

Compact FT-NIR Spectrometer

ATP9900-FT-NIR

Features:

- **Interferometer 10 year warranty:** Excellent performance and reliability, resistant to vibration and thermo effect, wear-free pivot mechanism and high throughput design guarantee exceptional sensitivity, stability and reliability even in harsh environments.
- **Broad wavelength range:** 12500 - 4000 cm⁻¹(800 - 2500nm)
- **High resolution** of less than 2cm⁻¹
- **High sensitivity** of 2-TE cooled InGaAs
- **Detector:** High Sensitivity InGaAs
- **PCB:** High stability self-designed pcb hardware and software
- **Interface:** SMA905 for external transmission modules, various solid probe or liquid probe

Description :

ATP9900-FT-NIR series compact FT-NIR spectrometer is self-designed seal integrated exclusive CaF₂ NIR beamsplitter and high sensitivity 2 TE cooled InGaAs Detector.

FT-NIR spectroscopy is a non-invasive fast analysis technology used to measure molecule vibration of hydrogen bonding say C-H, N-H, O-H, and it can construct NIR quantitative model for concentration variations, including solid sample of drugs, powder raw materials to direct contact, detect through packing or glass container to measure spectra can save operator time to improve experiment efficiency.

Model	Description
ATP9900-C	Classical FT-NIR spectrometer with fiber optic probes (for solids and liquids).
ATP9900-CL	FT-NIR spectrometer with contact less measurement only
ATP9900-T	FT-NIR spectrometer with transmission probe (for liquids).
ATP9900-R	FT-NIR spectrometer with reflection probe (for liquids)



1. Performance

Items	Parameters
Spectral Resolution	$\leq 2 \text{ cm}^{-1}$
Spectral Range	12500 - 4000 cm^{-1} (800 - 2500nm)
Light Source	High Performance NIR light source
Transmission Precision	$< 0.1\%T$
Detector	High sensitivity InGaAs 2-stage TE-cooled
Laser	Solid laser 10 year warranty
Beamsplitter	Exclusive CaF ₂ NIR Beamsplitter
Wavenumber Precision	$\leq 0.02 \text{ cm}^{-1}$
Signal to Noise	$\geq 40,000:1$
Photometric Accuracy	$\leq 0.1\%T$
Interferometer	High stability Cube corner interferometer
Software interface	Window 7/10
Operating temperature / humidity	5 to 35°C / non condensing
Storage temperature	-10 to 60°C
Power	220V $\pm 10\%$, 50-60Hz
Communication interface	Ethernet or adaptor to USB2.0
Optical fiber input	SMA 905 connector
Dimension	300 × 300 × 200mm

2. Exclusive FT-NIR spectrometer Software

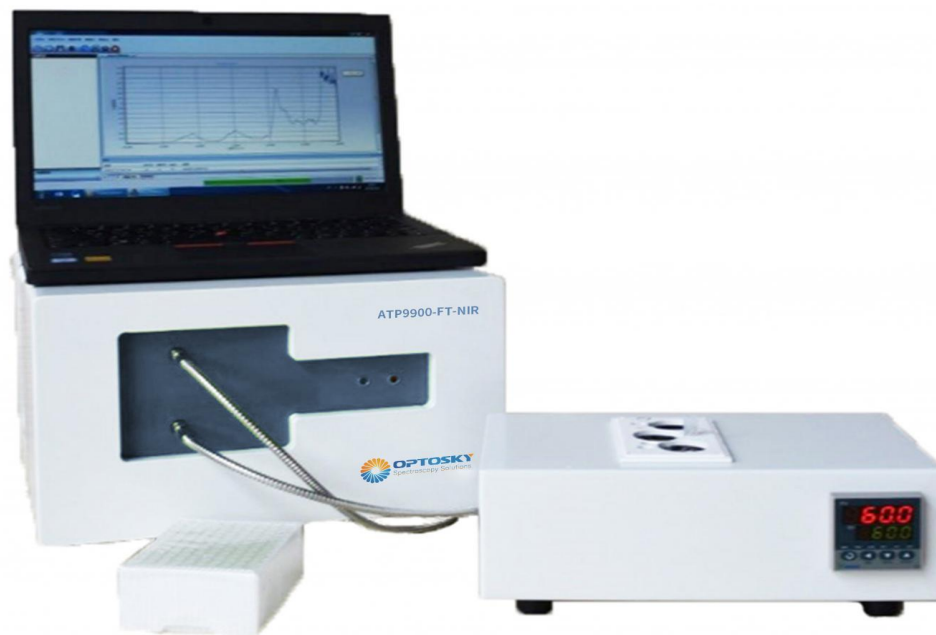
- **IR-software** is operated in the windows 7/10 at graphics command, easy-to-operate FT-NIR spectrometer to control acquisition and spectra.
- **Chemometric-software** is developed the methods automatically and manually, transfer the methods database between spectrometers, chemometrics prediction function.
- **Automatic-software** is easy to combine the spectra acquisition, methods call, and result prediction to measure sample and export result.
- **Online-software** is used to monitor in process export measure result to DCS controller, connectivity to 4-20mA, Modbus, Profibus DP and OPC.

3. FT-NIR Spectrometer Solutions

FT-NIR spectrometer is widely applied to fast analysis organic contents and various parameters. ATP9900-FT-NIR spectrometer works with any attachment to perform many measurements.

1) Transmission Module with temperature controller:

This external transmission temperature control module is used for heating, temperature control and sampling of liquid samples. Liquid samples are directly added to the sample tube or cuvette with different optical path with an eyedropper. The heating function of the module can also be used for samples that need to be heated and melted. Spectra are collected after the sample becomes a uniform liquid sample. With this module, the ATP9900-FT-NIR can realize the laboratory routine liquid transmission analysis, and the Automatic-software software can be used to quickly analyze and detect the liquid samples.



Module Performance:

Optical components : gold-plated flat mirror, lens combination

Temperature control range : room temperature to 150 C

Sample bottle diameter size : 8mm/22mm

Cuvette optical path : 2mm/5mm/10mm

Connection mode : SMA905 port

2) Immersion type probe for liquid and solid:

The most basic application is the ATP9900-FT-NIR host with classical diffuse, transmissive or transmissive probes of different path lengths. In this basic application, the host connects a flow cell or immersion probe via fiber optics for solid or liquid analysis and the probe can be equipped with different materials, such as stainless steel, Hastelloy or ceramic, according to the nature of the material.



3) Reflectance Probe for solid:

The handheld solid probe is composed of hundreds of 200um fiber bundles, which are connected to the spectrometer through SMA905 Button for sampling control. This set configuration can be used in the pharmaceutical industry for the direct measurement of solid samples such as tablets/powder raw materials, spectra can be performed across packaging bags/glass packaging bottles, etc Measurement, can also be directly hand-held contact with a variety of solid samples for reflection measurement.



Module Performance:

Spectral range: 12500-4000 cm⁻¹

Probe material: low hydroxyl quartz, 200um, the number of hundreds of pieces of composition, stainless steel package

Probe fiber length: 1-5 m optional

Probe diameter: 10mm, length optional

Sampling method: hand-held reflection

Resolution: <2cm⁻¹

4) Contact-less Reflectance Probe :

The external dual light source of this module simultaneously irradiates the solid sample, and the reflected spectral signal converges into the detector through the optical system inside the module, which greatly improves the spectral collection efficiency and signal-to-noise ratio. With this module, the ATP9900-FT-NIR can collect the reflection spectra of solid samples.



Module Performance:

Probe material: 316 stainless steel

Probe light window: Sapphire

Probe size: 154mm (height) *144mm (diameter)

Focusing distance: 90mm

Light source: 24V, dual light source

Sampling method: non - contact reflection

Wavelength range: 4000-12500cm⁻¹(800-2500nm)

Resolution: <2cm⁻¹

5) PAT Analyzer with 8-port channels

ATP9900-FT-NIR can be expanded into 8 channels of online detection host, each channel through the NIR special fiber connection site probe or flow pool, collected to the field measurement point material near infrared spectrum, and the spectral signal transmitted to the host detector; The content of key components of each measurement

point is predicted by Online software, and the Online monitoring software transmits the measurement results to DCS control room in real time, which provides accurate and timely data information for production monitoring, process adjustment, quality control and so on.



Technical specification:

Connection mode: SMA905 port

Wavelength range: 4000-12500cm⁻¹(800-2500nm)

Resolution: < 2cm⁻¹

Size: 540mm*350mm* 650mm (length * width *height)

Weight: 10Kg (without spectrometer)

6) Diffuse reflection of the solid integrating sphere instrument:

Specifically designed to meet the needs of laboratory measurements of various forms of solid samples, the integrated structure makes installation and measurement very simple. The integrating ball has a built-in gold-plated background, which can be automatically deducted when measuring.

The principle of optical path of integrating sphere makes diffuse reflection measurement more uniform and reliable. For non-uniform samples such as solid particles, we also provide an accessory scheme of rotating sample cup. The software automatically controls the sample cup to conduct sampling analysis while rotating, and the area of the measured sample can reach tens of times of the fixed position, which greatly enhances the representability of the measurement spectrum.



Technical parameters:

Interferometer: High stability Cube corner interferometer

Light source: imported high performance near infrared light source

Laser: solid state laser, service life of 10 years

Beam splitter: CaF₂ beam splitter for near infrared

Spectral range: 12500-4000cm⁻¹ (800-2500nm)

Detector: High sensitivity InGaAs detector

4. Application

- Chemical industry: hydroxyl value, iodine value, saponification value, moisture, etc. of polyether polyol; polyurethane
- NCO, viscosity, etc. of ester; vinyl content in silicone rubber; acetic acid synthesis process
- Medium iodomethane, acetic acid, moisture, etc.
- Petrochemical industry: octane number, olefins, aromatics, distillation range, etc. in gasoline blending

- Pharmaceutical industry: content of active components of medicine, effective components in the process of extraction and concentration of traditional Chinese medicine
- ingredients and solvent content
- Feed industry: various raw materials, moisture, protein, fat, amino acid, etc.
- Food industry: water in edible oil Food industry: water in edible oil, protein, iodine value, unsaturated fatty acids, etc.; meat
- Protein, fat, moisture, etc. in products
- Textile industry: cotton, hemp, spandex, nylon content in textiles, etc.