for the display of any error messages or system issues.

**Radiography**

2 Points technique (kV – mAs)

**Fluoroscopy**

- “Automatic” Technique (0 Points) with automatic control on kV and mA
- “Manual” Technique (1 Point) with manual control on kV and mA

**Radiography Command**

Double click manual with extensible spiral cable

**Fluoroscopy Command**

Pedal footswitch

**I.I. Field Selection**

Electronic zoom selection according to the number of fields of the Image Intensifier

**Safety**

- Filament current
- mA min and mA max
- Max Exposure Time
- Max Temperature of the monobloc
- Counting monoblock thermal units
- Timer with RX stop every 5 minutes (up to 99 minutes)
- max kV, min kV, max kV, max I
- Anode Rotation
- Microprocessor auto test

**Neoo R9**
**Accessories**
**Thermal Printer**

Sony A6 UP898HD

Sony A4 UP991 AD

**Dosimeter**

Kermax 120-122

**Laser Localizer**

Diode Laser Class II 630-680 nm <1mW Cross Sign

**Sterile Draps**

Drap for Arm, Image Intensifier, Monobloc, Sled

**Neoo R9****Optimal Operating Conditions****Transport and Storage Conditions**

<b>Max Temperature</b>	-10°C ÷ +55° C
<b>Recommended Temperature</b>	0°C ÷ +40° C
<b>Relative humidity</b>	20% ÷ 90%
<b>Atmospheric pressure</b>	500 hPa ÷ 1060 hPa

**Operating conditions**

<b>Max Temperature</b>	+10°C ÷ +40° C
<b>Relative humidity</b>	30% ÷ 70%
<b>Atmospheric pressure</b>	700 hPa ÷ 1060 hPa

## Mechanical characteristics

### Neoo R9

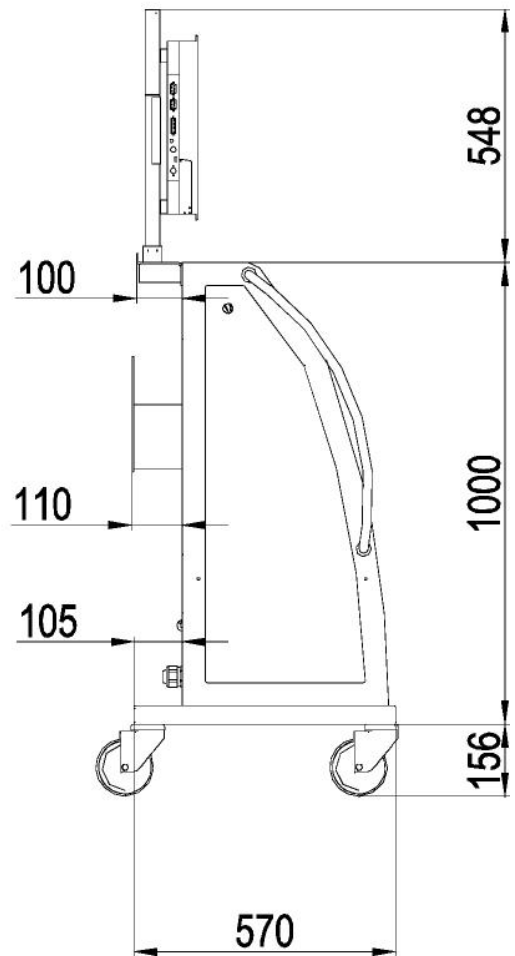
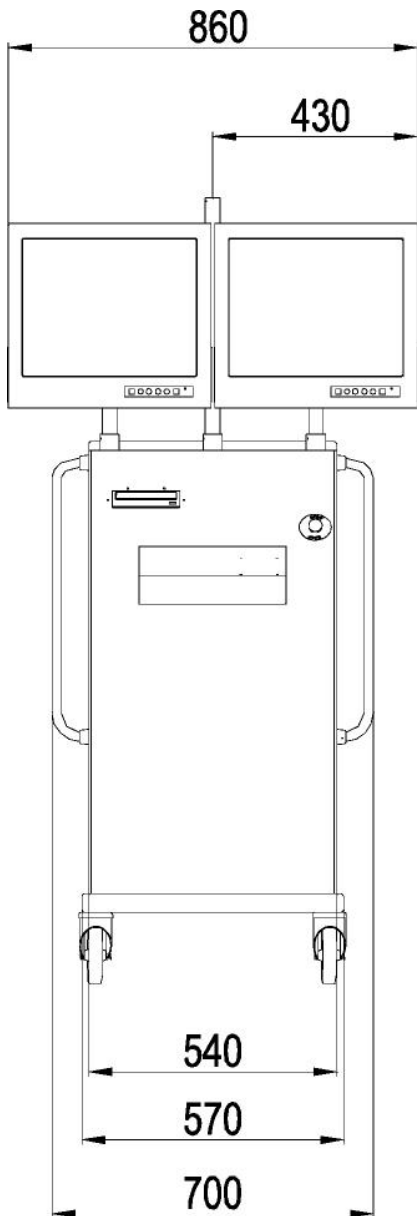
#### Mechanical characteristics

<b>Vertical Movement (Motorized)</b>	450 mm
<b>Horizontal Movement</b>	210 mm
<b>Wig – Wag</b>	± 12°
<b>Lateral Rotation</b>	± 270°
<b>Orbital movement</b>	130° (90°+ 40°)
<b>S.I.D.</b>	1010 mm
<b>Depth</b>	659 mm
<b>Free Space</b>	740 mm
<b>Movement</b>	Manual with steering rear wheels and parking position. Rotating front wheel.
<b>Lenght Min/Max</b>	2018 ÷ 2463 mm
<b>Max Width</b>	830 mm
<b>Height Min/Max</b>	1827 ÷ 2277 mm
<b>Weight *</b>	275 Kg

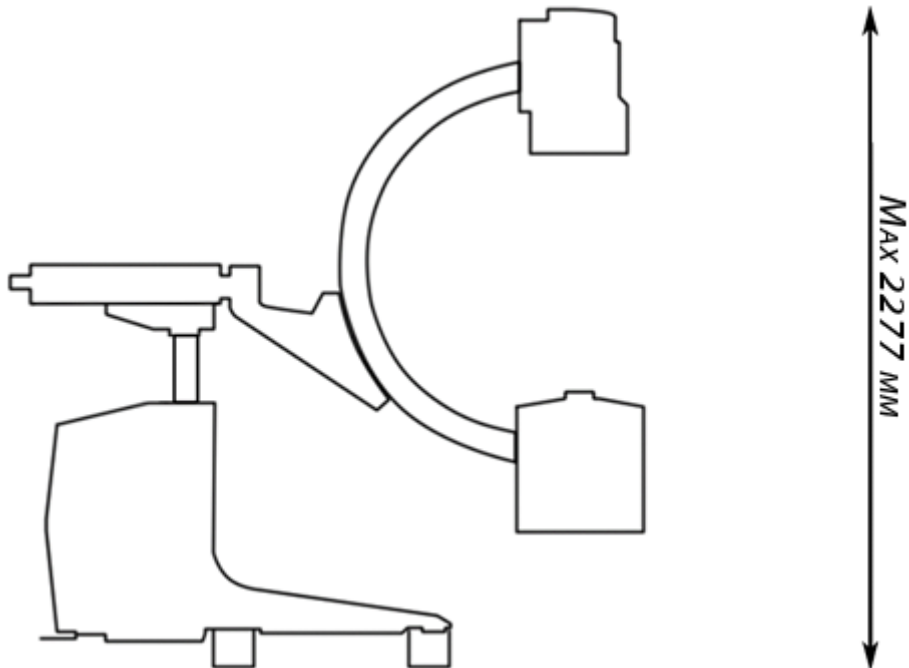
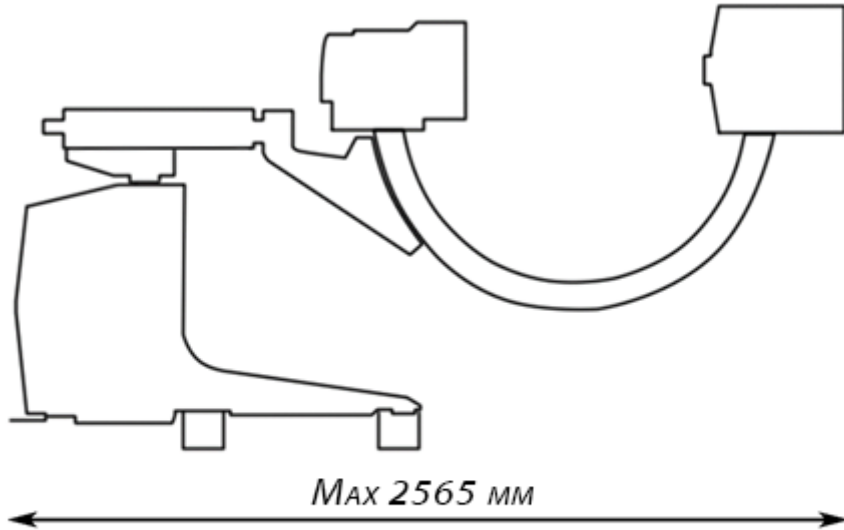
\* Weight referred to Neoo R9 with RTP, Monitor Tecnint, I.I. Toshiba; excluded any other accessories.

*For further details refer to the drawings below.*

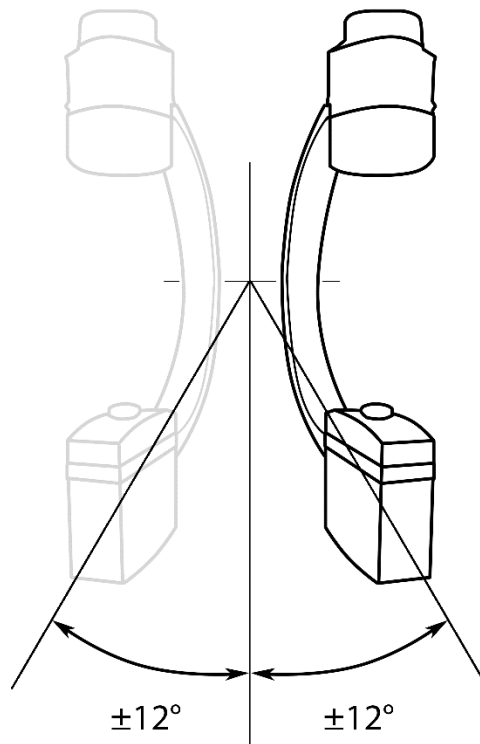
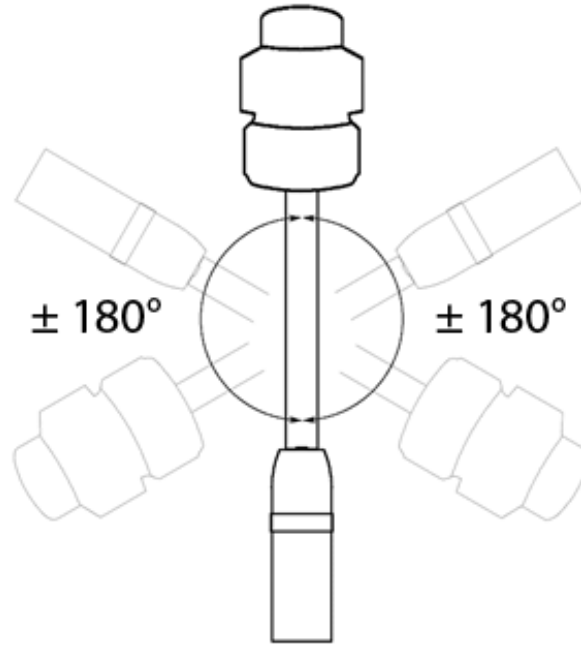
Dimensions of Monitor Stand



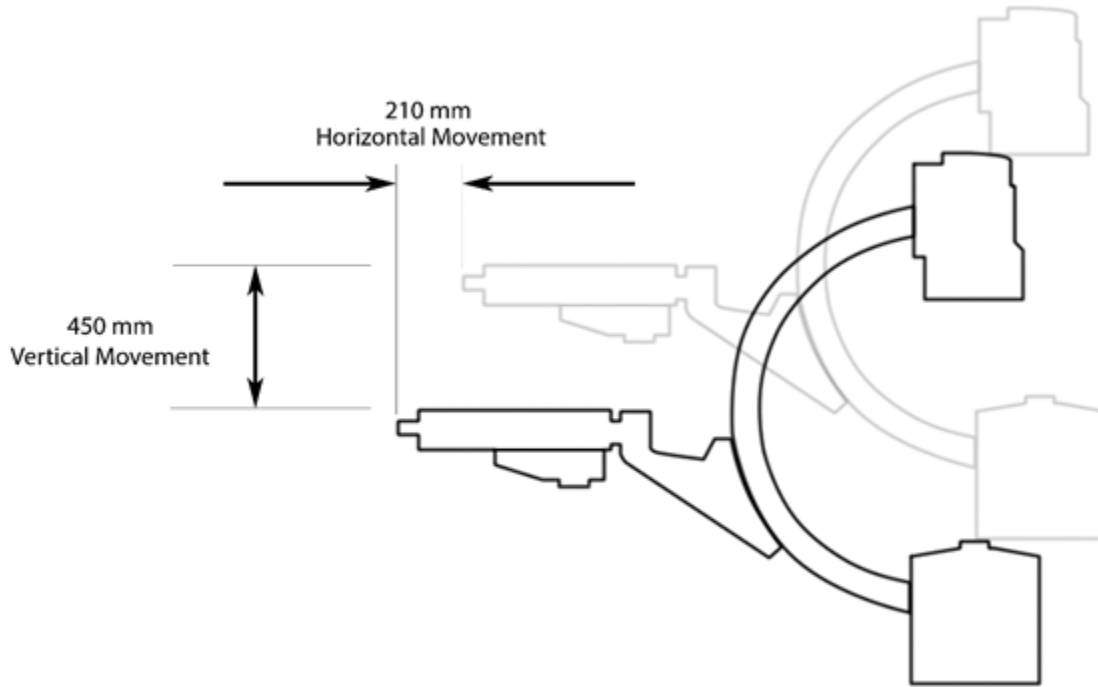
Dimensions of the C-Arm structure



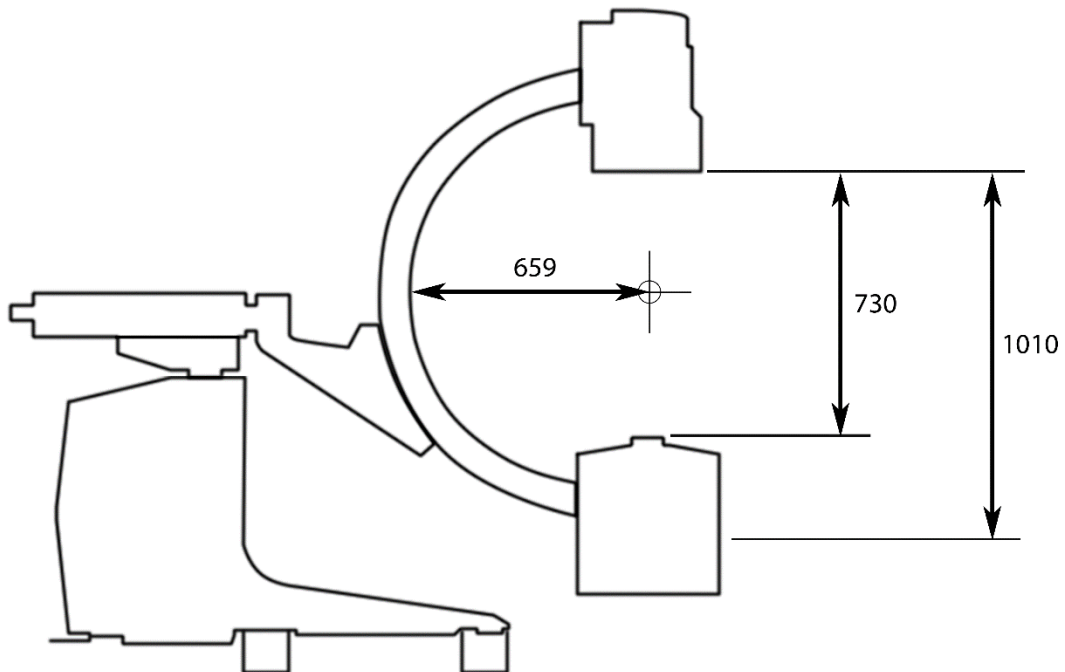
## Arm Movements



### Vertical and horizontal excursions

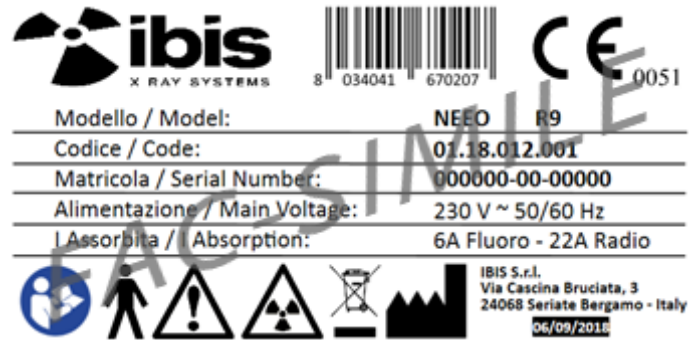


### SID, Free Space and depth

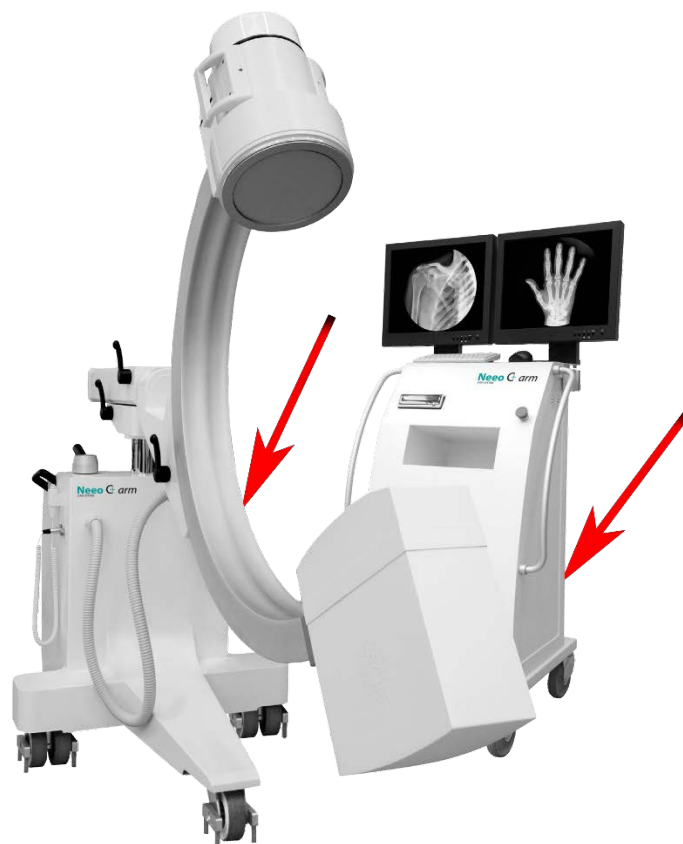


## Labelling

Fac- Simile of the label used for the **Neoo R9** and its usual positioning.



The positioning of the label is shown below. Further identification label is applied inside the equipment next to the inverter label.





## Reference Symbols



CONSULT THE ANNEXED DOCUMENTATION

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CLASS B EQUIPMENT (NORM EN60601-1)

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ATTENTION

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SYMBOL OF DANGER IONIZING RADIATIONS - PHYSIOLOGICAL EFFECTS

---



DEVICE THAT REQUIRES A CORRECT DISPOSAL (2012/19 / EC)

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MANUFACTURER

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CE MARKING COMPLYING TO DIRECTIVE 93/42 / EEC AND SUBSEQUENT AMENDMENTS AND INTEGRATIONS

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## Product Certifications

The **Neeo R9** is classified in class II b (annex IX 93/42 / CE) and complies with the requirements of the European directive 93/42 EEC and subsequent amendments (07/47 / EEC).

The product has been developed according to UNI EN ISO 9001: 2008 and UNI EN ISO 13485: 2012.

It complies with the following standards:

CEI EN 60601-1

CEI EN 60601-1-2

CEI EN 60601-1-6



9120.IB11



IT-30485



9124.IB12



## Registration to the Ministry of Health

**Neeo R9** is a Class IIb medical device regularly registered at the Italian Ministry of Health.

The product identification code is as follows:

<b>Medical Device Class:</b>	<b>IIB - Class IIb</b>
<b>Trade name and model:</b>	<b>NEEO R9</b>
<b>Registration ID:</b>	<b>BD/RDM 1497893</b>
<b>Date first publication:</b>	<b>26/11/2016</b>

## Installation and Warranty

**Neoo R9** must only be installed by properly trained IBIS authorized personnel.

Each device produced or sold by IBIS has one year warranty from the date of shipment unless otherwise agreement between IBIS and the Customer.

The contractual guarantee can be extended to the necessary terms.

The warranty conditions are detailed in the General Conditions of Sale in force on the date of purchase of the product.

## Conclusive Notes

All information contained in this document is confidential and its disclosure, even partial, is forbidden without due notice and authorization by IBIS S.r.l ..

IBIS relieves itself from any responsibility for the unlawful or improper use of its products.

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IBIS has no obligation to communicate any changes to this document.

For any information not indicated in this document, please contact IBIS S.r.l. to the references indicated on page 4.