

FISCHERSCOPE® X-RAY 5000 Series

X-ray fluorescence measuring system for continuous in-line measurement and analysis of thin coatings, i.e. CIGS, CIS, and CdTe, in production processes.



Main features

The instruments of the FISCHERSCOPE X-RAY 5000 series are innovative, energy dispersive x-ray fluorescence measuring systems (EDXRF) for in-line applications in industrial production sites. They fulfill DIN ISO 3497 and ASTM B 568.

These instruments are specially designed for continuous non-destructive analysis and measurement of thin layers and layer systems in production processes. For industrial demands and maintenance free continuous operation, the design is robust and without any moving parts.

The X-RAY 5000 instruments measure and analyze layers and layer systems

- in the photovoltaic industry, i.e. CIGS, CIS, CdTe,
- on glass panels, foils and belts,
- on very hot surfaces (water cooled versions) and
- in continuous operation.

The X-RAY 5000 measures in a vacuum or in the atmosphere. With its powerful semiconductor detectors, it can determine elements in the range of sodium to uranium.

Calibration is carried out quick and easy with a master standard directly in the production process. Due to a large aperture, new semiconductor detectors and a digital pulse processor, the X-RAY 5000 features outstanding repeatability, which reduces the necessity for re-calibration, thereby saving time and effort.

Performance

FISCHERSCOPE X-RAY 5000 units are robust measurement heads and are simple to mount.

For each application the x-ray source as well as the semiconductor detector can be customized for best results.

For easy integration into production lines, the X-RAY 5000 comes with a standardized mounting flange. Various modular build versions are available:

- 5100 for measurements in the atmosphere and on substrates
- 5300 and 5400 for measurements in vacuum, with a special sealing flange, which allows for dismantling the x-ray without releasing the production line vacuum
- 5200 and 5400 with cooling flange for measurements on very hot substrates with surface temperatures of up to 400 °C (752 °F)

The analysis of the gauging and the display of all information is carried out by an evaluation PC with the easy-to-use WinFTM® software. All X-RAY 5000 devices are easily integrated into industrial process control systems via the following interfaces: RS232, Command files, OLE Automation, TCP-IP, PROFIBUS and PROFINET.

Specification

Intended use	Energy dispersive x-ray fluorescence measuring system (EDXRF) to analyze and measure coatings and layer systems continuously in production processes.
Element range	Sodium Na (11) to Uranium U (92) if measured in vacuum Chlorine Cl (17) to Uranium U (92) if measured in the atmosphere
X-ray tube	Tungsten or optional microfocus-tungsten tube Microfocus tube optional with rhodium-, or molybdenum target
High voltage	Three steps: 10 kV, 40 kV, 50 kV
Aperture (Collimator)	Application specific, round, rectangle or slot shape
X-ray detector	Silicon-PIN-detector or silicon-drift-detector (SDD), peltier-cooled
Resolution (fwhm for Mn-K α)	≤ 140 eV with silicon-drift-detector ≤ 180 eV with silicon-PIN-detector
Signal processor	Digital pulse processor
Distance compensation	± 3 mm (118 mils) for measurements on glass substrates, with specific applications up to ± 5 mm (197 mils)

Types

	5100	5200	5300	5400
Measuring environment	Atmosphere		Vacuum	
Build		Water cooled, (e. g. with water temperature 20 °C/68 °F, water pressure 5 – 9 bar, flow rate 6 l/min)		Water cooled (e. g. with water temperature 20 °C/68 °F, water pressure 5 – 9 bar, flow rate 6 l/min)
Sample surface temperature	≤ 40 °C (104 °F)	≤ 400 °C (752 °F)	≤ 40 °C (104 °F), higher with optional reflection foil	≤ 400 °C (752 °F)
Measuring distance	60 – 100 mm (2.4 – 3.9 in), other distances on request			

Electrical data

Power supply	AC 115 V or AC 230 V 50 / 60 Hz
Power consumption	Max. 100 W (without evaluation PC)
Protection class	IP50

Dimensions

	5100	5200	5300	5400
Weight	37 kg (81.6 lb)	47 kg (103.6 lb)	37 kg (81.6 lb)	47 kg (103.6 lb)
Flange dimensions	Standard ISO 250F flange – others on demand			
Outside W x D x H	236 x 350 x 370 mm (9.3 x 13.8 x 14.6 in)			

Environmental conditions

Operating temperature	0 °C – 40 °C (32 °F – 104 °F) around the housing
Storage temperature	0 °C – 50 °C (32 °F – 122 °F)
Admissible air humidity	≤ 95 %, non- condensing

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Evaluation unit

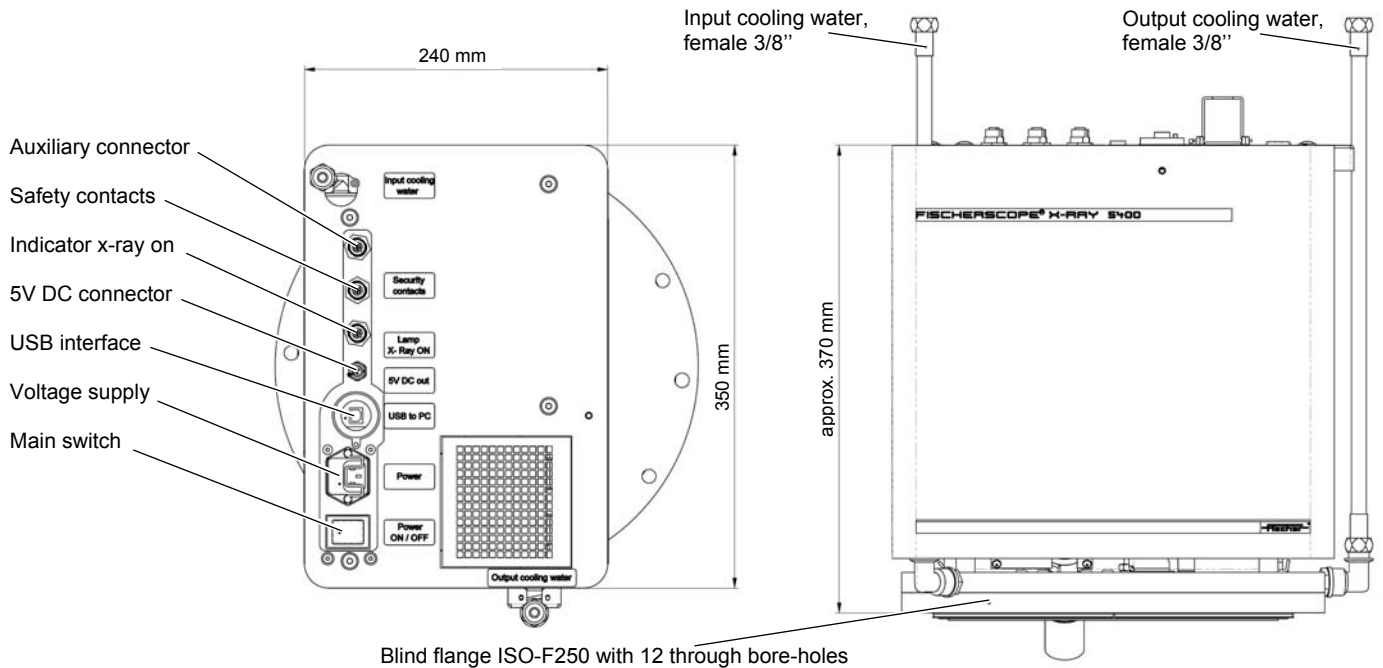
Computer	Windows® PC
Software	Standard: Fischer WinFTM® BASIC including PDM® Optional: Fischer WinFTM® SUPER

Standards

CE approval	EN 61010
X-Ray standards	DIN ISO 3497 and ASTM B 568
Approval	Individual approval. The provisions of local law have to be observed.

Order

FISCHERSCOPE X-RAY 5000	On demand Special X-RAY 5000 product modification and X-RAY 5000 technical consultation on request
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