BN-XRD-Y3000

X-Ray Diffraction Instrument



Product Overview

The BN-XRD-Y3000 is designed for X-ray diffraction analysis of internal material structure. The source brochure describes determination of crystal structure, lattice constants, complete qualitative and quantitative analysis, with accessories supporting macroscopic stress, micro-stress, crystal size and degree of crystallinity determination.

Integrated measurement platform

The system combines a high-stability X-ray generator, horizontal goniometer, detector, recording/control unit, circulating-water cooling and application software for diffraction workflows.

Why BN-XRD-Y3000

01

MORE ACCURATE

High-precision goniometer system and highly stable X-ray generator control.

02

MORE CONVENIENT

Programmed operation, integrated structure design and simple operation.

03

MORE STABLE

Imported PLC control technology, high automation, low failure rate and long using life.

Technic

Precision X-ray ge

High pressure generator （Adopting imported PLC control technology）

Rated Power: 3kW.
Tube Voltage: 10~60kV It is automatically controlled by computer terminal(1kV/step).
Tube Current: 5~80mA It is automatically controlled by computer termina(1mA/step).
Tube Voltage and Current Stability≤0.01%.
Protection of over voltage, over current, over power, and low water level.
X-Ray Tube: Cu target, Focal point 1×10mm2, Power 2.0kW.
Optical shutter switch is automatically controlled by computer terminal;
Unibody structure cooling device, Cooling device is unibody structure,
and the automatic temperature control system can indicate the water
temperature of X-ray tube.

Goniometer and Control (Horizontal type)

Horizontal Type θ—2θ, diffraction circle radius 185mm; Rotation of goniometer is controlled by stepping motor (forward or reverse, forward scan), drive mode (move individually or jointly), scanning mode(continuous, stepping), scanning speed, it can do angle-auto correction, detect losing step and avoid lost motion;
Minimum Step Angle: 0.001°
Continues Scan Speed: 0.0012°—70°/min
Step scanning step width angle: 0.005~165°
2θAngle measurement range: ≤0.005°;
2θAngle measurement range: 0--164°
Goniometer 2θangle uni-directional Repeatability 0.001°

Recording and Controlling Unit and Detector

Closed scintillation counter
Auto differential and integral conversion
Base line and channel width: 0%~99%
Continuous adjustable high voltage of detector : 0~2000V
High voltage stability of detector: ≤0.01%
Optional X-ray tube target material: Cr、Fe、Co、Cu、Mo
Energy Spectrum Analysis (Cu, Kα Curve): ≤25% (PC) , ≤50% (SC)

Key Technical Values

Rated power 3 kW	**Tube voltage** 40–60 kV	**Tube current** 5–80 mA
Minimum step angle 0.001°	**Continuous scan** 0.012°–70°/min	**2θ range** 0–164°
Detector HV 0–2000 V	**Detector HV stability** ≤0.01%	**Overall stability** ≤0.3%

Protection includes overvoltage, overcurrent, overpower and low-water protection. The X-ray tube uses a Cu target; optional target materials include Cr, Fe, Co, Cu and Mo.

Horizontal θ–2θ geometry • 185 mm diffraction circle radius • Uni-directional repeatability 0.001°

Software & D

Integrated control, acquisitio

Overall Stability

System overall stability ≤0.3%;

Outline Dimension

XRD host net Dimension: 1100×950×1750mm

On-line control software

The on-line control software can order the XRD system to do continuous scanning or stepscanning and data acquisition. The software can process the general diffraction data and manage the disk file. Data processing including peak seeking (automatic and manual), single peak integral intensity calculation, smoothing, peak shape amplification, multiple drawing, etc .

Application software (English Interface)

▲ **Operation functions:**
Diffraction peak measurement, overlap scanning, net intensity measurement, timer counter, goniometer rotating, goniometer step forward and back, goniometer adjustment, 2θcalibration, tube current and tube voltage optical shutter controlling.

▲ **Data analysis and processing function:**
Smoothing, background deduction, Kα2 Peeling, peak seeking(mark D value,θvalue, d,2θintensity, half-peak bandwidth, display all parameters and many representing methods of diffraction peak), changing sampling step, eliminating , eliminating miscellaneous peak and interfering peak, d data and peak position correction.

▲ Calculate integral area, integral breadth, half-peak bandwidth; Spectral graph comparison, map add and subtract, and map combination; Insert text at any location in the map; Two kinds of cursors (small vernier, large cursor);Multiple zoom function; Multiple coordinate modes
(linear coordinates, logarithmic coordinates, square coordinates).

▲ **Peak amplification:** user can make any multiple of any multiple of the map by the left and right keys of the mouse.

▲ **Qualitative analysis:**
Automatic retrieval and manual retrieval can be performed. Automatic retrieval results include: card number, molecular formula, matching index, reliability factor, and K value. Semi-quantitative analysis and k-value analysis can be carried out.

▲ **Quantitative analysis:**
The absorption coefficient of the two components is different with the standard addition method, internal standard method and N component absorption coefficient.

▲ **The crystallinity of the sub-peak method is calculated**
The partial peak process can directly change the parameters of the sub-peak by the mouse, and the difference between the fitting spectrum and the measured spectrum can be seen intuitively.

▲ **It can do refinement of cell parameters.**

▲ **Index.**

▲ **Diffraction data calibration:**
Using standard diffraction data CARDS (1-54 groups), the original data of the measurement was deviated to correct and the instrument measurement error was eliminated.

Core Application Functions

- Diffraction peak measurement and overlap scanning
- Net intensity measurement, timer/counter and goniometer control
- 2θ calibration and tube current / voltage / optical shutter control
- Smoothing, background deduction, Kα2 peeling and peak seeking

Data handling

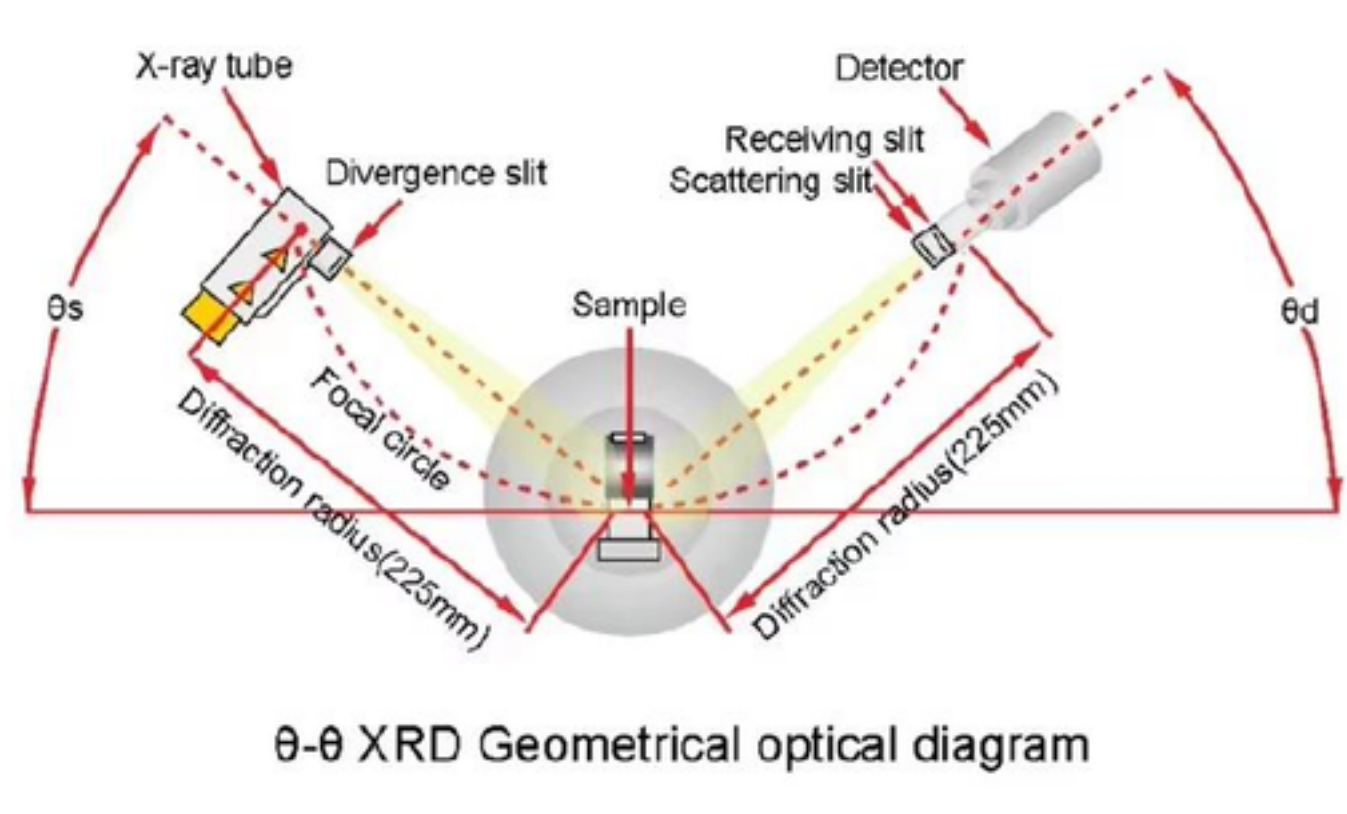
The supplied software supports continuous or step scanning and data acquisition, processing of diffraction data, disk-file management, automatic/manual peak seeking, multiple drawing and coordinate modes. Qualitative analysis can return card number, molecular formula, matching index, reliability factor and K value; quantitative analysis includes standard addition, internal standard and N-component absorption coefficient methods.

System Configuration

Configuration List

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Part	Element	Unit	Qty.
X-Ray High Voltage Generator	1) 150S High Voltage Transformer	set	1
	2) DW-75kV High Voltage Cable	piece	1
	3) 9850 Control panel	set	1
	4) 9820 High voltage control unit	"	1
	5) 9830 Control gate	"	1
	6) 9810 System Case	"	1
	7) 9840 Main power cable	piece	1
	8) X-ray tube 2kW Cu, Focus size 1×10mm²	piece	1
	9) 3306 Tube holder	set	1
	10) 9924 X-ray Protective cover	"	1
Angle Measuring System	1) 3501 Goniometer	set	1
	2) Goniometer layer board	"	1
	3) Powder sample plate with blind Holes	piece	20
	4) Powder sample plate with through holes	"	10
	5) Micronutrient powder sample board	"	10
	6) Zero setting sample piece, double-knife edge slit	piece	1
	7) Standard ruler, watch oil	piece	1
	8) Filter Ni	piece	1
	9) Slit	set	1
Recording and Controlling Unit	1) 2013 Recording and controlling units	set	1
	2) CH132 Scintillation counter	set	1
	3) Counter cable	piece	1
	4) Stepping motor cable	"	2
	5) Inserface cable	"	1
Circulating Water Cooling System	1) DW-ZFB-3000 Cooling device	set	1
	2) 9509 Power cable	piece	1
	3) Water pipe 6 meters	piece	2
	4) Water relay cable	piece	1
Computer	1) INTEL Pentium G2030, RAM 2G ,500G Hard disk 19"LCD	set	1
	2) Canon LBP6018 Laser printer	"	1
System Control Program and Applicable Software	1) Data collecting and processing software	piece	1
	2) Data analysis and processing software	"	1
	3) Application software	"	1
	4) Diffraction data card stock	"	1
Technical Material	1) DW-Y3000 X-ray diffractometer user manual	piece	1
	2) DW-ZFB-3000 Cooling device user manual	"	1
Spare Parts	1) ring rubber blanket	piece	4
	2) Fuse 2A 3A 6A	piece	10

X-ray high-voltage generator • angle measuring system • recording/control • cooling • computer • software • technical material • spare parts



θ-θ XRD Geometrical optical diagram



Key Measurement Components

X-RAY TUBE
Cu target; 2.0 kW tube power

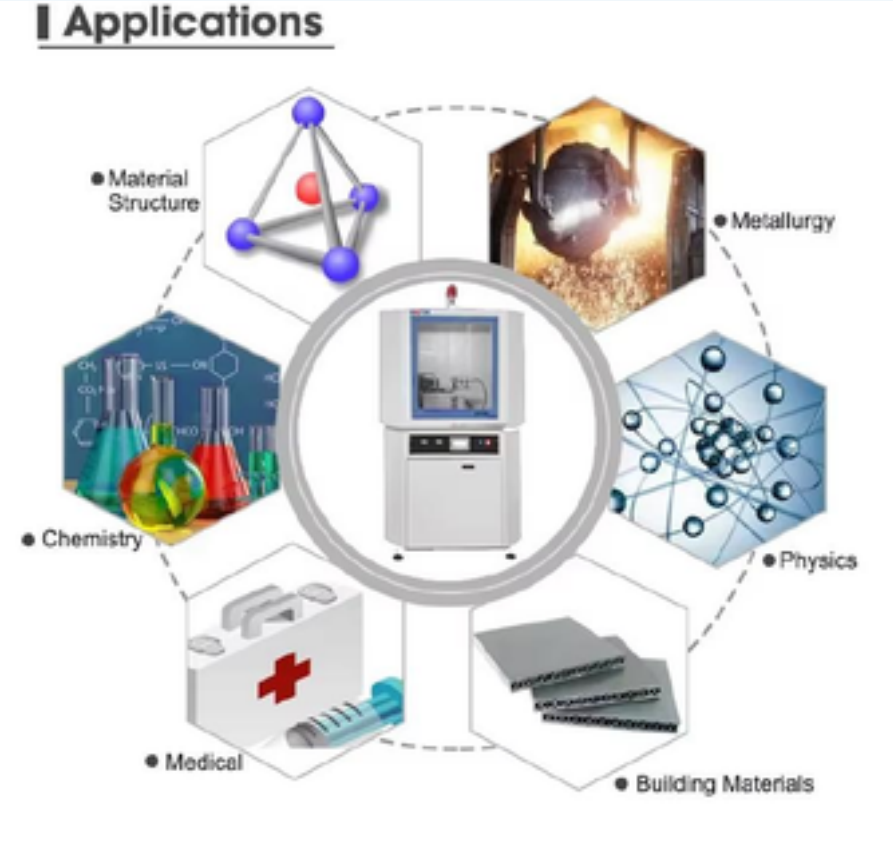
HORIZONTAL GONIOMETER
185 mm diffraction circle radius

SCINTILLATION COUNTER
Closed detector configuration

HD DISPLAY
Instrument control and status display

The geometry diagram and component visuals are retained from the supplied BN-XRD-Y3000 source.

Applications



MATERIAL STRUCTURE

Crystal-structure and lattice-related analysis.

METALLURGY

Diffraction-based characterization.

PHYSICS

Material and structural studies.

BUILDING MATERIALS

Structural material analysis.

MEDICAL

Medical-material studies.

CHEMISTRY

Chemical-material investigations.

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