

Scientific Raman Spectrometer

ATR3120

Features

- High sensitivity detector;
- The sensor is cooled to -10 °C or -25 °C;
- Android operating system, 8-inch capacitive touch screen;
- Internal memory can store more than 100,000 spectra;
- Detachable fiber optic Raman probe;
- Ultra-low noise circuit;
- Powerful PC-side spectrum analysis software;
- Peak search and display;
- USB 2.0;
- Built-in lithium battery (optional), battery life >4h
- Friendly human-machine interface;

Application

- Biological science
- Pharmaceutical engineering
- Forensic analysis
- Agriculture and food safety
- Gemstone
- Environmental science

Description

The ATR3120 desktop Raman spectrometer uses a cooled high-sensitivity CCD, which is suitable for long integration times. ATR3120 uses fiber optic probe, which is suitable for laboratory scientific research. The test results are accurate and reliable. The excellent low stray light design makes the ATR3120 adaptable to use in complex environments. Suitable for work in scientific research, food safety, pharmaceutical engineering and other fields.

ATR3120 has built-in multi-functional software that is shipped with the machine. After nearly a hundred versions of updates, the functions are very complete and stable, and it is suitable for the development of Raman research work.

ATR3120 can provide the following excitation wavelengths: 266nm, 325nm, 405nm, 532nm, 638nm, 785nm, 830nm, 1064nm. The above excitation wavelengths are optional, and other excitation wavelengths can be customized.



1. Specifications

ATR3120 Operating System	
Interface	USB 2.0
Built-in lithium battery (optional)	Battery life>4 hours
Integration Time	4ms-10min
Voltage	DC 5V(+/-5%)
Operating Temperature	-10~45°C
Working Humidity	< 95%
Dimensions (L*W*H)	36×28.8×19.8 cm ³
weight	7kg
computer platform	
Operating System	Android
Memory	8G
Harddisk	32G(Can store more than 100,000 spectra)
Screen	8-inch capacitive touch screen
Resolution	1280X768
Reliability	
Spectral stability	$\sigma/\mu < 0.5\%$ (COT 8 hours)
temperature stability	spectrum shift $\leq 1 \text{ cm}^{-1}$ (10-40 °C)
Spectral intensity change (in 5 ~ 40 °C)	< $\pm 5\%$
Detector	
model	High sensitivity and rapid cooling CCD
Spectral range	200-1100 nm
Effective Pixels	2048*64
Dynamic Range	50000: 1
Cooling temperature	-10 °C or -25°C
Pixel size	14 μm ×14 μm
Full well capacity	300 Ke ⁻
Sensitivity	QE>40%, 6.5 $\mu\text{V}/\text{e}^-$
Excitation light	
central wavelength	Lasers specified by suffix, $\pm 0.5\text{nm}$
half width	<0.08 nm

Output Power	Related to lasers, please see Table 1 for details
Power stability	$\sigma/\mu < \pm 0.2\%$
Raman probe	
working distance	6 mm
Transmission rate	OD>8
numerical aperture	0.3
Aperture	7mm
Raman probe fiber length	1.5m

2. Optical Performance

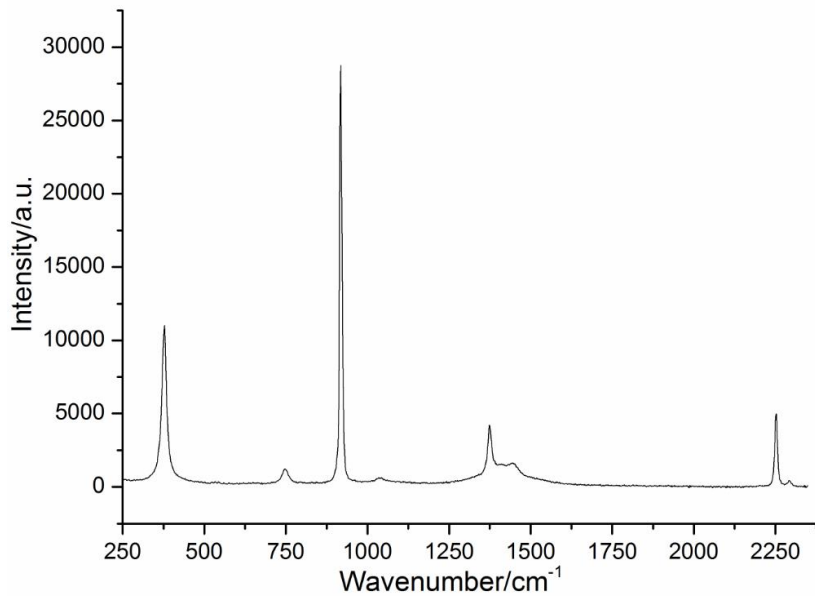


Figure 1 Raman spectra of acetonitrile

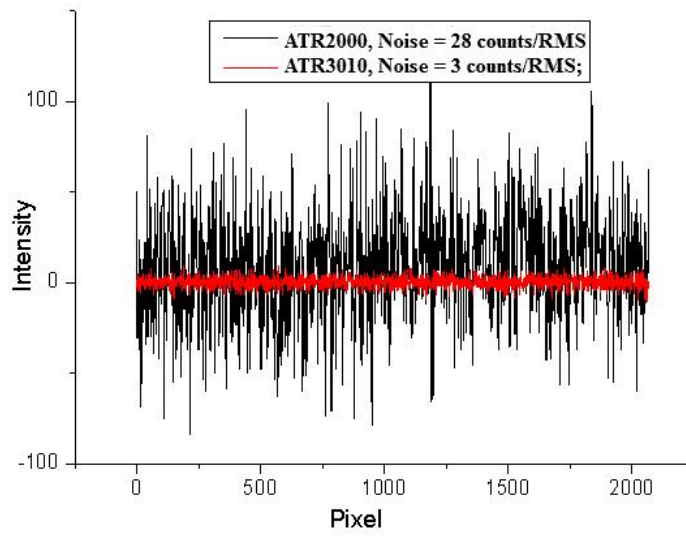


Figure 2 Noise of ATR3100 vs ATR2100

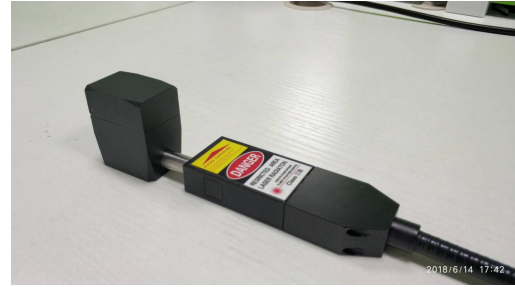
3. Selection Guide

model	Excitation wavelength/nm	Laser power/mW	Wavenumber range	resolution	Application
ATR3120-266	266	50	200-3000	7~10	Suppress fluorescence
ATR3120-325	325	100	150-3500	5~8	Suppress fluorescence
ATR3120-405	405	100	150-3500	4~7	
ATR3120-532	532	100	150-3700	3~6	Graphene, coal, biological samples, two-dimensional materials, SERS, etc.
ATR3120-638	638	50	200-3500	3~6	Metal oxides, new materials
ATR3120-785-27	785	500	150-2700	3~7	Suitable for most applications
ATR3120-785-35	785	500	150-3500	4~8	
ATR3120-785-42	785	500	150-4200	5~9	
ATR3120-1064	1064	500	200-2600	7~12	No fluorescence interference, especially suitable for dark samples, colored samples and other samples with strong fluorescence properties, such as pigments, biological samples, etc.
ATR3120-830	830	500	200-3500	3~8	It can better penetrate human skin and is suitable for measuring biological samples, such as non-invasive blood sugar and early cancer detection.
ATR3120LT Deep cooling to -25°C, ultra-long integration time (up to 1.3h)	The excitation wavelength can support: select up to three types from 532, 633, 785, 830, and 1064nm	Parameters are the same as above	The wave number range is about 20% narrower than the same excitation wavelength mentioned above, and 1064nm remains unchanged.	Slightly lower resolution than non-LT version	

ATR3200: Dual-wavelength Raman spectrometer, 532, 633, 785, 830, 1064nm excitation light, choose two;

- Tested according to the American national standard ASTM E2529-06 method;
- If specially customized, the resolution performance can be improved by about 1/3, but sensitivity will be sacrificed;
- The units of wave number range and resolution are cm-1.

4. Measuring attachment



Fluid sample cell (Thermo bottle)



Fluid sample cell (Liquid chromatography bottle) (Optional)



Raman probe gun (optional)



Test adjustment stand (optional)