

## **BIR 150/130** Desktop micro CT/DR/RTR X-ray imaging system with helical scan mode

The BIR 150/130 is a desktop Volume Computed Tomography (VCT) system suitable for X-ray inspection of small organic, metallic and non-metallic items. CT provides superior flaw detection capability of extremely small cracks, voids and porosity that are not visible with film radiography or RTR inspection.

A manipulator positions the object for CT data collection. Turntable rotation axis is vertical to produce a horizontal slice orientation. Z-axis mechanics move the part vertically to select the desired region of the part for Volume CT acquisition. During helical scanning, the Z-axis moves the part vertically while simultaneously rotating the part, allowing for 50% faster scan time than traditional step-and-shoot techniques. The Y-axis moves the turntable between source and detector for magnification.

### Key system components

- > 130 kV sealed-tube microfocus X-ray system (Optional 90 kV tube available)
- > 100/50 mm dual-field image intensifier
- > Solid-state CCD camera
- > Four-axis manipulator: two motorized (rotation/vertical), and two manual (magnification/offset)
- > Windows XP®-based ACTIS 5.0 system architecture for volume micro-CT data collection, image reconstruction and image viewing
- > Cabling, power supplies and motion control hardware
- > Built-in shielding meets 21 CFR 1020.40 X-ray safety requirements



The system provides circular Feldkamp VCT, as well as helical Feldkamp VCT. In circular VCT mode, cone beam data for 100 contiguous slices are acquired during 360° rotation of the part. Image reconstruction time is equivalent to single-slice specifications multiplied by the number of slices in the volume. In helical Feldkamp mode, the part translates vertically while simultaneously rotating, allowing single pass volume data acquisition of parts that extend beyond the cone angle of the X-ray beam.

Hardware options include a laser image printer, which produces 128 levels of gray scale information.

## Specifications

### 1.0 Microfocus X-Ray System

- 1.1 Voltage range: 20-130 kV  $\pm$  0.5%
- 1.2 Maximum power: 16 watts, 45-130 kV
- 1.3 Beam current range: 0 mA  $\pm$  to 0.356 mA
- 1.4 Spot size vs. power
  - 7 microns or less @ 4 watts
  - 9 microns or less @ 8 watts
  - 21 microns or less @ 16 watts

### 2.0 Dual-Field Image Intensifier

- 2.1 Input diameter
  - 98 mm nominal in 4" mode
  - 49 mm nominal in 2" mode
- 2.2 Spatial resolution
  - 7.5 lp/mm in 4" mode
  - 11.0 lp/mm in 2" mode

### 3.0 Digital Video Camera

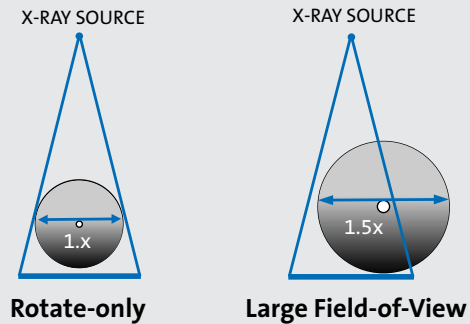
- 3.1 Type Vosskuehler GmbH CCD-1020 solid state high dynamic range camera
- 3.2 Signal format: 1024 x 1024, RS-422, 12-bit digital
- 3.3 Frame rate: 15 FPS at full resolution
- 3.4 Dynamic range: 70 dB

### 4.0 Object Size and Weight

- 4.1 Maximum diameter: 150 mm
- 4.2 Maximum height: 150 mm
- 4.3 Maximum weight: 5 kg
- 4.4 Maximum vertical travel: 150 mm

### Large Field-of-View

- Up to 150% larger scan field than rotate only
- Fast scan times
- Standard feature



### 5.0 Manipulator Parameters

Vertical rotation axis, horizontal slice orientation (operator-controlled for fluoroscopy imaging, computer controlled for CT imaging), manual axes for magnification and centering, 75 mm diameter turntable and four tapped holes M4 on 68 mm  $\varnothing$  for fixture mounting

- 5.1 Vertical travel (z-axis): 150 mm
- 5.2 Turntable: Continuous rotate in either direction
- 5.3 Absolute accuracy: 5  $\mu$ m
- 5.4 Repeatability: 5  $\mu$ m
- 5.5 Maximum vertical speed: 2 mm/sec.
- 5.6 Maximum rotation speed: 24 $^\circ$ /sec.

### 6.0 Accessories

Alignment grids, test phantoms

## 7.0 Computer System

Intel® Dual Xeon™ 3.2 GHz CPU, 4 GB SDRAM main memory, two 300.0 GB hard disk drives (in removable canister), 2-port serial PCI card, 16x DVD+/- RW drive, 1.4 MB 3.5" floppy disk drive, camera interface board, monitor PCI card w/32MB DDR, 20.3" LCD color display (1600 x 1200), Ethernet interface, keyboard, and wheel mouse



## 8.0 Image Processing Software

ACTIS 5.0 on Windows XP®

## 9.0 System Mains Power Requirements

Input voltage, 90 to 140 VAC or 170 to 240 VAC; frequency, 48 to 62 Hz; maximum power, 1500 watts

## 10.0 Environment Limits

Operating temperature, 10°C to 35°C; storage temperature, -40°C to 47°C; relative humidity, 5% to 95% (non-condensing); altitude, 0 to 3,000 meters

## 11.0 Options

Gray scale image printer  
90 kV X-ray source

## 12.0 System Weight

195 kg (430 lbs.) ± 5%

## 13.0 System Dimensions

13.1 Closed:

Length: 1524 mm (60")

Depth: 521 mm (20.5")

Height: 762 mm (30")

13.2 Open:

Length: 1824 mm (72.5")

Depth: 521 mm (20.5")

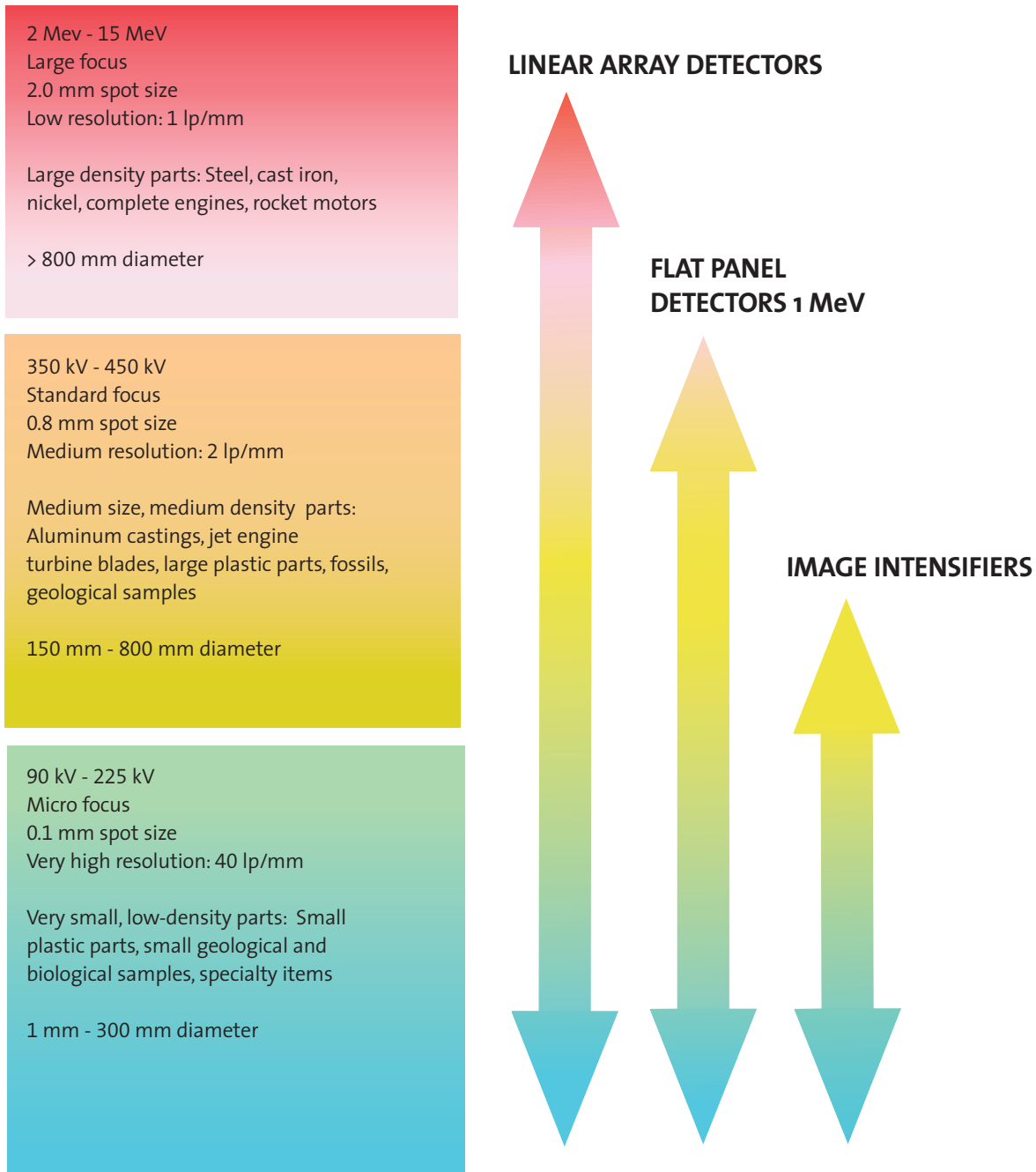
Height: 762 mm (30")

*Specifications subject to change without notice.*

*Note: Any technical data contained in this document may vary within defined tolerances. Original images always lose a certain amount of detail when reproduced.*

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## Typical X-ray Energies and Detector Types



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