A very high resolution interline progressive scanning CCD sensor 1024x1024 pixels, with such a considerable dynamic range and an high performance dynamic recursive filter are the key characteristics offered by the N331 camera. This system provides an output signal whose signal-noise rate obtained more than 67dB.

This new camera uses a progressive scan CCD sensor with a resolution of 1024x1024 square pixels (1048K pixels). With an aspect ratio 4:3, this camera uses all pixels at a progressive scan speed of 25/30 full frames/sec. Compared with the standard interlaced CCD camera (CCIR 752x582) rectangular scan which uses the square scan 575x575 (324K pixels) only, the new camera provides three times more pixels than the ones which are actually available.

The progressive scan is flicker free and, therefore, it offers both a better performance during subject movement and pulsed fluoroscopy when it is compared to an interlaced scan.

A very important new feature is the DRF (Dynamic Recursive Filter) which allows pixel by pixel shifting of the recursive filter factor. This type of filter offers better photonic noise reduction, eliminating image persistence found during patient movement.

A small size of dimension and a particular resistance make the camera useful in such applications as mobile C-arm. The sensor unity gamma gives a very good improvement in image contrast. As a result of the very high dynamic range of the sensor, this camera excels in applications of non destructive control test (NDT), where a high difference in brightness from one point to another one in the same image can be found.
## Camera Head
- Square pixels gives uniform resolution in vertical and horizontal direction
- High resolution Charge Coupled Device sensor (CCD)
- Video preamplifier
- Pulses and sync generator
- Power supply circuitry to CCD
- Image rotation system 360° (optional)
- Standard lens system
- Focus & iris adjustments
- Frame mounting for image intensifier
- Remote controlled Neutral Density Filter (optional)
- Zoom lens (optional)

## Control Unit (CCU)
- Main power supply: 20-30V dc input
- Video processing and output amplifier
- Analog and digital output automatic kV or mA control circuit
- 12 Bit analog to digital converter
- 10 Bit (1024 gray levels) video output resolution
- 2 kinds of ROI with square shape
- Digital recursive filter for noise reduction, with DRF (Dynamic recursive filter)
- Horizontal and vertical image inversion
- Dynamic Shading compensation
- Option: up to 64 frames storage memory
- Option: down scan video output 625/50Hz
- Option: Pulsed fluoro logic

- Integrated optical system for direct mounting on the output screen of the image intensifier.
- Standard interface mounting does not require any external additional optics.
- LAST IMAGE HOLD is available with both video outputs.

### OPTIONS
The new memory storage allows up to 64 frames memory in cine-loop mode or 32 selectable individual frames in memory with binary direct access.
End-User can choose among various acquisition frame rates (max 25 frames/sec) and decide by using modalities as follows:
- continuous cine loop and/or
- controlled single image visualization
- All frame are displayed with their corresponding number of sequence during acquisition mode.
- Simple functionality is guaranteed by a new easy-using interface based on displayed icons at the border of the screen indicating running operations.
- Cine-loop can record and play up to 25 frames/sec or it can run at a reduced frame-rate for a longer time.
- The Down scan option offers one video output of 625/50 sync when using a Video recorder or video printer.

## Technical Data

<table>
<thead>
<tr>
<th>Available CCD scanning system</th>
<th>1024x1024 pixels – Progressive scanning</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCD Camera Head</td>
<td>High resolution with adjustable focus and diaphragms From 15 to 40mm diameter From 6&quot; inches to 16&quot; inches I.I.</td>
</tr>
<tr>
<td>CCD /CCU Characteristics</td>
<td>0.35 (for best performances) 12 Bits 10 Bits 40 MHz ± 3dB Yes 16 Bits Yes. Analog and digital (up/down) Yes (shading) Yes 1 Vpp (0.3 Vpp Sync) Internal logic for pulsed fluoroscopy from 1 to 25 fr/sec</td>
</tr>
<tr>
<td>Video output standards</td>
<td>two channels 1049/60 Hz (aspect ratio 4:3) 1 channels for Video printer or VCR (option)</td>
</tr>
<tr>
<td>Operating conditions</td>
<td>Working temperature range: -10°C to +45°C Store temperature range: -35°C to +65°C Humidity: Operating to 95% relative humidity (non-condensing)</td>
</tr>
</tbody>
</table>
**N33 Series**

**Altitude:**
- Non-operating: 50,000ft (15,000mt)
- Operating: 15,000ft (4,500mt)

**Mechanical Specifications**
- **Control unit:**
  - Dimension (WxDxH)/Weight: 235x192x65mm 1500gr
- **CCD head standard:**
  - Dimension (Max diameter/H)/Weight: 127x108mm 1400gr
- **Camera head with rotation:**
  - Dimension (Max diameter/H)/Weight: 125x95mm 1400gr

**Available Power Supply:** 24Vdc ±15%

**Approvals**
- Safety: EN 60601-1
- EMC: EN 60601-1-2
- Others: CE-label according 93/42 CEE directive for medical devices.

**Options**
- 360° Continuous rotating camera head (with slip ring)
- C-Mount lens
- Down scan video output 625/50Hz
- Up to 64 frames storage memory
- Zoom lens
- Neutral density filter: 25% or 50% light transmission

### How to Order

```
N 33 1 N 0 Y Y A
```

- **N** = Normal
- **R** = Rotation
- **0** = No ND filter
- **1** = ND filter dimming 50%
- **2** = ND filter dimming 75%
- **1** = 32 Frames with binary direct access or 64 frames in cineloop mode
- **A** = No Frames
- **YY** = 2 Video outputs 1049/60
- **ZZ** = 2 Video outputs 1049/60 and 1 video output 625/50
- **CL** = 1 video output for camera link

### Approvals
- **EN 60601-1** Safety
- **EN 60601-1-2** EMC
Note: We reserve the right to make any modifications.