

High Frequency Surgical C Arm with Stationary Anode Tube with 9” Image Intensifier and Computerized Work Station

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Abstract: ADONIS High Frequency 50 kHz , Stationary Anode , 3.5 kW Mobile Surgical C-Arm for Mobile Fluoroscopic Applications incorporating many performance advances that provide a new level of efficiency , system , reliability and simplicity of operations . The system is designed to meet a wide range of functional needs in Urology operations. This paper provides an extensive overview of mobile surgical C-Arm including technical specifications, composition etc.

Keywords —ADONIS; X-ray Machine; Mobile Surgical C-Arm

I. INTRODUCTION

ADONIS Medical Systems Private Limited, have rich experience of Manufacturing of Medical Equipment’s with dynamic and professional work force. It is located in North of INDIA with Its manufacturing Base at Mohali an Industrial Town in Punjab. We’re continually developing new diagnostic imaging technology that saves lives, and helping hospitals meet the growing demand for high-quality, medical services at prices patients can afford. Our new product introductions, growing services offerings & information technology comprise our foundation for the next century. ADONIS provides its customers with true latest technology yet so Cost Effective. ADONIS has manufactured First Auto programmable and completely Electronic Model in the country keeping in mind the worldwide standard and features with safety and reliability. ADONIS is an ISO 9001:2000 & ISO 13485: 2003 certified Company and also certified by Bureau of Indian Standards (BIS) for Mechanical and Electrical Safety

All ADONIS X-Ray Machines are approved by Atomic Energy Regulatory Board (AERB) for Radiation Safety. Our company deals with the

manufacturing of X-rays machines and we distribute it within the whole world.

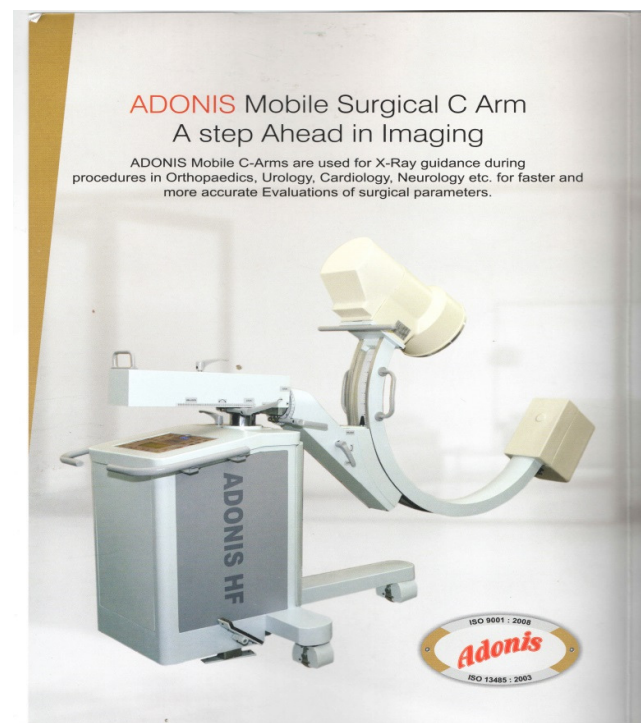


Figure 1: Real time Image of ADONIS Mobile Surgical C Arm

The machines manufactured by ADONIS are listed below:

- Portable X-Ray Machines
- Low powered X-Ray Machines Line Frequency (60, 100mA Mobile and Fixed)
- Low powered X-Ray Machines High Frequency (2.5KW, 3.5KW, 5KW, 6KW,10KW)
- High Powered X –Ray Machines Line Frequency (300 mA , 500 mA, 800mA)
- High Powered X –Ray Machines High Frequency (15KW, 30KW, 50KW, 64KW)
- Mobile Surgical C-Arms Line frequency
- Mobile Surgical C-Arms High Frequency (Stationary Anode and Rotating Anode)
- OPG (Ortho pantomogram)

This paper provides an extensive overview of High Frequency Surgical C Arm with Stationary Anode with 9” Image Intensifier and Computerized Work Station including composition, technical specifications etc. discussed in the upcoming sections.

II. COMPOSITION

The composition of the Surgical Arm is explained as:

- ½” Inbuilt High resolution CCD Camera with High Signal to noise ratio. High Resolution Optical Path.
- 9” Image Intensifier Tube with Triple Field with High DQE and Phosphor screen at the Input.
- High Frequency Monoblock 40 kHz X-Ray Generator for Radiography & Fluoroscopy
- Stationary Anode X-Ray Tube Head : 0.6 mm x 0.6 mm for fluoroscopic operations and 1.5 mm x 1.5 mm for Radiographic operations
- Mechanical C-Arm and 10” x 12” Cassette Holder
- 2 kVA Voltage Stabilizer.
- 17” High Resolution Monitors

- Beautiful Trolley with workstation for processing , Image Storage & Patient Data
- Auto Cleavable covers for Tube Head, Image Intensifier and “C”

A. Additional Features of Control Panel

- Digital Display for mAs, kVp,Technic, X-Ray ON & Overload Protection.
- Independent kVp, mA, mAs Techniques for better radiographic and fluoroscopic results.
- Microprocessor based system for accurate time selection for exposure.
- Automatic Overload protection with visual & audible indication for longer life of the Tube
- Automatic Brightness Control.
- Single step kVp selection. Single step mAs selection.
- Illuminated Front Panel for easy selection even in dim lit rooms.
- Soft Touch keys for mAs selection, mA selection, Radiography/ Fluoroscopy selection & exposure.
- Temperature controlled Tube Protection for longer life of the Tube with Digital Display of Temperature.
- Software Controlled Collimation without Radiation (Off Line)

B. Additional Mechanical Features

- Silent Actuator based Vertical Movement for exact positioning of the object.
- Soft and Trouble Free Horizontal Movement with Imported Sliders.
- Floor brake system
- Sleek and Sturdy Design, light in weight to accommodate less space in OT.
- Inverted “C” with smooth movements.
- Cable Guard on all Wheels to avoid obstacle in mobility.
- Detachable Cassette holder for 8” x 10” and 10” x 12” Cassette for Radiography.

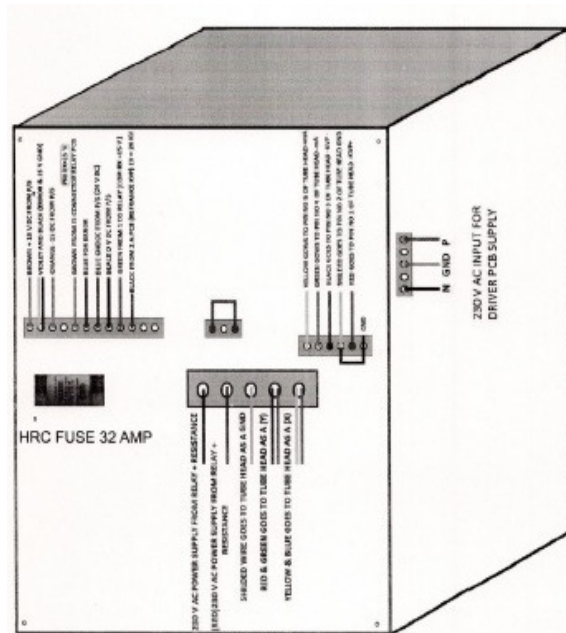


Figure 2: Schematic diagram of Inverter H/F C-Arm

C. Unique Memory Functions

IMAGE MEMORY: Computer Based Processing and Memory System with option to hold Last Image with following image processing functions available in computerized workstation. Pulsed Mode, Live Mode, Recursive Filter, Contrast Enhancement, Negative Image, Zoom both in Horizontal & Vertical Direction, Mirror Images, Upside Down Image etc. Large Data Image Storage Facility both in Frame by Frame mode and in Movie mode. Added DVD writer for recording on the CD/DVD, USB device to take data on PEN Drive.

In built Computer Attachment Facility: PC as a standard feature for storing large data of information both in picture to Picture basis or in movie mode. Added software package for maintain customer records and possible print out on customer printer on paper through customer’s computer. Memory Functions are operable through Cordless Remote without disturbing the Control Panel.

It is dedicated with Individual Software Settings for different Surgeries. It also provides complete Patient data base with complete details of surgery. The capacity of the equipment storage: 50 Temporary Images and more than 10,000 images in permanent mode.

III. TECHNICAL SPECIFICATIONS

The technical specifications of the C-Arm X-ray generator are explained through the table 1.

Table 1. Technical Specifications

<i>Parameters</i>	<i>Specifications</i>
Power Requirement	230 V AC Single Phase, 50 kHz, 15 Amp.
Generator Type	40 KHz Stationary Anode Monoblock X-Ray Generator
kVp Range	50 –110 kVp (Single Step) (Both for Radiography & Fluoroscopy)
Fluoroscopic mA	0.5 mA to 3.0 mA
Radiographic Rating	50 mA at 80 kV
mAs	0 – 220 mAs
Fluoroscopic Timer	Temperature controlled (With audible Alarm)
Radiographic Timer	Automatic Selection by Microprocessor(Using Combination of mAs & mA)
Tube Type	Double focus Stationary Anode Tube Fluoro: 0.6 mm x 0.6 mm (For Fluoro) Radio: 1.5 mm x 1.5 mm (For Radiography) With Beam Hardening Filters.

The Table 2 and 3 explained the features of imaging system and tube support specifications respectively.

Table 2. Imaging system features

<i>Parameters</i>	<i>Specifications</i>
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IITV	9” (225 mm) Image Intensifier Triple Field with Housing and Microprocessor controlled Power Supply
CCD Camera	½” Inbuilt High Resolution CCD Camera with High Resolution Optical Path.
T.V. Monitor	17” High Resolution Colour Monitor with Beautiful Trolley.
IMAGE MEMORY	Computerized Workstation

Table 3. Tube support Specifications

<i>Parameters</i>	<i>Specifications</i>
Focus Screen Test	900 mm
Clearance	800 mm
Vertical Travel	400 mm (Actuator Based)
C-Arm Rotation	+ / - 180 Degrees
C-arm swinging	+ / - 12.5 Degrees
Horizontal Movement	200 mm
C-arm Sliding Rotation	120 Degrees (+90/-30)

IV. CONCLUSIONS

This paper provides an extensive overview of mobile surgical C-Arm including technical specifications, composition etc. the mobile surgical C-Arm is used for X-ray guidance during procedures in orthopaedics, Urology, Cardiology, Neurology etc. for faster and more accurate evaluations of surgical parameters,

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