Datasheet

Fourier Transform Near-Infrared Spectrometer | IR2500

Features

- Unique optical path design;
- High-performance detector ensures stable and accurate results;
- No sample preparation required, sample detection in tens of seconds;
- Large light spot with rotational scanning to overcome sample inhomogeneity issues;
- Integrated design suitable for various application scenarios;
- High-definition touchscreen operation with intuitive and user-friendly experience;
- Long-life light source (over 5,000 hours), easy maintenance;
- Multiple data transmission interfaces for easy data sharing with other devices.

Applications

- Food Grain Industry: Measurement of moisture, protein, fat, and other key parameters in wheat, soybeans, and other grains.
- Flour Processing Industry: Analysis of moisture, protein, fiber, sedimentation value, ash content, and related parameters in flour products.
- Feed Industry: Comprehensive evaluation of finished feed products, including pet food, for nutritional and compositional quality control.

Description

IR2500 is a state-of-the-art Fourier transform near-infrared (FT-NIR) full-spectrum analyzer developed by Optosky, designed specifically for rapid, non-destructive, and precise material analysis across a wide range of industries. Combining advanced optical engineering, robust hardware, and intelligent software integration, this instrument delivers exceptional analytical accuracy, high-speed measurement performance, intuitive operation, and durable construction that ensures reliable functionality even in challenging operational environments. Its versatile design enables efficient detection and quantification of critical parameters—including moisture, protein, fat, ash, starch, fiber, sedimentation value, and other key constituents—in nearly all types of solid-state samples, supporting quality control, process optimization, and research applications in fields such as grain and food processing, agriculture, pharmaceuticals, and material science.

1. Parameter

Specifications	
Instrument Model	IR2500IR
Spectral Range	1000 nm – 2500 nm
Analysis Parameters	
Analysis Time	Less than 60 seconds
Analyzed Products	Rice, paddy rice, rapeseed; can be extended to wheat, barley, soybeans, corn, and other granular grains, as well as powdered samples such as flour.
Analysis Parameters	Rice & Paddy: Amylose, protein, moisture, etc.; can be upgraded upon request to detect taste score, fatty acids, etc. Rapeseed: Moisture, oil content, etc.
Accuracy	Within ±10% (relative error)
Repeatability	CV ≤ 5%
Instrument-to-Instrument Variation	Within 3%
Sample Dish Size	Φ120 mm
Minimum Sample Amount (Rice)	> 100 g
Optical Parameters	
Wavelength Accuracy	< 0.1 nm
Spectral Resolution	3 nm
Light Source Lifetime	≥ 5,000 hours
General Parameters	
Communication Interface	USB, Ethernet
Power Supply	110 V – 240 V, 50/60 Hz
Dimensions	550 × 400 × 250 mm
Operating Conditions	Temperature: 5 °C – 40 °C; Humidity: 30% – 85%
Weight	12 kg
Industrial PC	i5 or higher processor; built-in Windows OS with Chinese operation software; ≥ 10-inch capacitive touchscreen; simple and intuitive user interface.

2. Packing List

Optional Accessories	
1	Sample Dish
2	Measuring Cup
3	Transmission Module (for liquid sample measurement)

3. Working Principle

In the near-infrared spectral region, organic components within a sample absorb near-infrared light due

to the stretching vibrations of hydrogen-containing atomic groups such as N-H, O-H, and C-H, which possess relatively high energy levels. This principle forms the basis for quantitative analysis of corresponding substances.

As illustrated in the figure below, the instrument employs a dual-light-source system. The light emitted from the sources is initially collimated by the lamp reflectors and then directed onto the sample surface at an oblique angle. After diffuse reflection from the sample, the light is collected by a diffuse reflection probe and transmitted via optical fiber into the spectrometer for spectral analysis and computation.