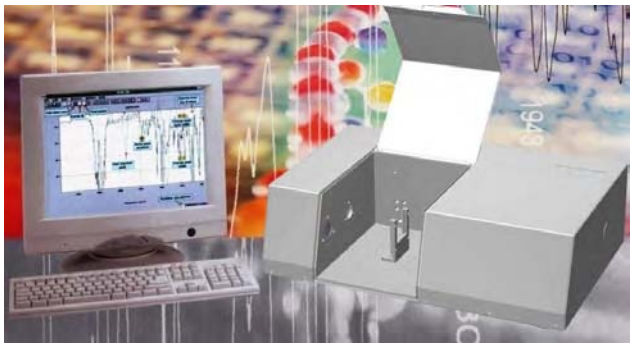
TEO200 BENCHTOP FTIR SPECTROMETER



The Model TEO200 benchtop FTIR spectrometer is a low cost Fourier transform infrared spectrometer that employs a number of unique features to achieve high performance from such a compact size. At just 59 x 39 x 19 cm, it is one of the most compact FTIR systems on the market today.

The TEO200 is unique in terms of its optical geometry and software/firmware design. The optical geometry is simplified by employing a new and remarkably compact Michelson self compensating optical system that eliminates many of the optical alignment problems found in conventional linear and pendulum type optical interferometers. For example, the TEO200 design avoids the use of conventional corner cube optics and dynamic alignment. In practical terms, the instrument can be used inside a research laboratory, or even as a mobile unit in outside environments. Its software and firmware design is also tightly coordinated which significantly reduces overall data acquisition and computational time.

The sealed, desiccated enclosure of the TEO200 eliminates the need for continuous dry nitrogen purging during operation. Other notable features include an air cooled IR source as oppose to water cooled, and the interferometer mechanical bearing does not require gas supply. There are however, three dry nitrogen gas inlets on the rear of the spectrometer for the purging of the detector compartment, sample compartment, and interferometer compartment from moisture, carbon dioxide and other gases.

HIGHLIGHTS

- Compact self aligning Michelson FTIR
- Standard 2cm^{-1} Unapodized Resolution Optional 1 cm^{-1}, 0.5 cm^{-1} Resolution Available
- 7000 ~ 400cm^{-1} wavelength range
- Multi-layer coated KBr beam splitter
- High Emission Air cooled IR Source
- DLATGS low noise pyroelectric detector
- HeNe laser interferometer wavelength calibration and control system
- Sealed Interferometer Unit against humidity
- Windows 98/XP spectroscopic and analytical software
- 1 Year Warranty

Description	Version Code	Price (USD)
Standard 2cm^{-1} Resolution Version	-2cm^{-1}	

Instrument Performance

The TEO200 FTIR offers high S:N ratios and can provide SNR up to 12000:1. Resolution in the infrared is available 2 cm^{-1} and programmable up to 32 cm^{-1} (option 0.5 and 1 cm^{-1}). The overall wavelength range is 7000 to 400cm-1 (IR) or 15000 to 3850 cm-1 (NIR).

Built-In Sample Compartment

A large transmission sample compartment is built into the instrument to accommodate most typical sample handling requirements relating to FTIR spectroscopy. The sample compartment can be equipped with a sampler holder that accepts slide-mounted samples as well. This unique compartment can also accommodate the wide range of accessories supplied by specialist accessory manufacturers. Overall dimensions of the sample compartment are W20 X D26 X H16 cm. The optical axis is 74.5 mm above the base of the sample compartment and there is free space of 90 mm above the optical axis to the underside of the lid.

IR Source

The radiation source is situated on the back side of the spectrometer. The IR source is a high intensity long life device made from a special alloy wire to achieve excellent instrument sensitivity and stability. Neither

cooling water nor purge gases are required for this unique low power infrared source. The source is housed so as to achieve a very high operating temperature with minimum power. The colour temperature of the source is about 1200 °C and the heating power is about 15 W. The applied voltage is stabilized using a feedback loop driving a switched mode power supply.

Extended Wavelength Ranges

In order to facilitate the use of more than one beam splitter or detector, provision has been made to interchange the beam splitter and detector assemblies allowing the Sciencetech TEO200 to be used at any wavelength from 15000 to 400 cm^{-1}.

- KBr 7,000 to 400 cm^{-1} (25µm-1.42µm)
- ZnSe 5,000 to 500 cm-1 (20µm-2.0µm)
- CaF2 10,000 to 1,000 cm^{-1}(10µm-1.0µm)
- Quartz 15,000 to 3,000 cm^{-1} (3.3µm-0.6µm)

Please note that beam splitters range is subject to coatings.

Detector Options

The detector compartment can be purged using dry nitrogen by way of a purge connector at the rear of the spectrometer. The standard detector is a selected high sensitivity DLATGS pyroelectric design providing the highest possible signal to noise for all but the most demanding applications. However there are many applications in infrared spectroscopy where high resolution analysis is required for materials with high absorption characteristics and for these applications cryogenically cooled MCT detector options are available each with a specific wavelength range. In case of NIR spectral region two types of photodiodes are available: Si and InGaAs.

SOFTWARE

Windows software is supplied on CD and provided with each system shipped. The software includes features for all standard analytical requirements including manipulation of spectral data, instrument control, plotting with preview on the screen plus many others. Also included are several facilities for analytical modeling of interferogrammes or spectra, with smoothing, and baseline correction, interactive editing and data manipulation. Also spectral subtraction, mixture subtraction, smoothing derivatives, plot with preview etc. Data input and output is possible
in ASCII or JCAMP. Other commercial programs can be used including Thermo/Galactic GRAMS for features such as Library Search. The software program is written in 32 bit protected mode. Our unique software has been designed specifically for multi function applications, it is easy to use and it is provided free of charge. The utility of the software program can be extended by adding other commercial programs such as search, component identification, Kramers Kronig Transform, Chemometrics, etc. to suit individual requirements.

Air Cooled Infrared Source

Our Infrared source is a long lifetime and trouble free operation device. The reason is simple in that our design achieves excellent wavelength emission characteristics and very high stability. The colour temperature of the source is about 1200°C. In the NIR region a quartz-halogen lamp is used.

Desiccated and Sealed Interferometer

The Sciencetech TEO200 series of instruments employ a sealed and desiccated interferometer and detector compartment, ensuring high spectral integrity with low levels of water vapour within the interferometer. We also offer a version (200-XZ) that employs a ZnSe moisture insensitive optics to be impervious to water vapour and can be used to advantage in serious tropical environments. Provision is made for purging should this be of interest to the user. Near infrared version (200-XN) employs a fused silica optics and is insensitive to any influence of water vapour.

ACCESSORIES

Cryogenically Cooled MCT Detector Upgrade

The standard detector is a high sensitivity DTGS (Deuterated triglycine sulphate) pyroelectric design providing the highest possible signal to noise for all but the most demanding applications. However there are many applications in infrared spectroscopy where fast, high resolution analysis is required for materials with high absorption characteristics and for these applications a number of cryogenically cooled detector options are available including MCT detectors each with a specific wavelength range. Each detector type

is supplied mounted and pre-aligned on simple to use and easily changeable mounts.

Preconfigured Host Computer System

Sciencetech instruments and software are designed to work on MS-Windows based PC computers. Since the installation and software configuration of such a computer system can be tedious and complex, Sciencetech offers a completely configured Host PC computer with all software and PCI boards installed and functionally tested with the instrument. This preconfigured host computer will be a Windows XP mid-grade computer with 15" flat panel LCD monitor and network adapter. The cost of the software itself and AD boards are priced separately. Sciencetech strongly recommends the customer purchases this preconfigured computer with their instrument if the system control is complex or if the customer is unable to take advantage of Sciencetech's off site warranty support should they be unable to configure the software themselves. Sciencetech is not responsible for the configuration of its software on third party computers not provided by Sciencetech as there could be conflicts in setup and configuration with other software or hardware.

SPECIFICATIONS

Spectral range	Standard: 7000 - 400 cm^{-1} Optional: 7800 - 400 cm^{-1}
Resolution (Unapodised)	2 cm^{-1} (Option: 1.0 and 0.5 cm^{-1})
Wave Number Precision	0.01 cm^{-1}
Ordinate Precision	0.1 - 0.01 %T
Interferometer	Michelson type, self-compensated for tilt and shear
Beam Diameter	25 mm
Aperture Ratio	f/3.2
Operation Mode	Single Channel
Throughput	0.015 cm^2sr
Beam Splitter	KBr Substrate, Multilayer Coated Option: ZnSe Substrate
Scanner	Pendulous Scan
Scanning Rate	1.6 mm/s,
Frequency Reference System	He-Ne Laser, 633 nm
Sampling	Conventional
Sample Compartment	single beam, 200/260/160 mm
Beam Size	10 mm - Centre Focus, Beam Center 74.5 mm Above the Base plate
Input Port (Option)	Entrance Port for Radiation from External Sources
Source	Coil form, Air Cooled
Detectors	Standard: DLATGS Pyroelectric; Option: LN_2 MCT
Atmosphere	Sealed, with Ports for Dry Nitrogen or Air
A/D converter	16 bit, 100 kHz
Computer	IBM PC Pentium or Similar
Operating system	Windows 95/98/XP
Display	SVGA (1024 x 768 pixels recommended)
Dimensions (w/d/h)	590/390/190 mm
Weight	24 kg
Power Consumption	100 - 240 VAC, 40 W, 50/60 Hz 12 VDC
Temperature Environment	18 °C to 28 °C
Humidity Environment	Below 65%, Non-Condensing