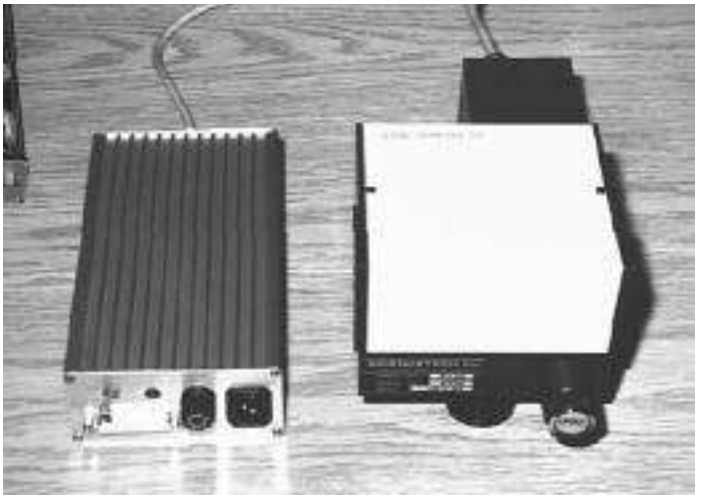
Accessories

Motor Drive Units



Sciencetech model MD-100 motor drive unit and Model 9030 monochromator

Sciencetech motor drive units are specifically designed to drive a family of stepper motors for our line of monochromators.

The controller includes a microprocessor with a set of programmed commands so that your processor is not burdened with actual pulse running of the motor. The controller allows the selection of two stepping modes: micro-stepping or half stepping. In the micro-stepping mode very high scanning resolution is achievable, with 10 µs per full step. Selection of the half-step mode allows faster scanning speeds.

The MD100 features serial port control so that it can be interfaced with any computer. When purchased with a monochromator, it has one or two end-travel switches for reference positions.

The unit can be wired for all world voltage. It comes with an RS232 cable with DB25 connector, cable and monitor.

Motors with 200 or 400 steps per revolution are available. A high torque motor with 200 steps per revolution is included in the MD200 motor drive system.

Typical maximum scanning speeds are 150 µsec/µstep and 500 µsec/half-step. As an extra option a system that can reach 100 µsec/µstep can be supplied. To calculate the maximum motor speed, multiply the time per step times the number of steps. For example this would yield 5 revolutions per second for the motor with 200 steps/rev. in half-step mode.

Technical Specifications

Dimensions: 8" x 4" x 2"
Weight: 3 lbs
Fusing: 1A, 115V, 60Hz
Voltage: 115, 230, 100, 240 V (Internally configured)
Motors: 11oz-in torque, 200 or 400 steps per revolution
22.2 oz-in torque, 200 steps per revolution
44.4 oz-in torque, 200 steps per revolution

Steps per Revolution:

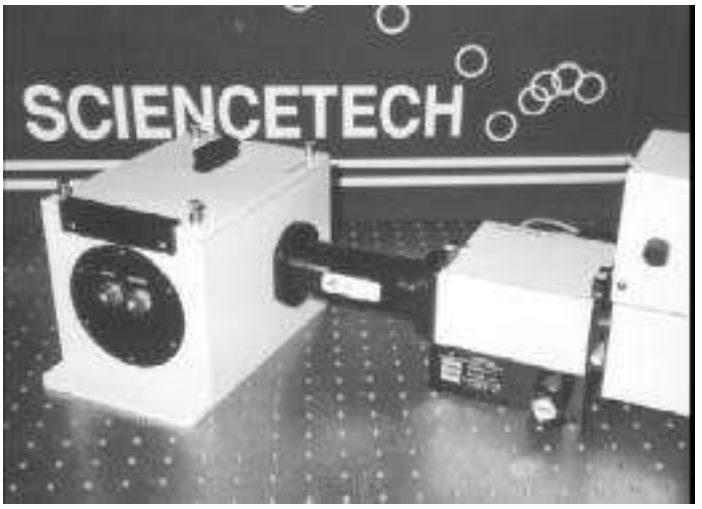
	200	**400**
Number of micro steps per step:	10	10
Number of half steps per step:	2	2
Max. step rate in half-step: (microseconds/half step starting)	700	500
Max. step rate in half step: (microsec/half step running)	500	400
Max. step rate in micro step: (microsec/micro step starting)	150	140
Max. step rate in micro step: (microsec/micro step running)	140	140
Max. run vel. in half step mode: (rev/sec)	5	3.1
Max. run vel. in micro step mode: (rev/sec)	3.5	1.8

For monochromator with 100 nm/rev.

Max. scan rate in half step mode: (nm/sec)	500	310
Max. scan rate in micro step mode: (nm/sec)	350	180

Version Model	Version Description	Version Price (USD)
MD100	Motor drive with controller	—
MD200	Similar to MD 100 with larger motor	
MD-CONT	Controller only	

Transmission/Fluorescence Sample Chamber



Sciencetech Model SC3200 Transmission/Fluorescence Sample Chamber

The Sciencetech SC3200 Transmission/Fluorescence Sample chambers have a T optical arrangement. They come with one input and two exit ports ready and can be used for fluorescence, transmission, or scattering measurements. Ambient light cannot reach the sample since the SC 3200 features a light tight design. A firm lid with a gasket is supplied to cover a port not in use. The top chamber lid can be easily removed for quick sample insertion.

The model SC3201 includes a holder for mounting a standard 10 mm cuvette (10 x 10 x 45 mm). The SC3204 includes a carousel for 4 cuvettes. Control of the carousel can be manual or automatic with stepper motor and electronics. The fourth lateral wall of the chamber contains a supply panel for electronics for control of shutters, sample cooling, stepper motor of the sample carousel, and magnetic stirrers.

All three exit ports of the sample chamber are prepared for mounting an electronic shutter of 25.4 mm of aperture and 63 mm outside diameter.The shutter is activated by a micro switch. When the lid is removed, the shutter is closed, preventing light from reaching and damaging detectors when lid is open.

The SC3201 is prepared for optional thermoelectric cooling or heating of the sample.The fourth lateral wall of the chamber allows access for the cooling electronics. The sample or sample holder are mounted on a base with good thermal insulation.

The model S3220 is prepared for HPLC flow-through cells. Liquid input and output is through high pressure stainless steel fittings. The HPLC cell can be removed and replaced by a standard 10 mm cuvette for spectrophotometric applications.The sample chamber mounting surface includes 4 mounting holes for easy attachment to optical tables.

Technical Specifications

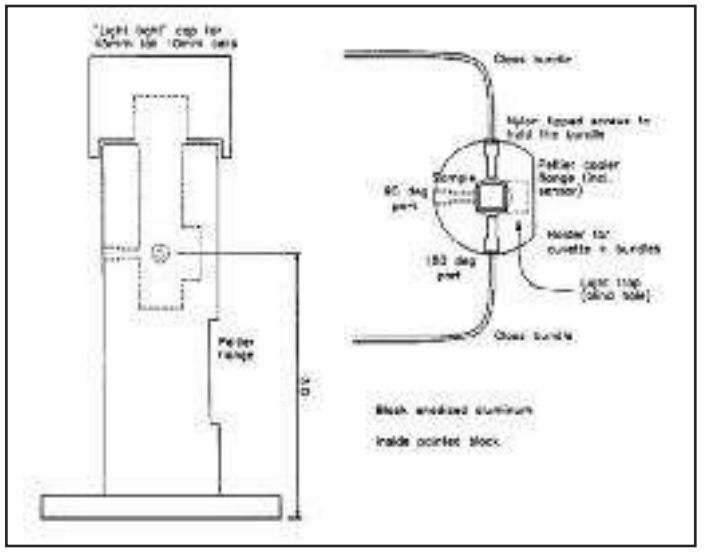
Overall Dimensions: 10.75" (l) x 5.75" (w) x 6.12" (h)
Chamber Dimensions: 8" x 5.75" x 6.12"
Ports: 1 input, 2 output ports
Port Size: 1 3/8 "
Optical axis height: 3"
SC3201 distance to sample &
SC3202 distance to centre of carousel:
- **From Input port:** 2.875"
- **From Transmission port:** 2.875"
- **From 90° (fluorescence) port:** 2.875"

Sample holder: Standard 10 mm x 10 mm cuvette
- **Model SC3201:** 1 cuvette
- **Model SC3204:** 4 cuvette in carousel
- **Model SC3220:** HPLC flow cell, 8 µl volume with 10 mm optical path. Quartz window 1 mm diameter. Stainless steel tubing.

Mounting holes: 4.28" diameter in a 4" x 10" square
Other features: Supply panel for electronics. Every port accepts electronic shutter with 25.4 mm aperture and 63 mm outer diameter. Lid removal activates shutter.
Options:
- Magnetic stirrer (model 3210), for SC3201 and SC3204
- Electromagnetic shutter (for any port in both models)
- Thermoelectric cooling (for SC3201)
- Stepper motor and controller (for SC3204)

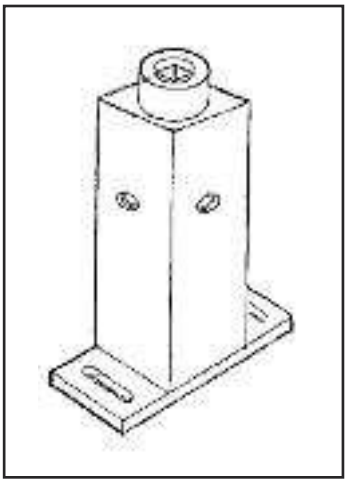
Version Model	Version Description	Version Price (USD)
SC3201	Transmission / fluorescence sample chamber	
SC3220 HPLC	sample chamber	
SF3250 T/F	sample chamber with thermo-electric cooling	
SC TC	Power supply temperature controller for Peltier Sample Chamber	
SC3210	Magnetic stirrer	P.O.R.
Coupling tube for sample chamber to monochromator		
CO-CM	with 1” optics:	P.O.R
	with 1.5” optics:	P.O.R
Coupling tube as above with quartz optics		
CO-CM-Q	with 1” optics:	P.O.R
	with 1.5” optics:	P.O.R

Fibre Optic Transmission / Fluorescence Sample Chamber



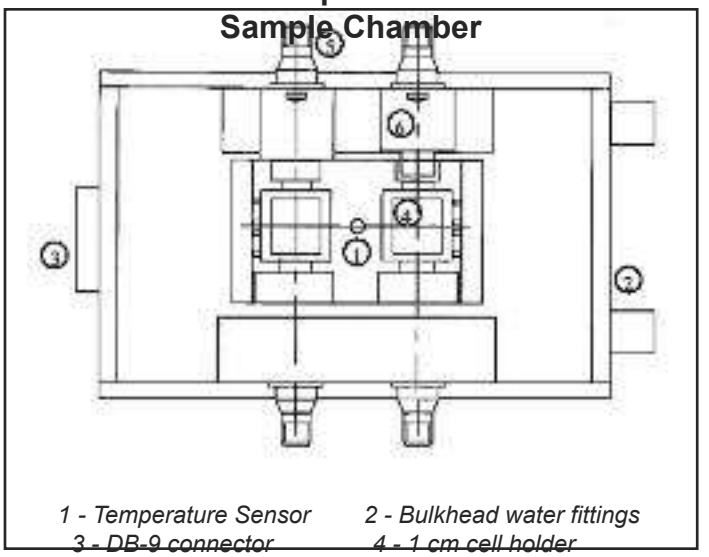
The SC3310 sample chamber allows mounting of standard 10 mm spectrophotometer or fluorescence cells in a light tight configuration (light tight housing not shown in diagram).

The SC3310 features three ports for fibre optic input and output and includes slots for breadboard mounting. Includes flange for mounting of optional Peltier cooling system.



Version Model	Version Description	Version Price(USD)
SC3310	Transmission / fluorescence fibre optic sample chamber	7
SC3311	Transmission / fluorescence fibre optic sample chamber with temperature control (not including controller or power supply)	
SC3250P	Regulated variable power supply for temperature control	
PMH-TC	Power Supply temperature controller for Sample Chambers	P.O.R
SC3320	Dual beam temperature controlled sample chamber (inc. controller)	

Dual Beam Temperature-Controlled Sample Chamber



1 - Temperature Sensor *2 - Bulkhead water fittings*
3 - DB-9 connector *4 - 1 cm cell holder*
5 - SMA fibre connectors *6 - Adjustable collimating optics*

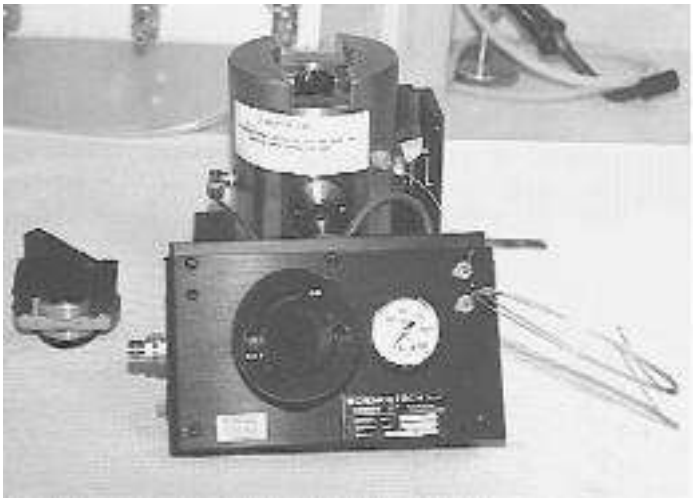
Sciencetech's SC3320 dual beam sample chamber allows for transmission measurements of two liquid samples (or sample and reference) in standard 10 mm optical path cells. The SC3320 features thermoelectric temperature control. Both cooling and heating of the samples is possible and both samples are held at the same temperature. Good temperature contact is achieved by mounting the sample cuvette on a thermal block. The system includes an ultra-stable temperature controller with digital display. The controller can be set and read from the panel or from a host computer.

Input and output ports are equipped with SMA fibre optic cables. Matching aperture fused silica lenses collimates the light from the input fibre and re-focuses it to the output fibre. Focus adjustment allows for maximum light throughput.

Technical Specifications

Sample Holder: holds two standard cells
Inputs/Outputs: Two fibre optic input and two fibre optic output ports with SMA fibre optic cables
Optics: Adjustable focus UV fused silica coupling optics
Thermoelectric Temp. Control: with water:
w/o water:
Temperature Controller: Ultra-stable with digital display
Analog Interface Features: TE V, TE I, Temp Set and Actual Temp outputs
remote output ON/OFF control
external control of operating temp.
Dimensions: 4.5"(h) x 4.5"(w) x 5.5"(l)
(11.25 cm x 11.25 cm x 13.75 cm)

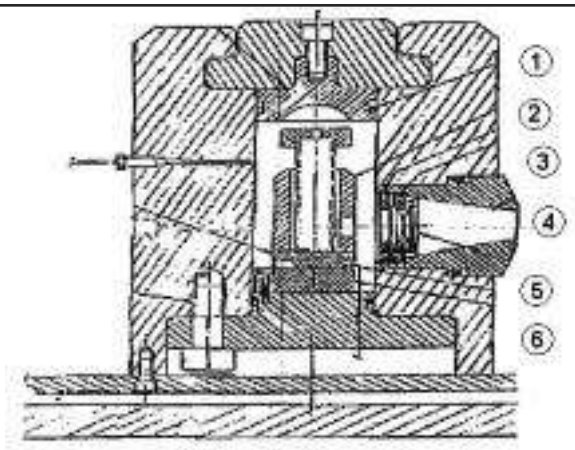
Hyperbaric Cell Model 3100r



The Sciencetech 3100 hyperbaric cell allows fluorescence and transmission measurement under pressures of up to 200 atm (2x104 kPa, 2900 psi) of liquid samples using a standard 10 mm cuvette. It includes three ports with quartz windows, an excitation port, a 90° port for fluorescence measurements, and the third port for the optional 180° fluorescence/transmission measurements.

The cell is constructed of stainless steel with three conic quartz windows. The conic apertures are accurately matched to the quartz plugs to distribute stress. Safety interlocks allow cell pressurization only when the chamber is properly closed. All auxiliary optics are quartz to give an extended wavelength operation range.

The standard model also includes a retrofit to the Hitachi F4010 fluorometer system. The retrofit consists of a new tray, high pressure gas piping (and liquid piping if the option has been ordered), beam steering optics, and the high pressure chamber. The tray fits in the existing mounts, with the piping routed in such a way to allow installation without modification of the instrument.



1 - Cell Holder *2 - Lens Retainer*
3 - Quartz Window *4 - Lens Heater*
5 - Fluorometer *6 - Optic Plate*

Technical Specifications

Operating pressure: 1 to 200 atm
Wavelength range: 210 to 2700 nm
Material: Stainless steel with all quartz optics and windows
Chamber dimensions (external): 120 mm diameter, 110 mm high
Tray dimensions: 182.9 mm x 175.3 mm
Windows:
- **Material:** Quartz
- **Surface quality:** I/2
- **Cone angle tolerance:** 1 minute arc
- **Ext. truncated cone area:** 11 mm diameter

Window thickness: 30 mm
Sample holder:
- **Material:** Quartz
- **Dimensions:** 12 x 12 x 35 mm

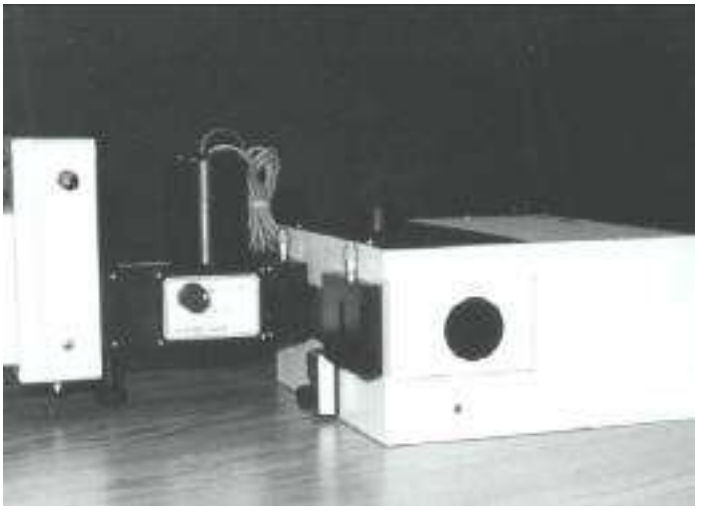
Standard optical configuration: 90° and 180° ports, observation through the 90° port.
Options: Optics, swing-in mirror for access to 180° port. Sample insertion and removal under pressure. Heater with controller.
Qualification test: Prior to delivery, hyperbaric cell is subjected to pressurizing cycles.
Pressure: 9000 psi, No. of cycles: 32
Cycle duration: 1 Hr each for 2 cycles. One minute for the other 30 cycles.

A system of lenses inside the chamber and mirrors are used to image the sample region inside the hyperbaric cell to positions outside it. Additional input and output optics outside the chamber project the image to the normal intersection of the fluorometer excitation and fluorescence beams, where the sample would be located if the high pressure chamber was not needed. The optics are designed to provide the maximum efficiency in illumination and collection of light from the sample area. The vertical and horizontal directions of both the input and output beam can be aligned independently.

The standard (90°) measurements can be switched to transmission (180°) measurements with optional optics that include a swing-in mirror to switch the chamber output port. Optional external connections allow insertion and/or removal of liquids from the cuvette under pressure. Optional heaters with a microprocessor controller allow the sample temperature to be varied from 45 to 120°C or from 70 to 200°C.

Version Model	Version Description	Version Price (USD)
3100	Hyperbaric Cell	P.O.R

Dual Detector Port



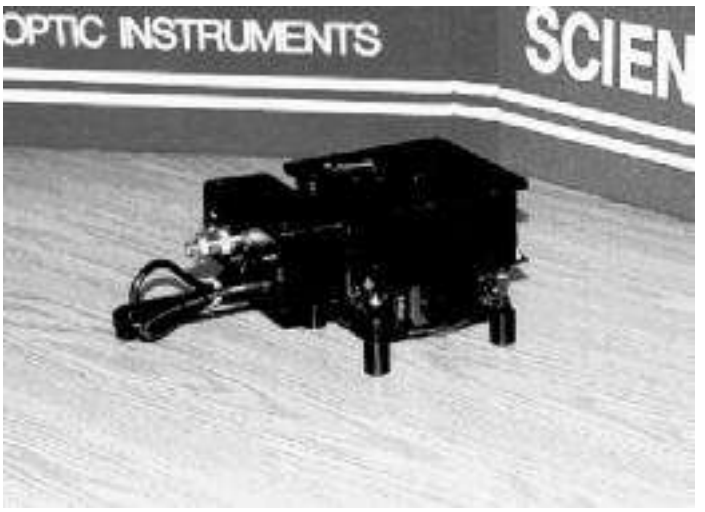
Sciencetech Model HDT2 Dual Source/Detector Housing

Sciencetech dual detector housing allow two detectors to be used at any output port of a Sciencetech monochromator. The standard unit mounts a Sciencetech photomultiplier housing on one port and a semiconductor detector such as Si, Ge or InGaAs in the other port. The two output ports include a lens system to focus the output slit of the monochromator into the detectors. Fused silica lenses are used for UV/VIS detectors. The model HDT2-FM includes a flipping mirror controllable from the outside for detector selection. The HDT2-DM has a dichroic mirror to divide the output beam of the monochromator into two according to spectral range. Short wavelengths are transmitted through the mirror to one detector and long wavelengths are reflected towards the other. Dichroic mirrors with edges from 700 nm to 1 µm are available.

The HDT300 is a computer controlled lamp switch. The switch allows switching between Arc lamps and QTH sources. This is also an accessory to the Sciencetech motorized monochromators. The switching mirror drive motor is a 12 V, 76 Ohm per winding, 200 step per revolution stepper controlled by a microprocessor. The controller for this motor is connected to the Sciencetech FWG filter wheel motor or to the 9055 monochromator motor and may only be accessed by communication with their controllers. The switching mirror has two optical edge sensors and the motor controller moves the mirror from one edge sensor to the other.

Version Model	Version Description	Version Price(USD)
HDT2	Dual source / detector housing with optics, manual selection	
HDT 300	Automatic switch accessory	

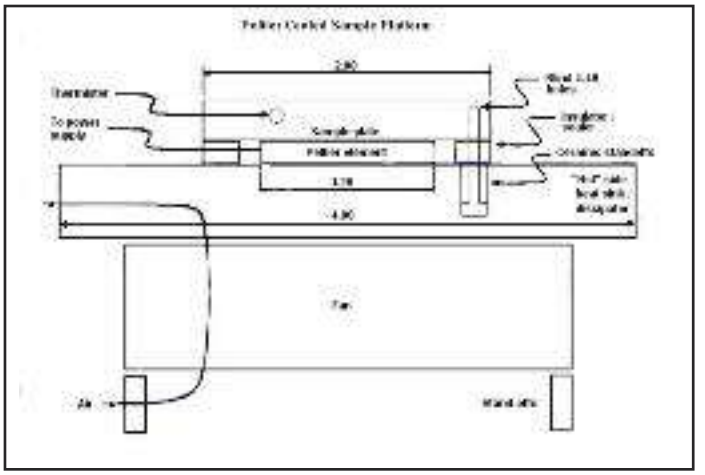
Peltier Heater/Cooler Sample Platform



Sciencetech Model SC3250 Peltier Sample Platform

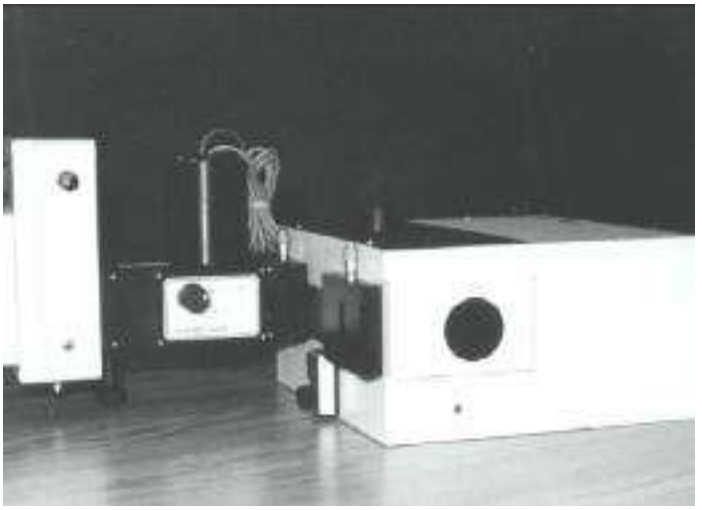
The Sciencetech SC3250 Peltier sample platform includes a heat pump head and upper sample holder platform which is 2" square made of black anodized aluminum. Also includes lower heat sink with a fan. Heating and cooling are possible from 0 to 90°C.

The SC3250 can be supplied with the Sciencetech PMH04 temperature controller/power supply or with the Sciencetech 3250/P variable power supply. The 3250/P supplies 0-16°C with greater than 0.5% load regulation.



Model	Description	Price (USD)
SC3250	Peltier / Cooler sample platform	P.O.R.
SC3250P	Regulated, variable power supply for Peltier system	P.O.R.
SCTC	Power supply for Peltier Sample Chambers	P.O.R.

Recirculating Coolers



Sciencetech Model 271-REC Recirculating Cooler

Sciencetech's recirculating coolers allow closed loop liquid cooling of equipment with a power of up to 300 W using the 271-REC and up to 1.6 KW using the 272-REC. The recirculation consists of a high flow - low pressure pump, reservoir, and cooling coil with forced air cooling. Both the coil and fan power supply are integrated in the re-circulating box. The hoses are 1/ 4" ID Tygon tubing with the output tubing fibre reinforced to handle high pressure due to the attached equipment.

The 271-REC has a total dissipating power of 99.3W with a large amount of heat exchange occurring at the pump, reservoir, tubes, etc. When cooling a 200 W arc lamp, the total rise in water temperature is only 10oC (see specifications for more details) and power dissipation oc-curs at 4.5 W /oK. This is accomplished by placing the cool-ing coil after the pump to reduce the temperature prior to the output and with a high water flow rate of 300 cc/min.

The 272-REC is an upgraded model capable of cooling 1 KW arc lamp housings. This greater amount of power is handled using two cooling coils. For even higher powers, air heat capacity becomes a factor and custom models can be made with retrofitted fans of higher flow.

Version Model	Version Description	Version Price(USD)
271-REC	Recirculating water cooler, 300 W capacity	,
272-REC	Recirculating water cooler,1.6 kW capacity	

Technical Specifications

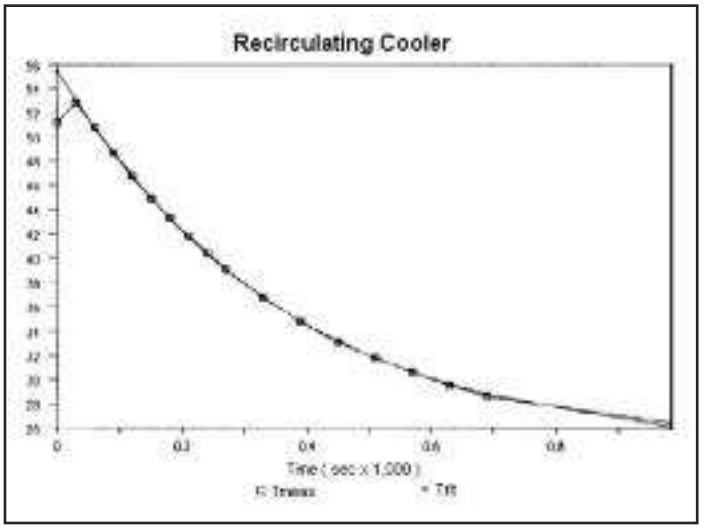
~~**271-REC**~~

Equipment power to be cooled: Up to 300 W
Maximum pump pressure: 10.35 psi
Coolant liquid temperature rise: 0.25 ^{O}C / W
Max. external flow obstruction: 148 ml / min
Recirculating heat capacity: 2200 J / ^{O}C
Self heating temperature rise: 7 ^{O}C
Power: 90-120 or 210-240 V AC, user selectable fused input.
~ 0.2 A at 110 V AC.
Physical dimensions: 4.0 (h) x 4.0 (w) x 12.0 (l) in3
102 (h) x 102 (w) x 305 (l) mm3
Water equivalent volume: 400 cc
Recirculating dissipation: 4.5 W / ^{O}K

For 200 W arc lamp cooling
Total water temperature rise: 10 ^{O}C
Measured water flow: 300 cc/min
Coil dissipated power: 28.7 W
Temperature rate of change: 0.0605 ^{O}K / sec
Total dissipated power: 99.3 W

~~**272-REC**~~

Equipment power to be cooled: Up to 1 KW
Number of coils: 2 coils
Accessories: 270-FS. SPDT flow switch to disable electrical power in critical cooling applications. Factory installed for internal liquid connection, or supplied separately for user installation.



Z-Adjustable Beam Collimators

Z-Adjustable Beam Collimators COL6(/UV)(/AR)**

The Sciencetech COL6 beam collimator family is for use in the small Sciencetech 201-100 (up to 200 W) air cooled housing. The collimator consists of one to three lenses that are focused at the bulb arc, or any other point source, to produce a collimated beam. The lens or lenses are mounted on a sliding tube with a total travel of approximately 20 mm. This arrangement allows the user to optimize the distance of the lenses to the arc for the desired working wavelength, and/or to change the exit beam divergence. To order:

1) Select the beam diameter: a) 64* type condenser. 1.0" diameter lenses. Collimated beam diameter = 23mm. b) 65* type condenser. 1.5" diameter lenses. Collimated beam diameter = 35mm.

2) Select the desired condenser optics. Possible choices are listed in the table below.

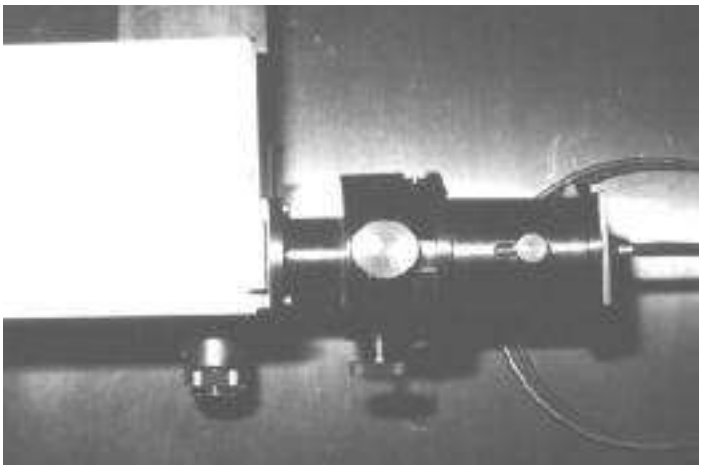
3) Attach a suffix if desired:

- DUV synthetic silica for UV operation down to approximately 190nm (not available in COL603).
- AR single layer MgF2 antireflection coating with thickness optimized for 550nm.

If no suffix is used, condensers 6*1 and 6*2 use fused quartz lenses and option 6*3 uses Pyrex.

Model Number	Aperture Ratio(F/#)	Description
6*1	1.4	Single plano convex spherical lens
6*2	1	Two plano convex spherical lenses (to minimize spherical aberrations)
6*3	0.6	Aspheric system for maximum throughput and minimum spherical aberration
6*4	0.7	Three spherical lens system optimized for spherical aberration. Recommended for very high quality condensing. For example, when it is desired to illuminate a small fibre or a pinhole with a condenser.
Please refer to price list for pricing.		

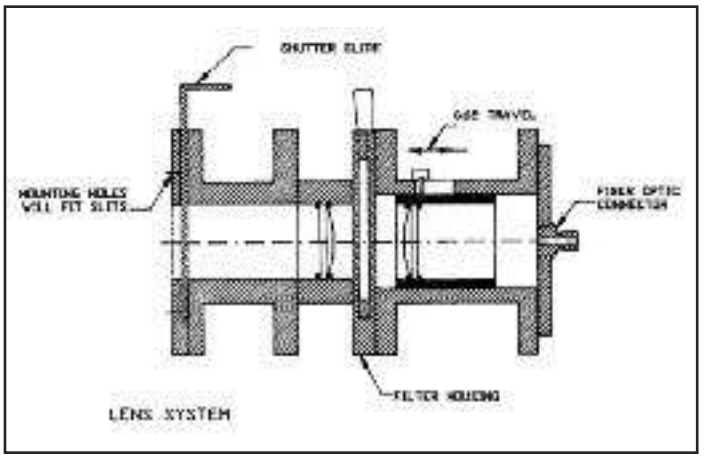
XYZ-Adjustable Lens-Shutter-Filter Assembly



XYZ Optical Coupler with filter drawer and shutter shown attached to monochromator

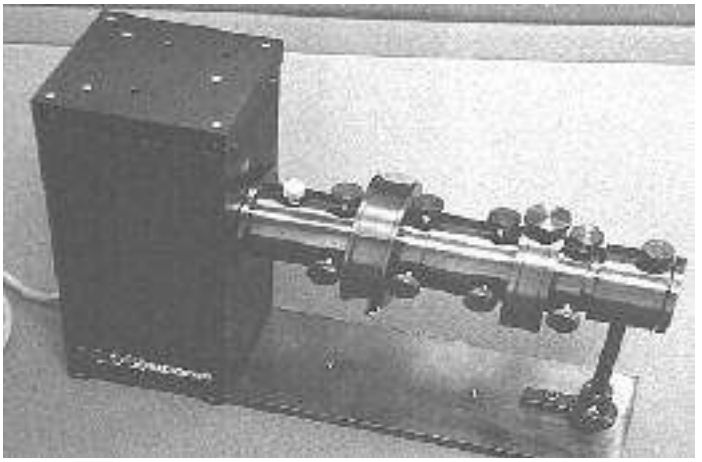
The XYZ-LSF allows XY adjustment of a collimating lens and focus adjustment by Z translation of the condensing lens or lenses. It is specially recommended for accurate focusing on single fibres.

The system includes a mechanical shutter slide and filter holder for 1" diameter filters (circular or square). The XYZLSF includes a COLXY64 collimator, an FH641 filter holder and a COL64 lens holder with Z translation. The standard unit mounts in Sciencetech monochromators. Adapters to mount directly to the Sciencetech model 201-100 air cooled research arc source are available. A fibre optic mounting receptacle can be attached to the unit.



Description	Price(USD)
XYZ adjustable lens-shutter filter assembly as described above. Includes two 1” diameter glass lenses	P.O.R
With fused silica lenses	P.O.R

Pinhole Collimator Assembly



Air cooled housing with collimator, filter drawer, condenser, XY adjustable pinhole, and adjustable collimator

The Sciencetech PIN641/PIN651 pinhole assemblies have different input flanges for use with the 1.0 and 1.5" refractive optics respectively. The assembly consists of a tube holding a pinhole with X-Y adjustment and an achromatic output lens to collimate the output beam. Available pinhole diameters are 1, 2µm ±0.5µm, 5, 8, 10µ ±1µm, 12.5, 15, 25, 35, 50, 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000µm ±5µm.

SPECIFICATIONS

Collimator:	PIN641 / PIN651
Number of elements:	1 achromat
Lens diameter:	1.0" (25.4mm)
Maximum output beam aperture:	23mm (1)
Focal length:	40mm (2)

Notes: 1. The output beam aperture is defined by the numerical aperture of the beam incident on the pinhole multiplied by the achromat focal length, up to the maximum output beam aperture.

2. The standard achromatic lens has a focal length of 40mm, but the assembly can accept optional lenses of 35 or 50mm focal length.

3. Beam divergence is, for pinholes larger than 5-10µm in diameter, equal to the product of the pinhole diameter divided by the lens focal length. For pinholes smaller than 5-10µm in diameter, the beam divergence is increasingly limited by diffraction effects and by achromat aberrations.

Version Model	Version Description	Version Price(USD)
PIN641	Pinhole collimator assembly as described above with 1” optics	P.O.R
PIN651	Pinhole collimator assembly as described above with 1.5” optics	

Sciencetech Beam Condensers

The Sciencetech CON64*/CON65* beam condenser family is for use in the small Sciencetech 201-100 air cooled housing after the COL64*/COL65* beam collimators. The condensers focus a parallel output beam into a point. They consist of one to three lenses in a tube that can be attached to the a collimator of the same corresponding lens diameter.

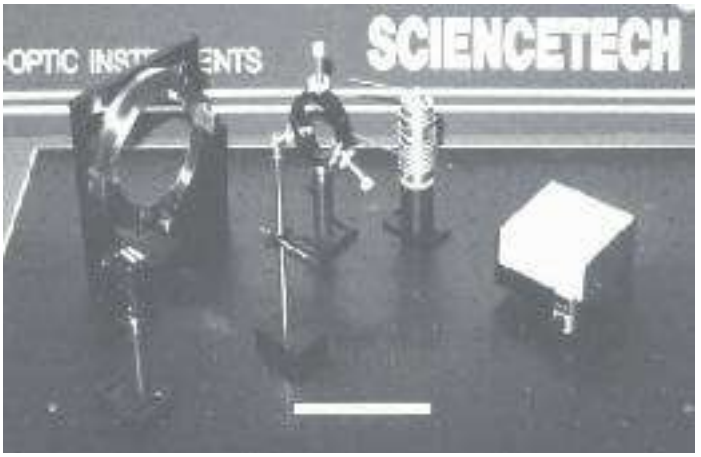
The CON64* condenser has 1.0" diameter optics, CON651 1.5".

SPECIFICATIONS

Condenser:	**CON641**	**CON651**
Number of elements:	1 to 3	1 to 3
Lens diameter:	1.0"(25.4mm)	1.5"(38.1mm)
Input beam aperture:	23mm	35mm
Focal length:	Beam aperture *f/#	Beam aperture *f/#

Model Number	Aperture Ratio (F/#)	Description
6 * 1	1.4	Single plano convex spherical lens
6 * 2	1	Two plano convex spherical lenses (minimize spherical aberrations)
6 * 3	0.6	Aspheric system for maximum throughput and minimum spherical aberration
6 * 4	0.7	Three spherical lens system optimized for spherical aberration. Recommended for very high quality condensing. For example, when it is desired to illuminate a small fiber or a pinhole with a condenser.
6 * 5	0.7	Two spherical lens system optimized for spherical aberration. One of the lenses is an achromat, to minimize chromatic aberration and thus the need for focus adjustment as a function of the wavelength.
Please refer to price list for pricing.		

Breadboard Optical Tables



Sciencetech Model 2200 Breadboard Optical Table

For use in research or prototype development, the Sciencetech 2100/2200 breadboard optical tables are a terrific value in a low cost, lightweight and versatile unit. With a working surface of 24 x 36 inches, many optical elements may be mounted anywhere on the plate using available clamps. The unit easily fits on your laboratory bench top. The small size of the table size makes it a convenient and versatile component for your prototype systems.

The black anodized top provides a tough surface to mount your components while offering protection to the aluminum base and reducing reflections from the table. Holes are drilled size 1/4 - 20 and are available with 1 or 2 inch centers. The plate is supported by a mild steel frame constructed for minimum deflection over the length of the table. Thumb screws and clamps for use with these tables are available. All these components and the breadboard table are compatible with Newport bases, screws and clamps.

These tables are available in several sizes:
24 x 36", 18 x 22", 12 x 18"

DIMENSIONS

Working surface:	24 x 36 inches
Surface material:	1/4 inch thick aluminum plate, Black anodized
Support structure:	Mild steel frame
Holes:	1/4 - 20: 1" centers (model 2100) 2" centers (model 2200)
Height:	3 inches (± 0.25" adjustment)
Weight:	42 pounds

Version Model	Version Description	Version Price(USD)
2100	24 x 36”, 1” centers	P.O.R
2200	24 x 36”, 2” centers	P.O.R
4080	12 x 18”, 2” centers, M6 holes	P.O.R
4090	18 x 22”, 25 mm centers, M6 holes	P.O.R

Sciencetech Imaging Optics

The Sciencetech IO64/IO65 imaging optics family allows the projection (imaging) of an object (lamp arc, monochromator slit, fibre end, etc.) They consist of two to four lenses mounted in a sliding tube with a total travel of approximately 20mm. This arrangement allows the user to optimize the distance of the lenses to the object for the desired working wavelength, and thus the system magnification. The lenses have short spaces between them to allow the imaging of large objects with minimum vignetting. The optics are used for two main applications:

1. Remote (non-contact) illumination.
2. Optical transformation: by using a magnification different from 1:1, the optics permits to match the numerical aperture (f/#) of the two systems interconnected by the lenses.

SPECIFICATIONS

Condenser:	IO64	IO65
Number of elements:	One to three	One to three
Lens diameter:	1.0"(25.4mm) 1.5"(38.1mm)	
Input beam aperture:	23mm	35mm
Focal length:	Beam aperture*f/#	Beam aperture*f/#

Note: Model 6*4 UV cut off at approximately 360nm.

Model IO64*: High throughput optical condenser with aperture corresponding to f/0.7. Computer optimized aspheric/PCX system for VIS/NIR applications. 1" optics.

Model Number	Aperture Ratio (f/#)	Description
6 * 1	1.4	Single plano convex spherical lens
6 * 2	1	1 plano convex spherical lenses (minimize spherical aberrations)
6 * 3	0.6	2 aspheric lenses for maximum throughput and minimum spherical aberration
6 * 4	1.5	2 achromatic lenses. This system minimizes chromatic and spherical aberrations and thus eliminates the need for focus adjustment as a function of wavelength. Recommended for very high quality condensing with relatively low N.A. (high f/#). ex. illumination of a small fibre or a pinhole.

Please refer to price list for pricing.

Variable Frequency Chopper

Sciencetech Model C130 with controller and blades

The Sciencetech C130 variable frequency chopper has been specifically designed for very high stability and frequency control. When used with a lock-in amplifier, it allows the filtering out of large background signals of constant frequency and the recovery of very low level signals.

The optical chopper blades are rotated using a DC motor controlled by a tachometer feedback circuit. The frequency can be set by using the coarse and fine potentiometers located on the front panel of the controller. An LCD display reads the chopper frequency.

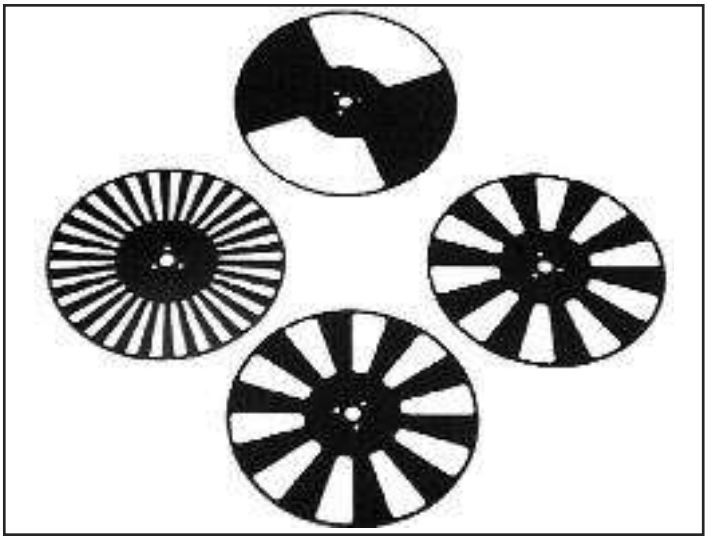
A true synchronization output, generated with an optical sensor which monitors the chopper blade, can be fed to a lock-in amplifier.

The controller unit houses the drive electronics and the display. It is connected to the chopper motor assembly by a 6 foot cable. The motor speed is adjustable from 6 to 93 revolutions per second and supplies a 5V reference output (BNC connector) to a lock-in amplifier.

Standard chopper blades have 2, 4, 5, 10 and 30 apertures. We can also supply special reflective and polarizing blades.

Technical Specifications

Chopper Motor Type: DC motor with tachometer feedback
Frequency Display: 4 digit LCD
Accuracy of frequency setting: Better than 0.1 %
Motor Speed: 5 to 90 rev/sec
Front Panel Control: Coarse and fine adjustment
Blade Diameter: 100 mm
Standard Apertures: 2, 4, 5, 10, 30
Control Enclosure Size: 152.4 x 167.6 x 144.8 mm
Blade Holder Size: Base: 57.2 x 57.2 mm with slots for optical table mounting Unit without blades: 95.3 (h) mm (center of rotation at 76.2mm)



Optional C130 chopper blades

Options

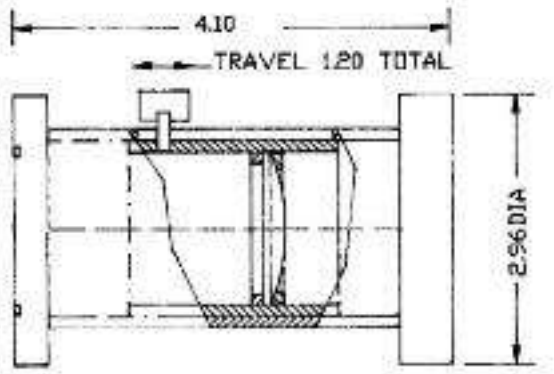
Speciality Blades: Polarizing; Wavelength: 10 to 2000 µm, Reflecting Blade, Blade Enclosures, Other diameters and apertures.

Version Model	Version Description	Version Price(USD)
C130	Variable speed optical chopper	P.O.R
C130X	Computer-controlled optical chopper including controller, RS232 cable, software	P.O.R
CB-2	2 aperture blade	
CB-4	4 aperture blade	
CB-10	10 aperture blade	
CB-30	30 aperture blade	
Cooling Options for C130X		
	Thermal contact mount, chopper-mounted mount with good thermal contact. User supplies plate for heat transport of mount to palate. Requires dissipation of 0.5 to 2 W, depending on speed	P.O.R
	Water cooling - water cooling coil for motor, Swangelok flanges and feed through	P.O.R

Adjustable Lens Tube

Lens Tube
945002,3,16,24

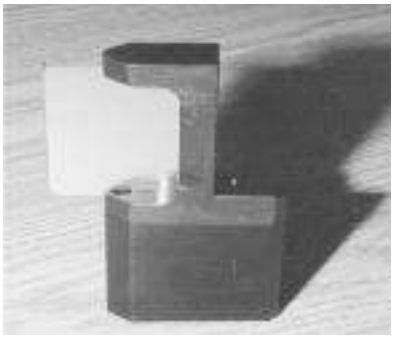
Adjustable lens tube with 1” diameter optics. Includes 2 glass lenses.



Adjustable Lens Tube Specifications

Mirror Holder

Mirror holder for flat mirrors



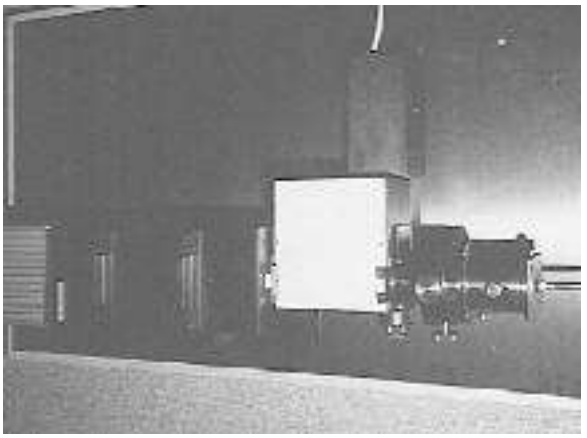
Mirror holder for flat mirrors, consists of mirror base C916077 and mirror mount C9166078. Included in 9010/55 monochromator with side ports.

Mirror Holder for Spherical Mirrors

Mirror holder for spherical mirrors, consists of mirror base A916014 and mount B916015. Three point adjustable.

Miscellaneous Accessories

Component Mounting Table



Customized for integrated modular systems. Price depends on size of table. Standard is (48x34)

Version Model	Version Description	Version Price(USD)
LT1	Adjustable Lens Tube	P.O.R
MLF1	Mirror holder for flat mirrors	P.O.R
MLS1	Mirror holder for spherical mirrors	
Mnt.Tbl.	Component Mounting Table	P.O.R

Filters for spectroscopic applications

Longpass Filters are excellent tools for order sorting and light attenuation. They transmit a wide spectral band of long wavelength radiation while blocking short wavelength radiation. Sciencetech offers these filters for the intended use of second-order elimination.

All Sciencetech monochromators work with the first order of diffraction. In many cases some filtering is needed to eliminate unwanted second order components. For example: a monochromator scanning from 250 to 800 nm with a light source that emits from 250 nm above, no filtering is required from 250 to just below 500 nm. For wavelengths from 500 to 800 nm, one high-pass filter is needed to suppress emissions from 250 to 400nm respectively. It is also a good idea to use a filter with a cutoff just below 250nm for the range of 250 to 500nm, to eliminate any light emitted from the lamp before that range.

Choose a filter that starts transmitting just below the wavelength range of interest. Standard second order elimination filters are absorbing glass with negligible transmittance for all wavelengths shorter than 90% of the cut-on. Besides second order blocking, longpass filters can be used for other applications requiring transmission above a certain edge wavelength.

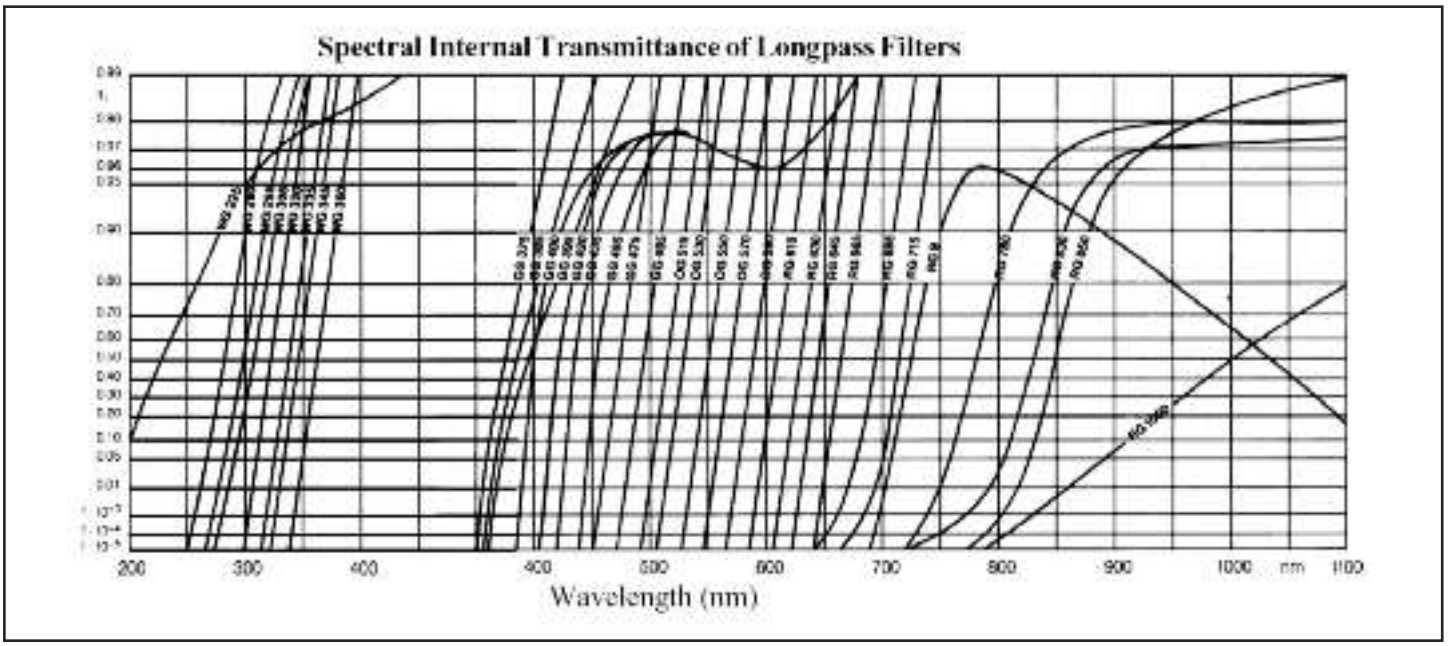
Safety Note: these Longpass Filters attenuate by absorption. If a small, high-powered beam is used, extreme localized heating of the filter may result and rupture is likely. Some general recommendations for safe operation of the filters:

• do not exceed a 5o C/ min temp rise.
• spread beam over filter .
• use a filter holder which minimizes thermal and mechanical stress.

Reference Number	Transmission Range (50%)	Price (USD) 1" Diameter	Price (USD) 2" square
LP-WG225	225-2700	P.O.R	P.O.R
LP-WG295	295-2700		$
LP-WG305	305-2700	$	$
LP-WG320	320-2700	$	$
LP-GG395	395-2750	$	$
LP-GG400	400-2750	$	$
LP-GG435	435-2750	$	$
LP-GG455	455-2750	$	$
LP-GG475	475-2750	$	$
LP-GG495	495-2750	$	$
LP-OG515	515-2750	$	$
LP-OG530	530-2750	$	$
LP-OG550	550-2750	$	$
LP-OG570	570-2750	$	$
LP-OG590	590-2750	$	$
LP-RG610	610-2750	$	$
LP-RG630	630-2750	$	$
LP-RG665	665-2750	$	$
LP-RG695	695-2750	$	$
LP-RG715	715-2750	$	$
LP-RG780	780-2750	$	$
LP-RG830	830-2750	$	$
LP-RG850	850-2750	$	$

Filters are available in 25.4 mm (1") diameter, 25.4 mm (1") square and 50.8 mm (2") square.

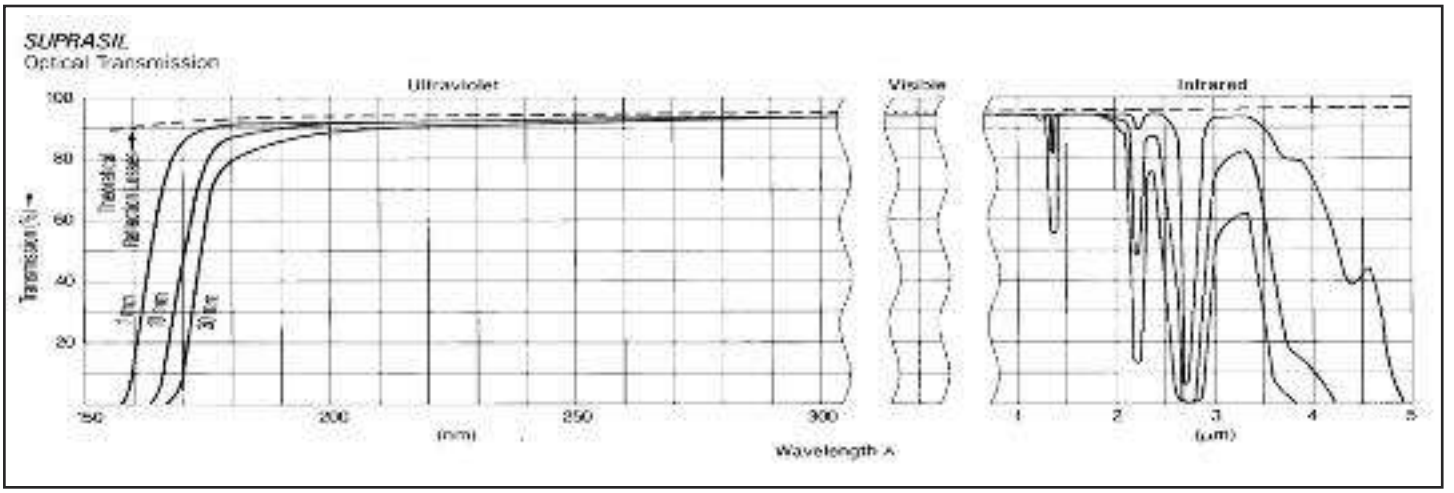
Filter holders can be found on page 6-16
Filter wheels can be found on page 6-19



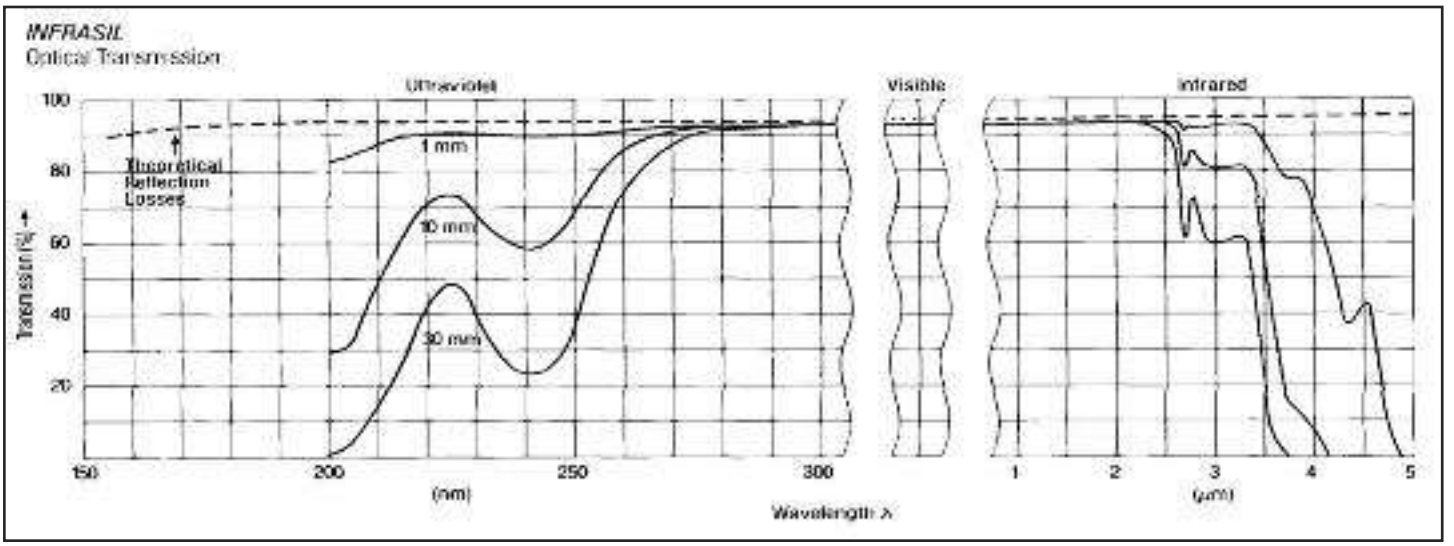
High Pass Filters

Optical Transmission Curves

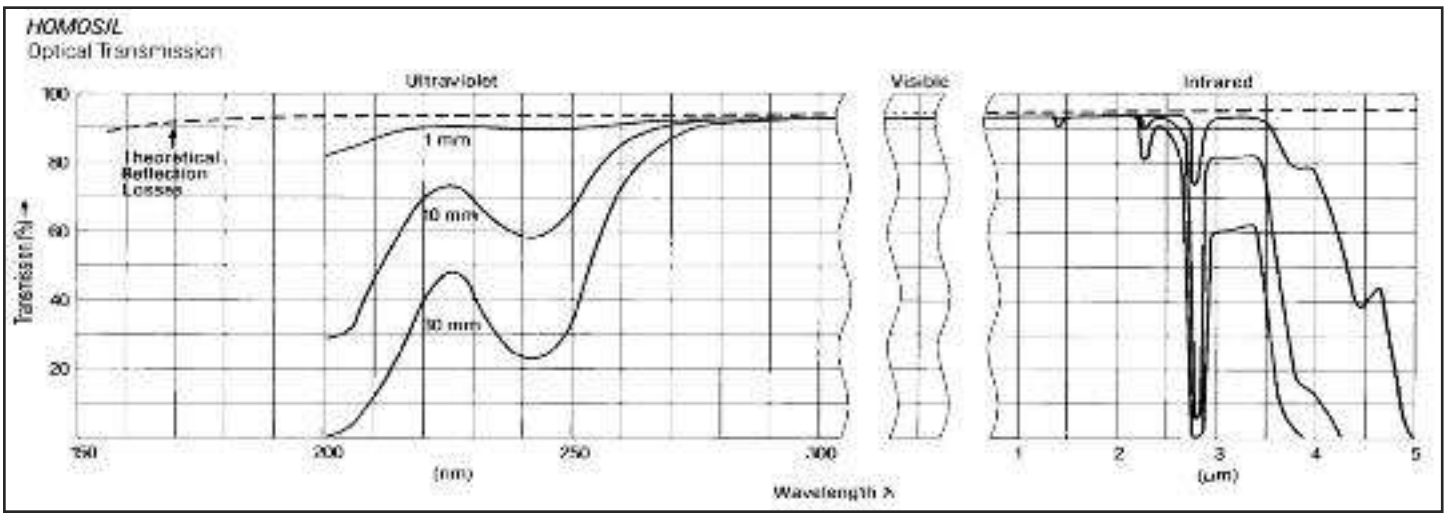
Ultraviolet-grade fused silica



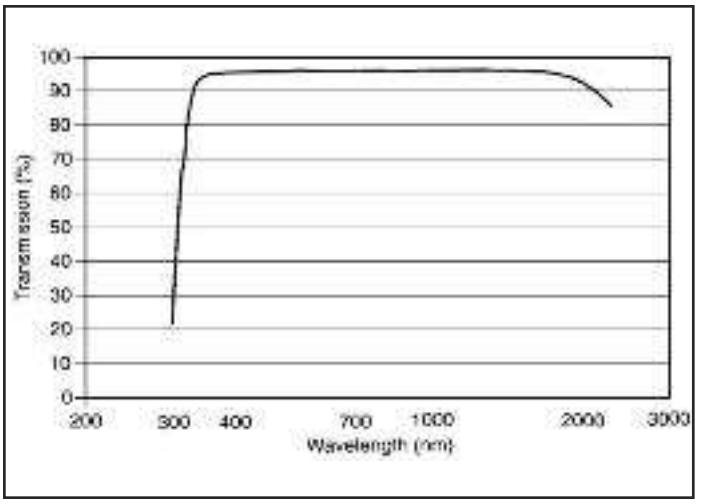
Infrared-grade fused silica



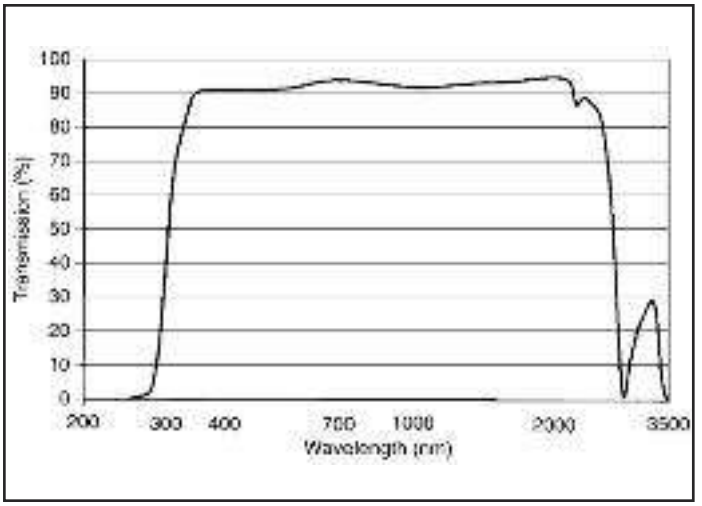
Standard quartz



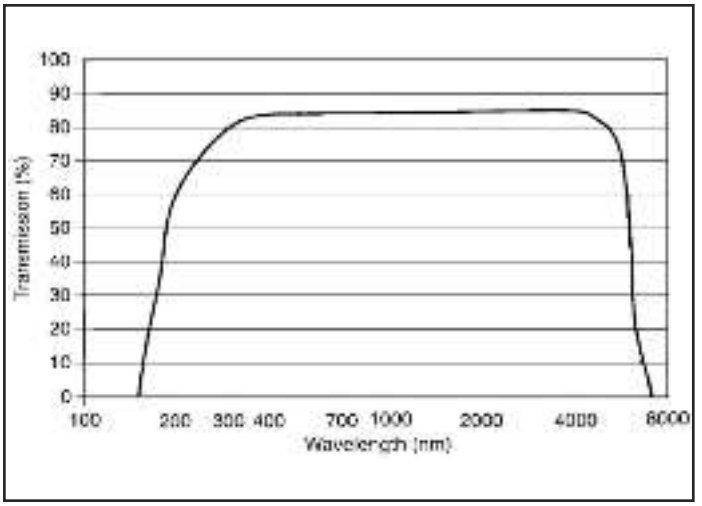
BK7



PYREX



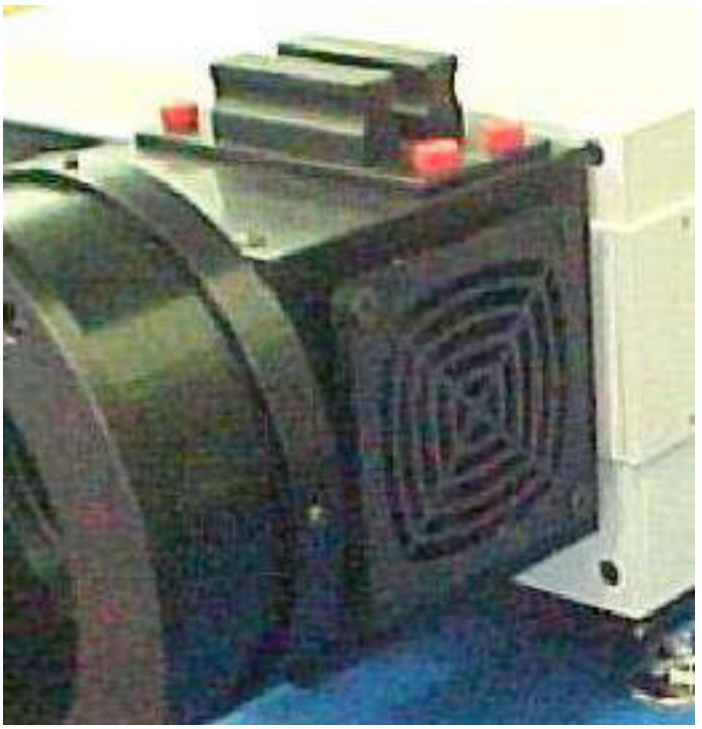
SAPPHIRE



High Pass Filters

Indices of Refraction			
Wavelength	Fused Quartz / Silica	BK7	Sapphire
213.86	1.53427		
230.21	1.52005		
239.94	1.51337		
265.20	1.5		1.8336
280.35	1.49403		1.82427
302.15	1.48719		1.81351
334.15	1.47976		1.80184
346.62	1.47746		1.79815
365.02	1.47452	1.53626	1.79358
404.66	1.46962	1.53024	1.78582
435.84	1.46669	1.52669	1.7812
546.077	1.46008	1.51 872	1.7078
706.52	1.45516	1.51289	1.76303
852.11	1.45247	1.50981	1.75885
1013.98	1.45025	1.50731	1.75547
1529.52	1.44427	1.50094	1.7466
1970.09	1.43853	1.495	1.73833
2325.42	1.43293	1.48929	1.73055
3243.90	1.41315		1.70437
3507.00	1.40566		1.69504
4954.00			1.62665
5577.00			1.58638

Filter Box Holder - Air-Cooled



Highlights

- Accepts up to two 1" or 2" filters in series (round or square, but must specify)
- Includes two Removable Filter Slides (2" or 1" diameter round)
- Filters are removable by unscrewing the slide holder from the top
- Filters are air cooled by a fan providing cross wind
- Fan powerful enough to keep an extended hot mirror cooled while reflecting IR light from a 1KW Xenon arc lamp source

Available Input Extension Coupling Tube for mating to a Sciencetech Model 200-1K arc lamp housing

This filter box holder accepts up to two filters in series, and is air cooled by fan. Each filter is mounted on a removable slide that is screwed into the filter holder box. The filters can be individually removed by unscrewing the slide from the top of the filter box holder. The air-cooled filter box holder and slides accept both 1" and 2" filters, sold separately. Additional coupling optics may be required to secure the filter holder onto the input of a monochromator/spectrograph, or output of a light source. For example, coupling to a 200-1K arc lamp housing requires an additional input extension coupling tube which is sold separately (as shown in the picture with the square FH-AC air-cooled filter box holder). Experience has shown that the air-cooled fan is powerful enough to even keep an extended spectral range hot mirror from cracking under the intense heat of a 1kW Xenon arc lamp source (i.e. 200-1K Arc Lamp Housing) mated directly to it. The hot mirror inside the filter box holder, which is mounted onto the removable slide, would reflect back the IR light at 0 degrees (no tilting) back into the arc lamp housing source rather than dumping it onto a heat dump. Under this configuration, the hot mirror would not break even if operated for days at a time.

Fan Power

The air-cooled fan is an 115VAC fan that plugs directly into the wall electrical outlet.

Round or Square Filters

The filters are mounted onto removable slides that can be unscrewed from the top of the filter box holder. The standard slide accepts round 2" or 1" diameter filters, but square filter slides are available. User must specify the square filter slides.

Mating to Light Sources

The air-cooled Model FH-AC filter box holder can mate directly to a 201-1K or 201-100 arc lamp housing or TH3 QTH lamp housing through 2" or 1" diameter Thorlab coupling tubes. It can also be mated to a 200-1K arc lamp housing through a special input extension coupling tube as shown in the pictures.

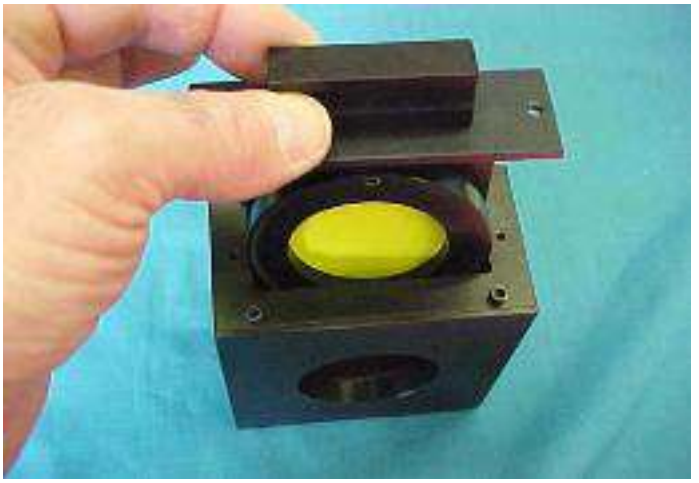
Mating to Monochromators/Spectrographs and Sample Chambers

The air cooled Model FH-AC filter box holder can mate to a monochromator/spectrograph or a sample chamber via 1" or 2" diameter Thorlab coupling tubes or Sciencetech CON1/2L or CON2/2L condensing lens assemblies. If the filter box holder is also mated to a 200-1K arc lamp housing at the input, the input extension coupling tube would be long enough such that the filter box holder could be directly mounted to the input port of the monochromator as shown in the picture.

Air Cooling Capability

This air-cooled filter holder was originally designed to filter extended range IR light from a 1KW Xenon arc lamp light source before it enters a monochromator. A 0 degree extended spectral range hot mirror was used, such that the IR light would be reflected back into the light source. The air cool fan was powerful enough to prevent the hot mirror from cracking even after days of continuous use.

Version Description	Version Code	Version Price (USD)
with two 1 inch filter slide mounts	2x1inch	P.O.R
with two 2 inch filter slide mounts	2x2inch	P.O.R



Filter Removable Slide

Mounting Holes

When purchased separately and not part of a system, the Filter Holder does not have any pre-drilled mounting holes for mounting to Sciencetech products such as the CON1/2L or CON2/2L condensing lens assemblies. The reason is that these holes would make the holder non-light tight should it be used with other systems. If the Air-Cooled Filter Box Holder is to be mated to a Sciencetech product, please specify which product at the time of order for the pre-drilled mounting holes to be added.

Hot Mirrors

The Model FH Filter Holder can be used with 25mm or 50mm square or round hot mirror.

Accessories

Additional Removable Filter Slides (FH-M)

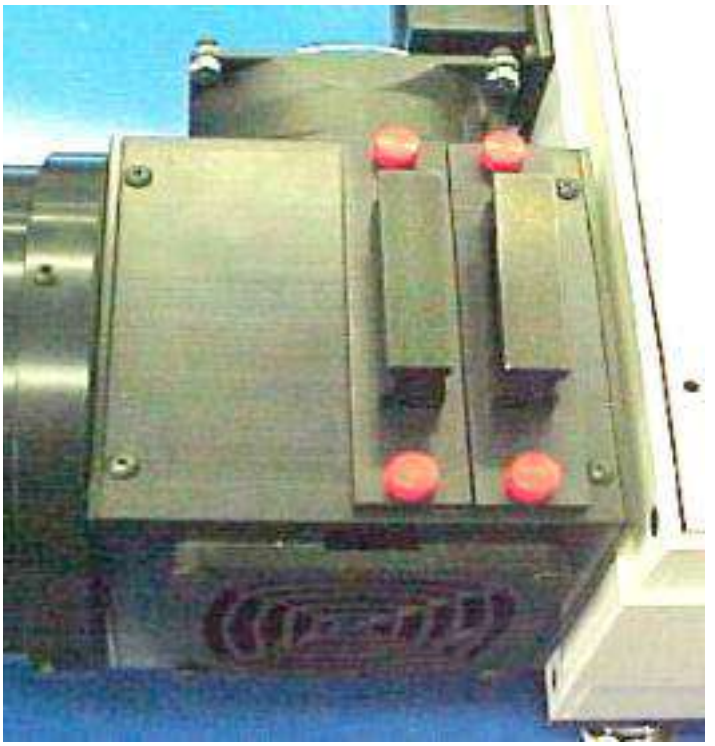
Additional removable filter slides are available for the Sciencetech Model FH Filter Box Holder and Sciencetech Model FH-AC Air-Cooled Filter Box Holder. These additional removable filter slides allow users to pre-mount various 1" or 2" filters so that they can easily be exchanged into the filter holder box without the need to mount and demount each filter element from the single slide. There is a filter slide version for both square and round filters, although the picture only shows the round version.

Square Filter Slide Option (FH-MSQ)

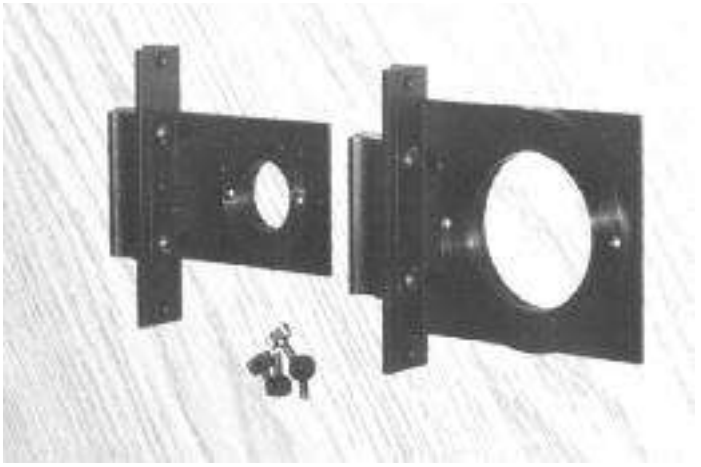
The standard removable slide accepts only round filters. With this upgrade option, the removable slide is made to hold square filters instead. This is an administrative fee, hence it applies only once whether one, two, or more square filter slides are ordered. Please note the delivery time for square slides is considerably longer than that for round slides as they are not stocked items.

Input Extension Coupling Tube (200-1K-IECT)

This coupling tube connects the Model 200-1K arc lamp housing to the Model FH-AC air cooled dual filter holder box. Its length is designed specifically to place the air cooled filter box holder with 2" diameter filters in the converging beam of the light source. A mating flange connects this input extension coupling tube with the Model 200-1K arc lamp housing.



Filter Holders



1” and 2” filter holders

The Sciencetech FH641 and FH651 filter holders provide a mechanically stable way to mount filters in the optical path. They consist of a filter housing with mechanical coupling to the COL64/CON64 and COL65/CON65 collimator/condenser families respectively. A plunger at the bottom of the holder allows for easy extraction of the filter. A sliding cover minimizes the entrance of room light and allows the use of the filter holder in fluorescence work. Locating the filter(s) in the collimated part of the beam (from the sample to the detector) has two advantages:

1. The signal background produced by filter autofluorescence is minimized because the filter is out of focus with respect to the sample and detector.

2. Interference filters can be used without correction due to incidence angle changes in a diverging or converging beam. FH641 permits 1" diameter or square filters with a total filter depth of 3/8"; FH651 permits 2" diameter or square filters with a total filter depth of 3/8". Sciencetech FH722 holders hold two filters, permitting 2” square filters between 0.5 and 6.5 mm thick.

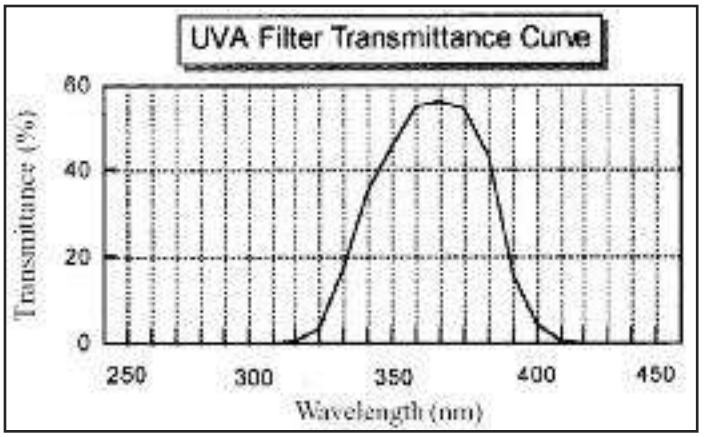
Version Model	Version Description	Version Price (USD)
FH641	Filter holder for 1” diameter and square filters	
FH651	Filter holder for 2” diameter and square filters	
FH722	Filter holder for 2” square filters, holds 2 filters	P.O.R

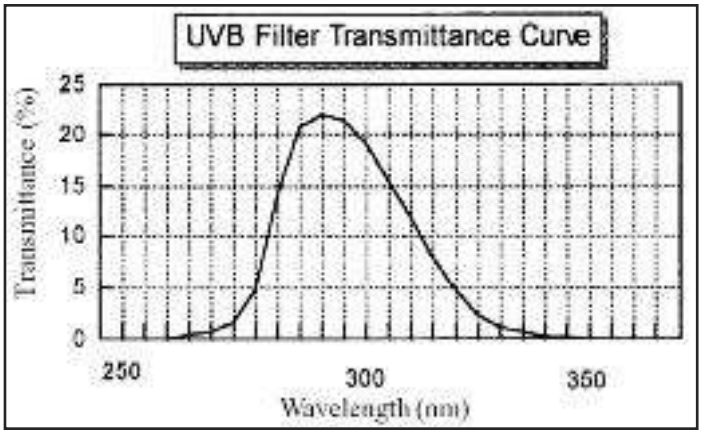
Filters for Detection Systems

Ultraviolet Interference filters

UV Interference filters isolate a narrow UV spectral region while blocking out-of-band wavelengths from low UV to far IR. Sciencetech offers specially designed broad-band interference filters for UVA-UVB-UVC selection which are hermetically sealed and mounted in rings for maximum resistance to humidity. These filters are also blocked from the UV to 2.5 µm wavelengths with OD4 (10-4) for high unwanted wavelengths rejection. Sciencetech offers 1” diameter and 50 mm square sizes.

	Peak Transmittance	Centre Wavelength	Full Width at Half Max
UVA	50%	360nm	50 nm
UVB	25%	300nm	30 nm
UVC	25%	250nm	30 nm





	Description	Price (USD)
UVA UVB Filters	1“ with frame	
	3“ with frame	

Notch Filters for Raman Applications

Standard lines for red/near infrared wavelengths: 633, 647, 752, and 785 nm. Spectral bandwidth for 647 nm filter is 29 nm between O.D. 0.3 or 50% points.

UVA UVB UVC Filters	Description	Price (USD)
	1” diameter notch filter	P.O.R

Flat Response Filter

This special filter is tailored to give a flat response from 450 to 950 nm when combined with a Silicon semiconductor detector. It is available in 12.5 mm diameter and 25 mm diameter sizes. The filter is mounted in a ring. After mounting clear apertures are 10.5 mm and 23 mm respectively.

Flat Response Filter	Description	Price (USD)
	25mm diameter	P.O.R

Neutral Density Filters

Neutral density filters are used primarily for the attenuation of light over a wide spectral range. They supply flat attenuation from 400 to 1100 m. Neutral density filters are useful for attenuating the signal reaching a detector to avoid saturation, damage, and/or inaccurate results caused by excessive power. The filters are available in 1” diameter and 2” square.

Optical Densities	Transmission (%)
0.1	79
0.3	50
0.5	32
1.0	10
1.3	5
1.5	3.2
2.0	1
3.0	0.1
4.0	0.01

Neutral Density Filters Glass	Description	Price (USD)
	50 x 50mm square	
	3" x 3" square	

Filters for Light Sources

Dichroic filters

I. UV-reflecting dichroic mirror for visible/infrared elimination. These mirrors efficiently reflect ultraviolet and transmit visible and infrared light. They are generally mounted at 45 °. These filters are used in “solar blind” illumination systems or UV solar simulators.

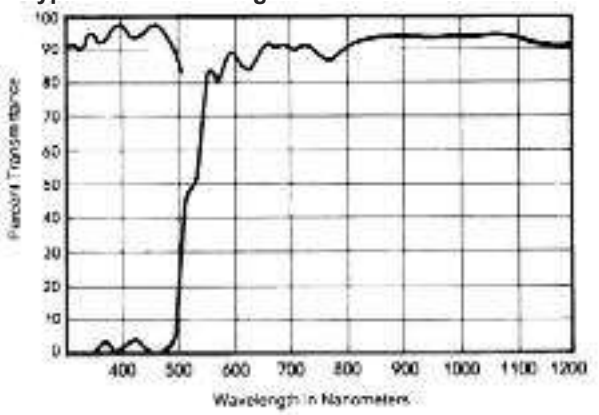
II. Heat Reflecting Filter (hot dichroic mirror). These reflect infrared and transmit visible light. In lamp systems they allow only visible radiation to reach the detectors or fibre optics, thus avoiding damage due to excessive power.

III. Heat-Transmitting Filter (cold dichroic mirror). These mirrors efficiently reflect ultraviolet and transmit infrared wavelengths. They are generally mounted at 45 °.

The standard size for all dichroic mirrors is 2” square. Other sizes are available.

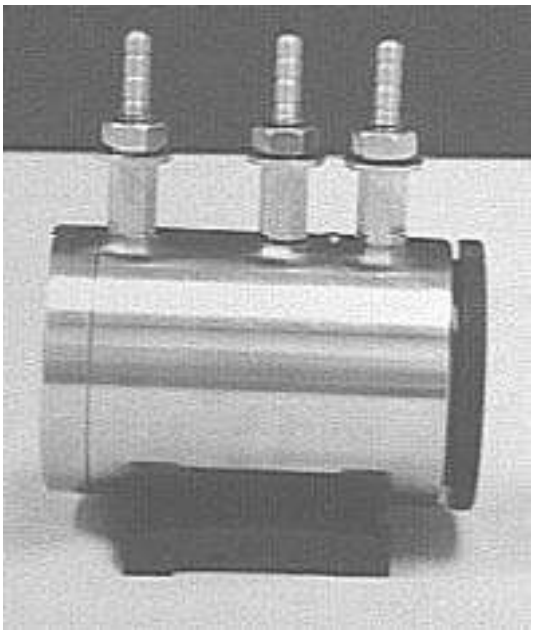
Filter Transmittance and Reflectance			
	UV - Reflecting	Heat Reflecting (hot)	Heat Transmitting (cold)
Average Transmittance	85%	85%	85%
Transmittance Range	600-1200	400-600	750-1200
Average Reflectance	90%	90%	90%
Reflectance Range	325 - 475	700-2000	420-630

Typical UV Reflecting Filter Transmittance Curve



Dichroic Filters	Description	Price (USD)
	UV-reflecting	P.O.R
	Hot Mirror	
	Cold Mirror	

Infrared- Absorbing Water Filters



IR-absorbing water filters are a valuable tool as they protect other filters and optical components from IR damage while still transmitting 200 to 950 nm. Liquid filters are useful for removing infrared light from 1000 to 3000 nm. All models have a recirculated water jacket to cool the filter itself, excellent for high power applications.

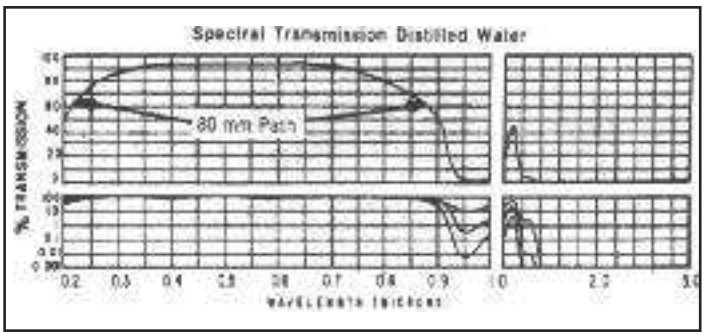
Sciencetech offers IR filters in both aluminum and stainless steel models. Aluminum filters are used in experiments where only distilled water is used. Stainless steel filters are used when the absorbing media is water, copper sulfate, or nickel sulfate.

Dimensions	2" Diameter	3" Diameter
Lenght	92.00 mm	93.98 mm (without mounts)
Outside Diameter	60.00 mm	101.60 mm
Inside Diameter	45.00 mm	68.58 mm

IR-Absorbing Water Filters can be supplied with Glass Windows or Fused Silica Windows.

IR-Absorbing Water Filters

Model	Description	Price (USD)	
		Glass Windows	Fused Silica Windows
01-8711/ 1	Stainless Steel IR Filter, 2" Diameter	1,177	1,374
01-8711/ 2	Aluminum IR Filter, 2" Diameter	824	1,020
01-8712/ 1	Stainless Steel IR Filter, 3" Diameter	1,444	1,640
01-8712/ 2	Aluminum IR Filter, 3" Diameter	1,089	1,181



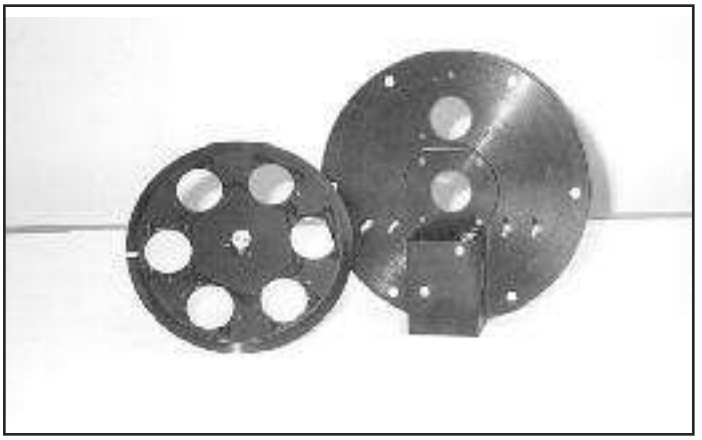
Interference Filters

Interference filters pass a very narrow spectral band of visible or near infrared radiation and reject out-of-band wavelengths from low UV to far IR. Bandpass is 10 nm. Interference filters are 1” in diameter.

Filter holders are located on page 6-16.
Filter wheels are located on page 6-21.

Centre Wavelength (nm)	Minimum Peak-Transmission (%)	Price (USD)
254	17	P.O.R
280	17	P.O.R
308	17	P.O.R
334	25	
340	25	
365	25	
400	30	
405	30	
410	30	
420	40	
430	40	
450	45	
480	45	
500	45	
510	45	
550	45	
580	45	
600	45	
610	45	
632	45	
640	45	
650	50	
690	50	
694	50	
730	50	
766	50	
780	50	
800	50	
830	50	
855	50	
880	50	
905	50	
940	50	
1000	50	
1050	50	
1064	50	

Sciencetech Filter Wheels



Sciencetech standard filter wheels can hold six, eight or twelve 1” round or square filters up to 5 mm thick. One position is usually supplied with a dark cover for zero referencing. Filters are easy to position and replace. All filter wheels come with a light tight housing. Both manual and motorized models are available.

Sciencetech filter wheels can be used as stand alone units or as an accessory to monochromators. When used with narrow band interference filters, filter wheels can serve as low cost, high throughput monochromators. Filter wheels are also necessary for broad band scanning monochromators. High pass filters can eliminate wavelengths not at the nominal wavelength in diffraction grating monochromators.

Manual Filter Wheels

Sciencetech FW-6 manual filter wheels carry six filters 1” in diameter or 1” square with 0 to 5 mm thickness.

Motorized Filter Wheels

Sciencetech motorized filter wheel units include an internal, compact “pancake” stepping motor for minimal space constraints as well as a microprocessor controller for RS232 communication with host computer. Two types of controllers are available: the controller board (usually optional with the Sciencetech 9056 monochromator) and the encased board. Sciencetech FWG-6 holds six filters, 1” in diameter or 1” square, 0 to 5 mm thick.

Sciencetech also offers the FWG-6/OM, a model similar to the FWG-6 containing an external NEMA 17 motor. This configuration decreases switching time due to higher torque. Switching time between adjacent filters is 200 ms.

An eight filter wheel and a twelve filter wheel holding 1”diameter or 1” square filters are also available in both manual and motorized models.

A sixteen filter wheel, holding only 2” filters , is available in a motorized model only.

Technical Specifications

FW-6
Allowable filter size: 1” dia. or 1” square, to 5 mm thick

Operation: manual control
(also available in eight and twelve filter options)

FWG-6
Allowable filter size: 1” dia. or 1” square, to 5 mm thick

Operation: Motorized, computer control

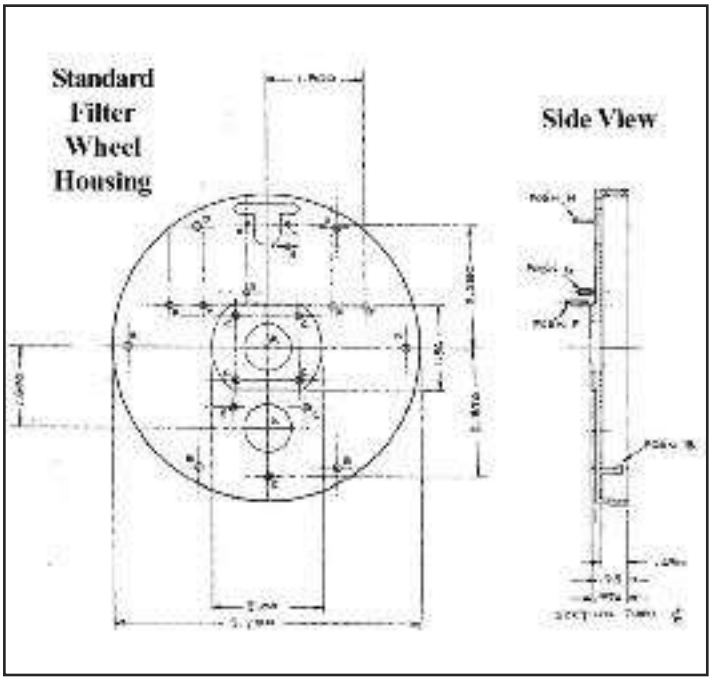
Motor: 12V, 90W per winding, 48 steps per revolution stepper
Controller: Microprocessor based, two 8-bit stepper motor controller ICs
Communication: RS232, standard cable (not null)

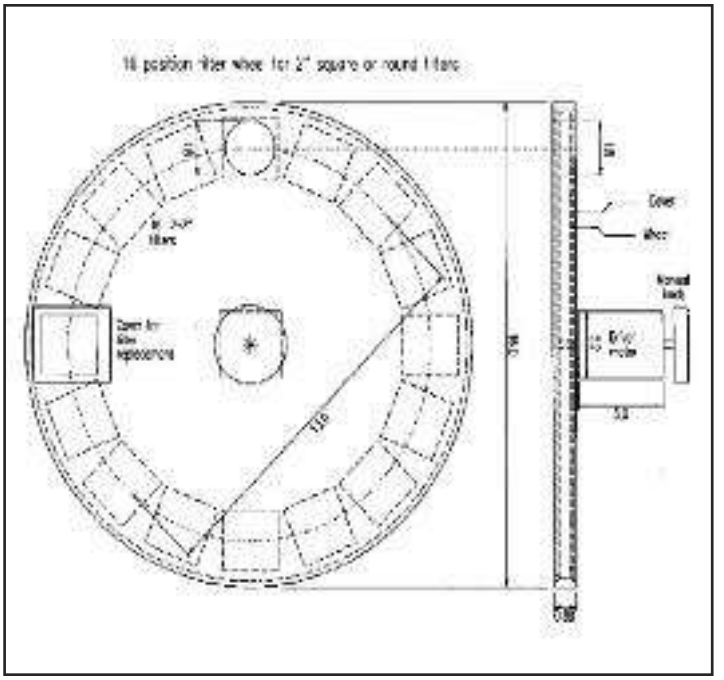
Adjacent filter switch time: less than 400 ms
(also available in eight, twelve, and sixteen filter options)
(note: 16 filter wheel option holds 2” filters only)

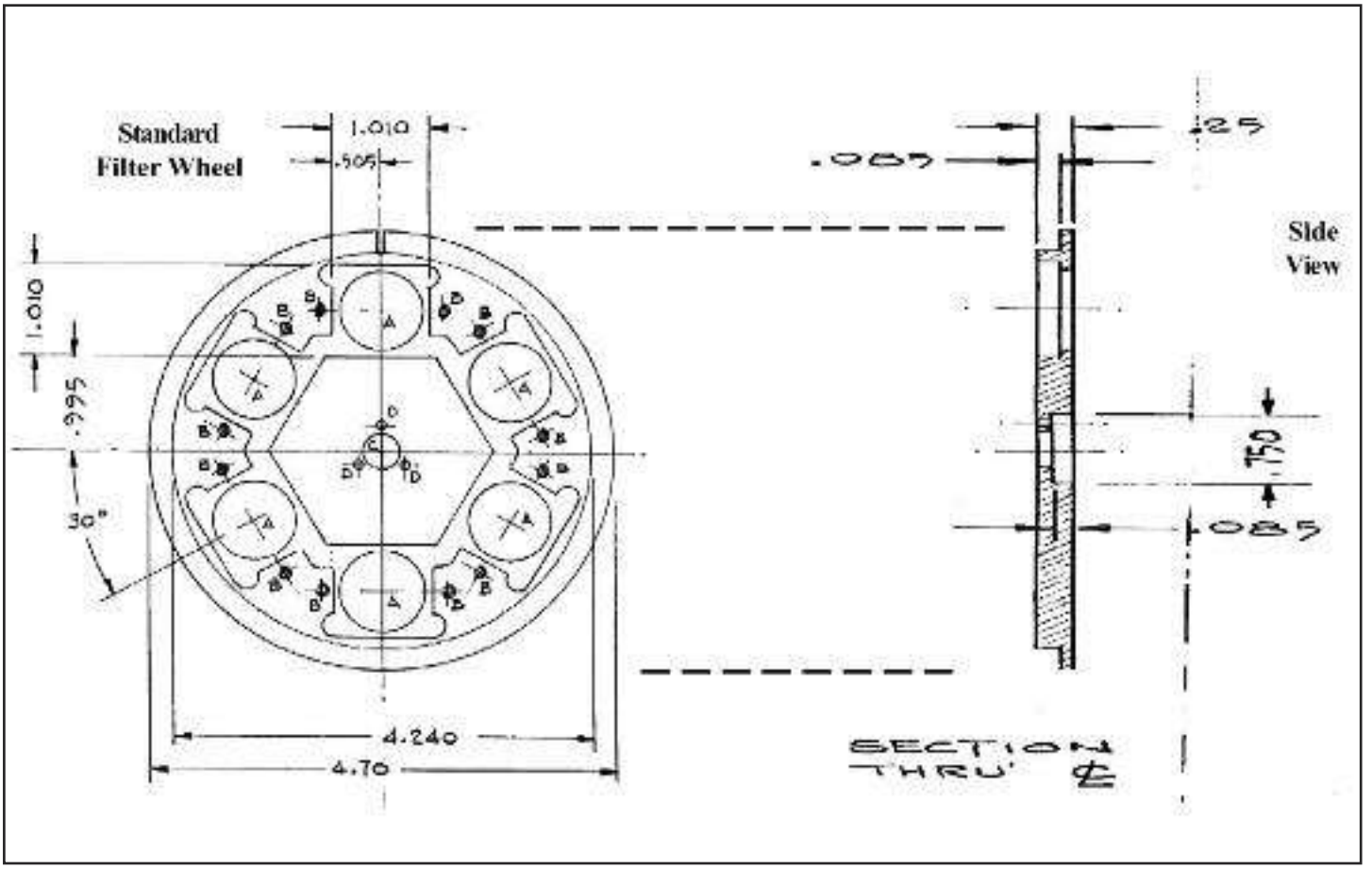
FWG-6/OM
External motor: NEMA 17 stepper, 200 steps/rev

Adjacent filter switch time: less than 200 ms

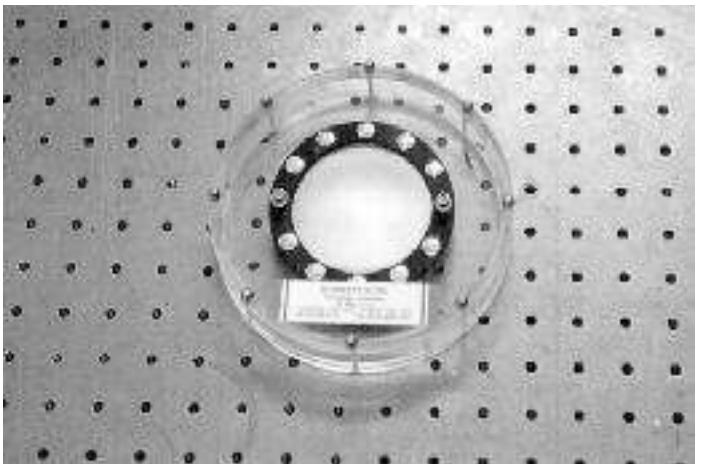
Model	Description	Price (USD)
FWF-6	Manual filter wheel, 6 filter positions	
FW-8	Manual filter wheel, 8 filter positions	
FW-12	Manual filter wheel, 12 filter positions	
FWG-6	Motorized filter wheel, 6 filter positions	
FWG-8	Motorized filter wheel, 8 filter positions	
FWG-12	Motorized filter wheel, 12 filter positions	
FWG-16	Motorized filter wheel, 16 filter positions (2” filters only)	
FWG-6/OM	Motorized filter wheel, external NEMA17 motor	P.O.R


Standard
Filter
Wheel
Housing
Side View




Standard
Filter Wheel
1.010
.505
1.010
.995
30°
4.240
4.70
.025
.085
.750
.085
Side
View
SECTION
THRU' ℄

Infrared Grid Polarizers

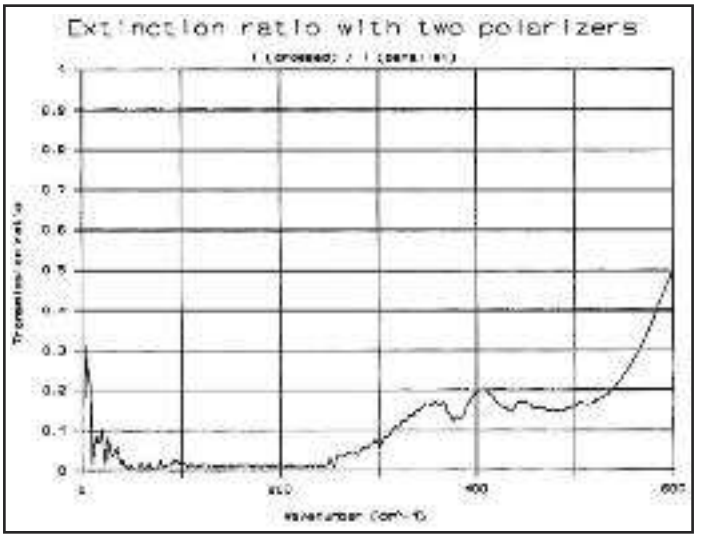


Sciencetech large area far-infrared grid polarizers P280 consist of a conducting grid of parallel wires on a thin substrate. They polarize light for wavelengths longer than the spacing between the wires with a very high degree of polarization.

The masters for the Sciencetech P280 grid polarizers are produced by Sciencetech's special holographic process and reproduced on a film substrate coated with aluminum using photolithographic techniques.

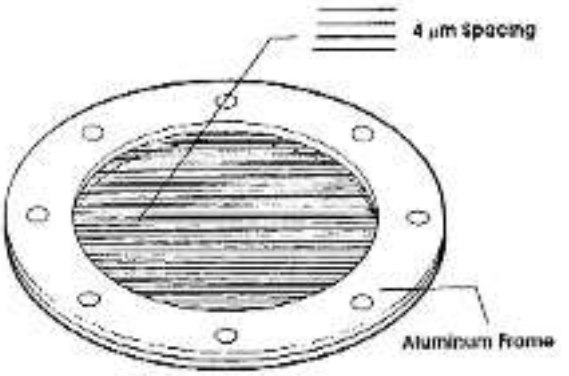
The Sciencetech P280 has the largest clear aperture available on the market for this type of device. This is especially important in the far-infrared, where energy is at a premium. It also has the widest spectral range with a higher frequency cutoff than that of other polarizers that work in the near-millimeter wavelength range.

The Sciencetech P280 is less sensitive to the angle of incidence than regular polarizers. Its line width and pitch are consistent throughout the whole area, making it especiallygood for interferometric applications. Special stainless steel frames are also available, ground to a flatness of better than 2µm.



Technical Specifications

Frequency Range: 2 - 800 cm^{-1} (0.5 - 5000µm)
Active Aperture: Standard Diameters
GP-1 1" (25.4mm)
GP-2 2" (50.8mm)
GP-3 3" (76.2mm)
GP-4 4" (101.6mm)
GP-5 5" (127mm)
Custom aperture available up to 5" active area
Grid Pitch: 4 µm
Grid Metal: Aluminum
Conductors cross section: 2 µm wide, 0.7 µm thick
Transmitted Intensity: > 85% for wavelengths > 30 µm
> 70% at 16 µm
Degree of Polarization: > 95%
Substrate: Polyethylene Terephthalate, 6 or 12 µm thick
Custom thicknesses from 1.5 to 50 µm available, other substrates available
Holder: Standard: black anodized aluminum holders. Outside diameter = active aperture + 1.5". Custom aluminum or stainless steel (magnetic or non-magnetic) holders can be provided. Stainless steel interferometric frames are available (< 2.0 µm thickness).



Model	Description	Price(USD)
GP-1	1" dia. infrared grid polarizer	
GP-2	2" dia. infrared grid polarizer	
GP-3	3" dia. infrared grid polarizer	
GP-4	4" dia. infrared grid polarizer	
GP-5	5" dia. infrared grid polarizer	

Single Fibres

Single Acrylic Fibre

Single fibres provide an excellent way of transporting energy from light sources to samples and from samples to detectors. Single fibres are efficient and economical and are therefore particularly useful for long distance applications. SMA and ST terminations are available for optical coupling. Single fibres have some advantages over fibre bundles (see following page), including better brightness retention, lower transmittance losses, higher damage threshold, more economical in longer lengths, and they require much smaller apertures and conduits. Single fibres work especially well with small light sources.

Sciencetech offers single fibres in both quartz and acrylic.

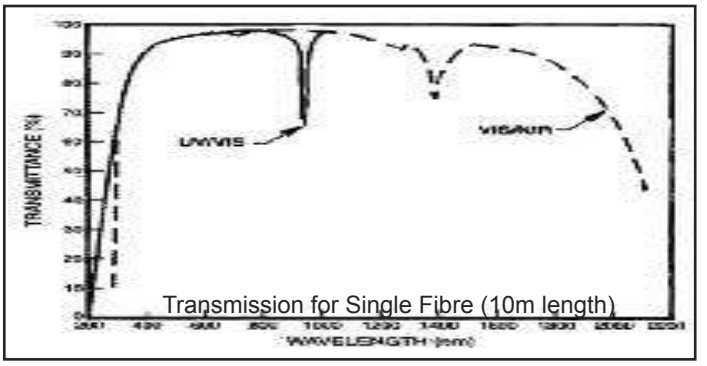
Quartz Fibres:

All fibres are 2 m in length and prices include 2 SMA connectors (optional ST connectors available).

Technical Specifications

Numerical Aperture: 0.22 ± 0.02
Damage Threshold*: 100 kW cm-2 or 10 J cm-2 for > 1ns pulses (wavelengths > 360 nm)
Jacket Material: Tefzel
*for perfectly clean, polished fibre with input fully focused within the core and within the fibre NA

Model	Core (µm) Diameter	Type*	Price (USD)
SF/200/UVS	200	UV-VIS	P.O.R
SF/400/UVS	400	UV-VIS	P.O.R
SF/600/UVS	600	UV-VIS	P.O.R
SF/1000/UVS	1000	UV-VIS	P.O.R
SF/200/IRS	200	VIS-IR	P.O.R
SF/400/IRS	400	VIS-IR	P.O.R
SF/600/IRS	600	VIS-IR	P.O.R
SF/1000/IRS	1000	VIS-IR	P.O.R
*Refer to transmission curve for more information.			



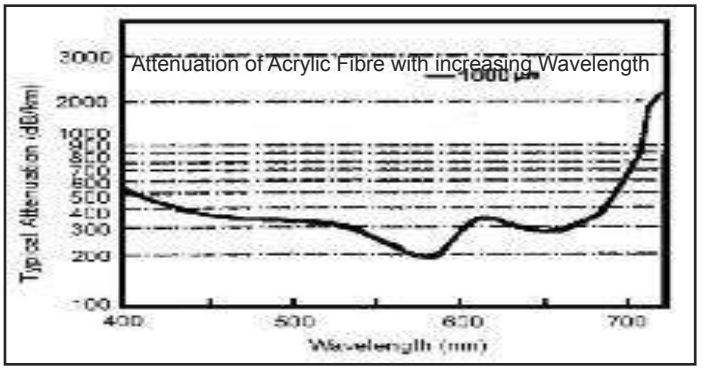
Transmission for Single Fibre (10m length)

Acrylic Fibres:

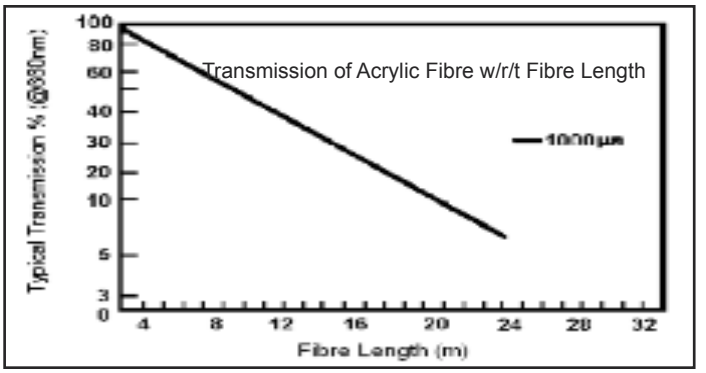
All fibres are 2 m in length and prices include 2 SMA connectors. Acrylic fibres are jacketed.

Technical Specifications

Numerical Aperture: 0.51 ± 0.03
Attenuation: 180 to 250 (dB/km @ 650nm)
Core Refractive Index: 1.492
Clad Refractive Index: 1.417
Jacket Material: Black Polyethylene
Acceptance Angle: 56°
Operating Temperature: -55 to +85°C



Attenuation of Acrylic Fibre with increasing Wavelength

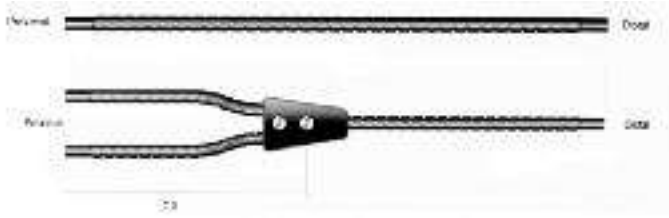


Transmission of Acrylic Fibre w/r/t Fibre Length

Model	Core (µm) Diameter	Type *	Price (USD)
SF/1000/AC	1000	See Graph	P.O.R
SF/1500/AC	1500	See Graph	P.O.R
SF/2000/AC	2000	See Graph	P.O.R
*Refer to transmission curve for more information.			

Fibre Bundles

Direct (top) and Bifurcated (bottom) Glass Fibre Bundles with Stainless Steel Sheathing



Fibre bundles feature a large diameter for high throughput from larger sources. Fibre bundles enclose the light path and eliminated the need for alignment of the instruments as well as having broad spectral ranges. Fibre bundles are used in applications where sources are large or have large filaments.

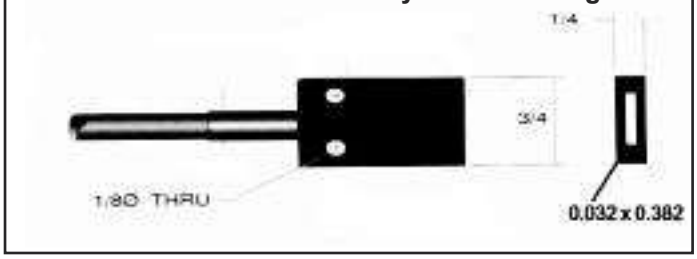
Sciencetech offers fibre bundles in quartz (silica-silica, silicapolymer) and glass (flint glass-soda lime).

Sciencetech offers a standard rectangular (slit type) termination for fibre bundles, making them especially suitable for input to a monochromator. 1/8" diameter bundles are offered in a circular to rectangular configuration. Standard active area for rectangular end is 0.382" x 0.032" (9.7 mm x 0.8 mm). Other nonstandard slit terminations are available.

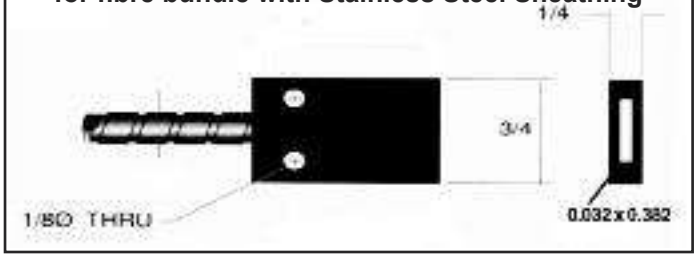
Glass Fibre Bundles:

Glass fibre bundles feature a core of flint glass and soda lime cladding. Individual fibre diameter is 0.05 mm. Glass bundles have a numerical aperture of 0.55 nominal, acceptance cone of 68° and a spectral range of 0.4 to 2.0 mm.

Standard Rectangular (slit) termination for fibre bundle with Polymer Sheathing



Standard Rectangular (slit) termination for fibre bundle with Stainless Steel Sheathing



Technical Specifications

Individual Fibre Diameter: 0.05 mm
Numerical Aperture: 0.55 (nominal)
Acceptance Cone: 68° (nominal)
Packing Fraction: 82% (nominal)
Spectral Transmittance: 0.4 to 2.1mm
Transmission Losses: 10%/ft at 0.6 mm
Chemical Resistance (Transmission Change):
- **Water:** (80°C, 250hrs) no change
- **Sulphuric Acid:** (22°C,100 hrs, 1.26 sp. gr.) no change
- **Engine Oil** (10W-30): (80°C, 100 hrs) no change
- **Gasoline:** 22°C, 100hrs) no change

Ethylene Glycol: (22°C,100hrs) 5% decrease

*Transmission can be affected by continuous immersion.

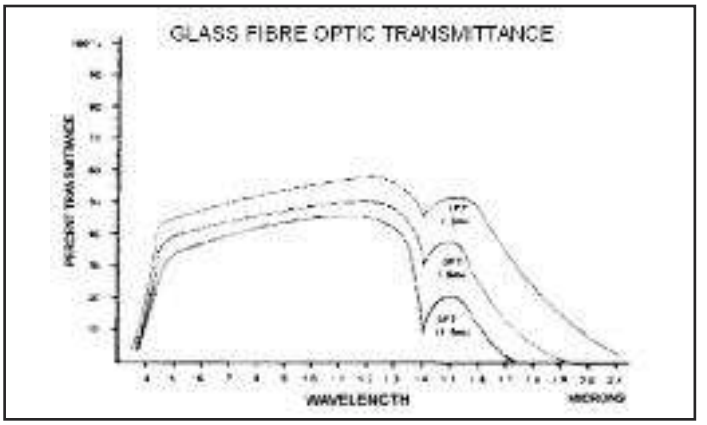
Vacuum Leak Test: No detectable amount of Helium when vacuum was applied down to 1×10^{-9} atmos, cc/sec at RT.

Sheathing: Stainless Steel or Polymer sheathing

Temperature Rating:
-40°C to 107°C for polymer sheathing
-40°C to 260°C for stainless steel

Bend Radius (bundle and sheathing limited):

Bundle Diameter	Bend Radius
1/8"	0.75" for polymer sheathing
	2" for stainless steel sheathing
1/4"	1.5" for polymer sheathing
	4" for stainless steel sheathing



Model	Description	Price (USD)
G436	Standard direct glass fibre bundle, 1/4" dia, 36" length	
G436B	Standard bifurcated glass fibre bundle, 1/4" diameter, common end, 36" length	
G836BX	Bifurcated glass bundle with stainless steel sheathing, common bundle slit termination, 1/8" diameter, 36" length	

Fibre Bundles with slit termination in one end (Common end for bifurcated bundles)

Bifurcated bundles:

Total bundles length: 36” (914 mm)

Common end length: 6” (152 mm)

Core diameter common end (distal): 1/8” (3.17 mm) diameter

Distal termination rectangle active area: 0.8 mm x 9.7 mm

External dimensions of rectangular flare:
1” length, 3/4 heigth, 1/4 width.

Available in:

a. Glass core. Standard sheathing PVC monocoil.

b. UV optical grade fused silica core. Siloxane Polymer cladding. Standard sheathing PVC monocoil.

c. UV optical grade fused silica core, silica cladding. Stainless steel sheathing.

Prices for bifurcated bundles (rectangular termination in common end, circle in bifurcated legs)

Model	Description	Price (USD)
G836B	Bifurcated bundled glass 1/8"dia, 36"long. Slit termination in common end	P.O.R
UVQF836B	Bifurcated bundled UV polymer clad quartz, 1/8" dia, 36" long. Slit termination in common end	P.O.R
UVSSG836B	Bifurcated bundled UV silicasilica, 1/8" dia, 46" long. Slit termination in common end	P.O.R

Prices for straight bundles (rectangular to circle)

Model	Description	Price (USD)
GF836	Single bundle with slit termination in one end. Glass, 1/8" dia, 36" long	P.O.R
UVQF836	Single bundle with slit termination in one end. UV polymer clad quartz, 1/8" dia, 36" long	P.O.R
UVSSG836	Single bundle with slit termination in one end. UV silica-silica, 1/8" dia, 36" long	P.O.R

Quartz Fibre Bundles:
Sciencetech offers three types of quartz fibre bundles:

Silica-silica bundles feature a fused silica core with fused silica cladding. Silica-silica bundles have a numerical aperture of 0.22 and an acceptance cone of 25o nominal. Typical individual fibre diameter is 0.1 mm. The spectral range of silica-silica bundles is 0.2 to 2.1 mm. These bundles are practically free of secondary fluorescence at 0.254 mm and exhibit no discoloration under Xray, gamma or short UV radiation.

Polymer-clad quartz bundles feature a core of fused silica and siloxane polymer cladding. These bundles have a numerical aperture of 0.3 and an acceptance cone of 35o nominal. Typical individual fibre diameter is 0.25 mm. The spectral range of polymer- clad quartz bundles is 0.22 to 2.2 mm. These bundles are practically free of secondary fluorescence at 0.254 mm and exhibit no discoloration under X-ray, gamma or short UV radiation.

Extended Infrared Polymer-clad quartz bundles feature a core of fused silica and siloxane polymer cladding. These bundles have a numerical aperture of 0.3 and an acceptance cone of 35^{o} nominal. Typical individual fibre diameter is 0.25 mm. The spectral range of polymer-clad quartz bundles is 0.3 to 2.7 mm. Extended infrared polymer-clad quartz bundles are free of water absorption dip at 1.4 mm.

Technical Specifications

Silica-Silica Bundles

Individual Fibre Diameter: 0.1 mm
Numerical Aperture: 0.22
Acceptance Cone: 25^{o} (nominal)
Spectral Transmittance: 0.2 to 2.1mm
(see curve on following page)
Sheathing: Stainless Steel or Polymer sheathing
Temperature Rating: -40^{o}C to 260^{o}C
(higher temperature also available)

Bend Radius: Bundle Diameter	**Bend Radius**
1/16”, 1/8”	1.5”
1/4”	3”

Maximum Breakage: 10%

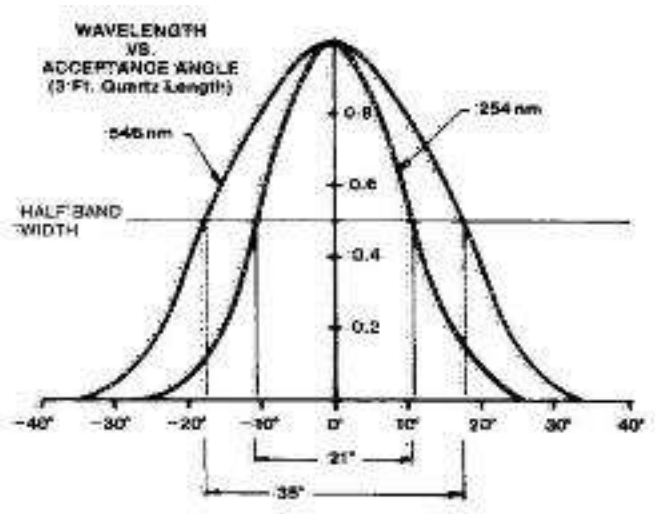
Polymer-clad Quartz Bundles

Individual Fibre Diameter: 0.25 mm
Numerical Aperture: 0.3
Acceptance Cone: 38^{o} (nominal)
Spectral Transmittance: 0.22 to 2.7mm
(see curve on following page)
Sheathing: Stainless Steel or Polymer sheathing
Temperature Rating:
-40^{o}C to 105^{o}C for polymer sheathing
-40^{o}C to 175^{o}C for stainless steel

Bend Radius: Bundle Diameter	**Bend Radius**
1/16”, 1/8”	1.5”
1/4”	3”

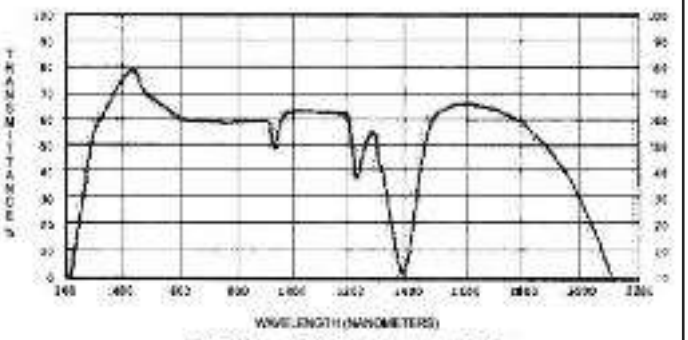
Maximum Breakage: 10%

Change in Aperture with Wavelength for Polymer-clad Quartz bundles*



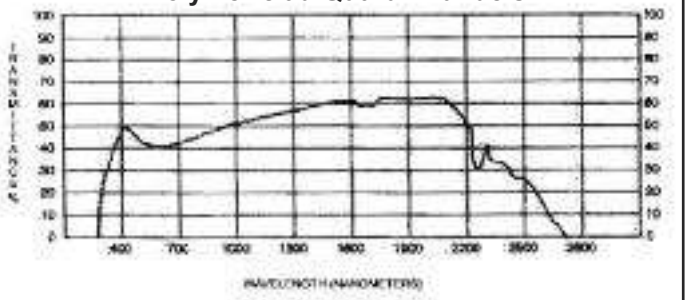
*Change minimal for silica-silica bundles

Transmission for Silica-Silica Bundles



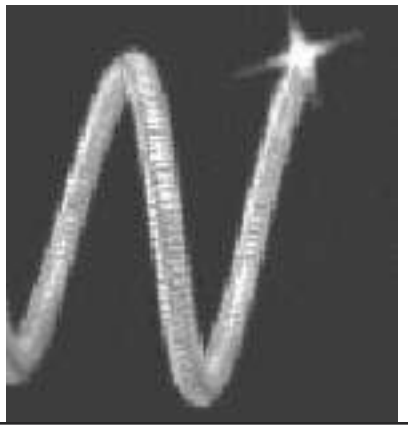
⅛" ø x 36" long bundle

Transmission for Extended Infrared Polymer-clad Quardz Bundels



⅛" ø x 36" long bundle

Fibre Optic Bundle with Stainless Steel Sheathing



Aperture Angle 2 α

Length	@254 nm	@546 nm
12" (30.5 cm)	24° ± 5°	40° ± 5°
36" (91.4 cm)	21° ± 5°	35° ± 5°
60" (152.4 cm)	20° ± 5°	33° ± 5°

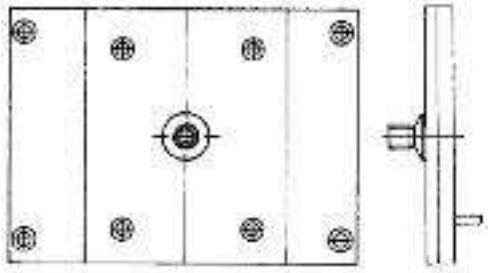
Model	Description	Price(USD
UVSS836	Straight silica-silica bundle, 1/8" diameter, 36" long	P.O.R
UVSS872	Straight silica-silica bundle, 1/8" diameter, 72" length	P.O.R
UVSS672	Straight silica-silica bundle, 1/16" diameter, 72" length	P.O.R
UVSS436	Straight silica-silica bundle, 1/4" diameter, 36" long	P.O.R
UVSS836B	Bifurcated silica-silica bundle, 1/8" diameter, 36" long	P.O.R
Polymer Sheathing		
UVQ836	Straight UV polymer-clad quartz bundle, 1/8" dia. 36" long	P.O.R
IRQ836	Straight IR polymer-clad quartz bundle, 1/8" dia. 36" long	P.O.R
UVQ836B	Bifurcated UV polymer-clad quartz bundle, 1/8" dia. 36" long	P.O.R
IRQ836B	Bifurcated IR polymer-clad quartz bundle, 1/8" dia. 36" long	P.O.R
Stainless Steel Sheathing		
UVQ836X	Straight UV polymer-clad quartz bundle, 1/8" dia. 36" long	P.O.R
IRQ836X	Straight IR polymer-clad quartz bundle, 1/8" dia. 36" long	P.O.R
UVQ836BX	Bifurcated UV polymer-clad quartz bundle, 1/8" dia. 36" long	P.O.R
IRQ836BX	Bifurcated IR polymer-clad quartz bundle, 1/8" dia. 36" long	P.O.R

Fibre Optic Accessories

Single Fibre Optic Receptacle with SMA-type connector 945011(fib1)

Easily mounted on Sciencetech monochromators at housing for fixed slits.

Housing for Fixed Slits and SMA Fibre Optic Connector used on Sciencetech Monochromators



Fibre Optic Bundle Attach B949004

Bundle attachment for up to 6 mm diameter fibre bundles. Easily mounted on Sciencetech monochromators.

Version Model	Version Description	Version Price(USD)
FIB1	Fibre Optic Receptacle	
FIB2	Fibre Optic Bundle Attachment	P.O.R
FIB3	Fibre Bundles and Fiber Adapter	P.O.R
FCM55	Fibre coupler / Matcher	

Fibre Bundles and Fibre Adapter

Fibre Adaptor & Fibre optic bundle holder adjustable from 1 mm to 2 mm diameter, self-centering. Easily mounted on Sciencetech monochromators.

Fibre Coupler/Matcher Model FCM55

The monochromator fibre coupler/matcher performs three functions:

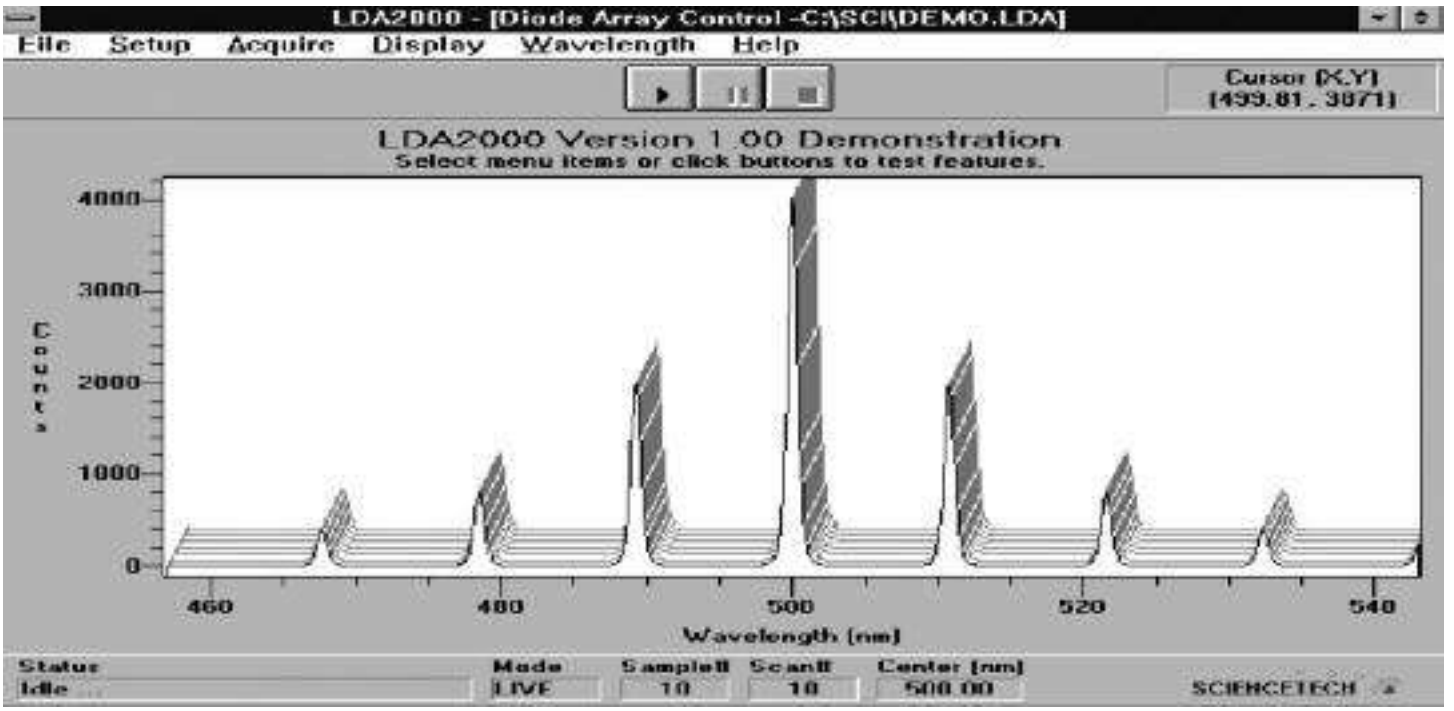
- matching f number of the fibre bundle to that of the 9055/ 9056 monochromators
- decreasing stray light
- correcting monochromator astigmatism

The fibre coupler can replace an input or exit slit. The image of the fibre bundle projected onto the position of the slit then becomes the effective slit.The optics of the fibre coupler consist of a spherical mirror coated with Al/MgF2 with tilt, pitch, and focus adjustments. It is housed in a light tight enclosure with an input flange to match the standard screw pattern of Sciencetech monochromators.

The spherical mirror is tilted vertically with respect to the monochromator axis for the use of large fibres or fibre bundles with no beam obstruction. The tilt angle has been chosen using ray tracing to fully compensate the astigmatism of Sciencetech's 9055/9056 family of monochromators. This compensation produces imaging of the input slit onto the fibre, allowing imaging system operation (i.e., the detection of individual spectra if they are vertically separated at the input of the system).

The magnification of the system is 2.5:1, allowing the optimum throughput/bandwidth compromise when standard quartz fibre bundles and Sciencetech's 9055/9056 monochromators are used.The use of a single mirror gives an achromatic matcher and minimizes reflection losses due to mirror absorption and scattering.This is particularly important in deep UV where lightsources have low brightness and broadband reflective coatings (Al/MgF2) have typical efficiencies of the order of 85-90%, as well as in the region around 700 nm where Al has a reflection minimum.

LDA2000 Monochromator/Spectrograph Control Software



LDA2000 is a user friendly monochromator/spectrograph control and data acquisition package for Sciencetech monochromators equipped with linear diode array detectors. LDA2000 runs under the popular Microsoft Windows® operating environment on IBM PC compatible computer systems.

Features

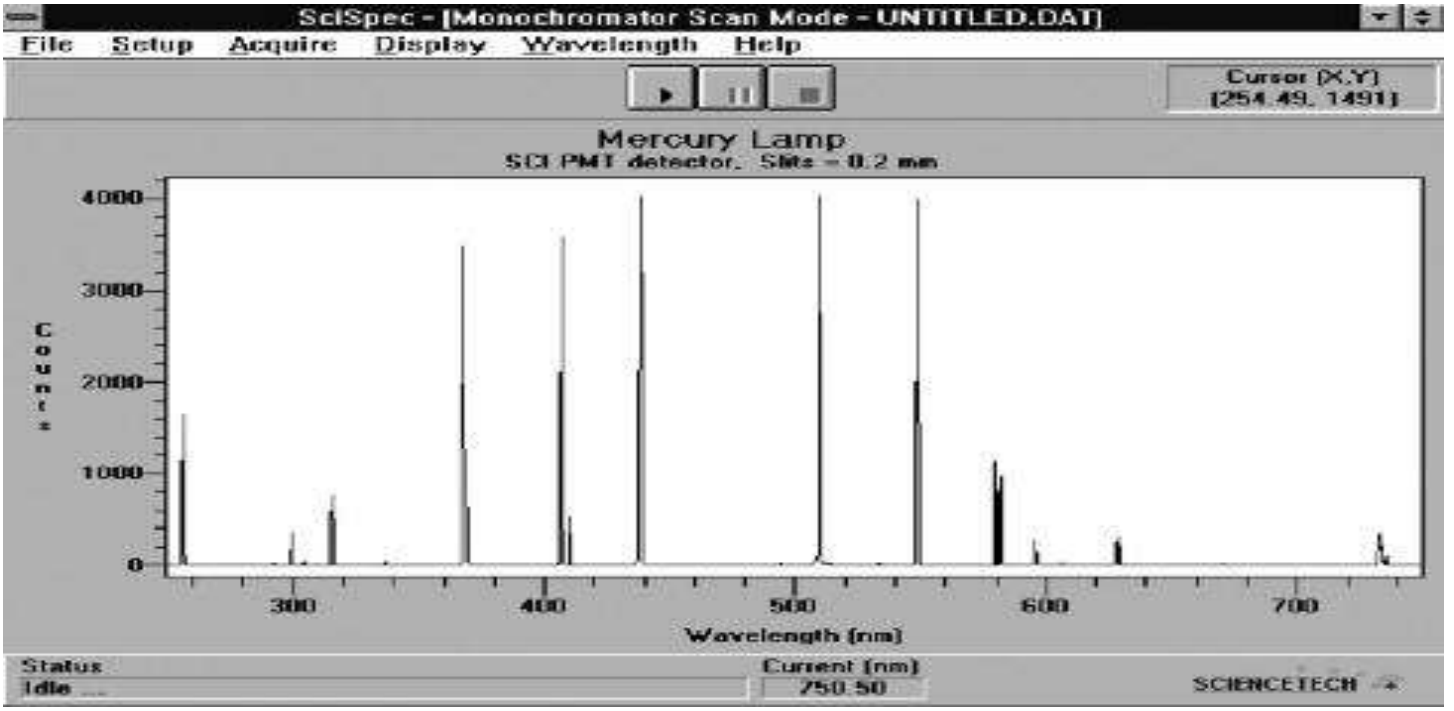
- High quality real time 3D graphics display
- Display signal level or ratio (absorbance or transmittance) in real time as data is being acquired
- Real time averaging and background subtraction
- Burst Mode for high speed data acquisition
- Acquire, display, and store multiple spectra - limited only by computer memory
- Measure peak positions and intensities with mouse cursor
- Scale trace amplitude to fill screen with mouse click
- Zoom in on any region by drawing rectangle with mouse
- Flexible axis scaling
- Set exact axis limits
- Wavelengths in nanometers, angstroms, or micrometers
- Absolute or Relative Energy in Wavenumbers or Electron Volts
- Signal in A/D counts, Absorbance, or %Transmittance
- Select 3D or single trace display
- Set tick mark spacing, number format and axis labels
- Windows style Print and Print Setup Options
- File Save and Retrieve with standard Windows dialogue boxes
- Data saved in ASCII files - easily imported into standard analysis packages
- Setup saved and retrieved with data files
- Setup automatically saved on exit and restored when program is restarted
- Convenient Wavelength Control Window
- Step center wavelength with adjustable step size
- Go to selected center wavelength
- Real time graphical signal level indicator facilitates setup and alignment
- Intuitive Windows style menus

System Requirements

- IBM compatible PC with Pentium processor running Microsoft Windows 3.1 or higher operating system
- RS-232 serial communications port for monochromator control
- Expansion slot for data acquisition card
- Sciencetech motor drive monochromator
- Sciencetech linear diode array detector
- Custom high speed data acquisition card

Item	Description	Price (USD)
LDA 2000 Software	Monochromator/spectrograph control and data acquisition package	P.O.R
CCD 2000	Control Software for two dimensional Detectors Arry	P.O.R

SciSpec Monochromator Control Software



SciSpec is a user friendly monochromator control and data acquisition package that runs under the popular Microsoft Windows operating environment on IBM PC compatible computer systems.

Features

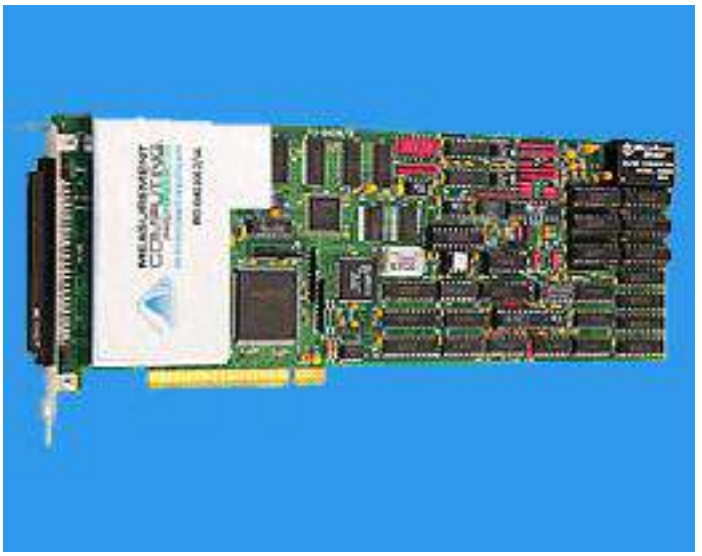
- High quality real time graphics display
- Display signal level or ratio (absorbance or transmittance) in real time as data is being acquired
- Wavelength and Temporal Scan Modes
- scan mono chromator or collect data as a function of time
- Measure peak positions and intensities with mouse cursor
- Scale trace amplitude to fill screen with mouse click
- Zoom in on any region by drawing rectangle with mouse
- Flexible axis scaling
- Set exact axis limits
- Wavelengths in nm, Angstroms, or Micrometers
- Absolute or Relative Energy in Wavenumbers or eV
- Time in seconds or minutes
- Signal in A/D counts, Absorbance, or %Transmittance
- Set tick mark spacing, number format and axis labels
- Windows style Print and Print Setup Options
- File Save and Retrieve with standard Windows dialogue boxes
- Data saved in ASCII files - easily imported into standard analysis packages
- Setup saved and retrieved with data files
- Setup automatically saved on exit and restored when program is restarted
- Convenient Wavelength Control Window
- Step Wavelength with adjustable step size
- Go to selected wavelength
- Real time graphical signal level indicator facilitates setup and alignment
- Intuitive Windows style menus

System Requirements

IBM compatible PC with Pentium processor running Microsoft Windows 3.1 or higher operating system with RS-232 serial communications port for monochromator control and expansion slot for data acquisition card, Sciencetech motor drive monochromator, Metrabyte compatible data acquisition card.

Description	Price(USD)
SciSpec Standard Software	

Data Acquisition Boards for Sciencetech Modular Spectroscopic Systems



12-bit Data Acquisition AD Board

12-bit Data Acquisition AD Board is required to digitize the detector signal into the computer and control its shutter (if available). It consists of a BNC ribbon cable connector for data connection to the detector, a 12-bit A/D PCI data acquisition board, and Sciencetech's Windows based SCI-SPEC or SCI-LDA software application to display and save digitized detector in real time. The detector head is connected to the BNC to ribbon cable which is then connected to the 12-bit A/D PCI data acquisition board inside a Windows based computer's available PCI slot.

A 16-bit A/D is also available for cooled detectors in sensitive low noise applications. This board can also control the Uniblize shutter using Sciencetech's Read-LDA Active-X software and a separate BNC connector (included).

16-Bit Data Acquisition AD Board

This PCI Analog to Digital (AD) Data Acquisition Board is used to digitize the signal from a Sciencetech Linear Array or Single Channel detector into a Windows based computer.

A cable (sold separately and different for each type of detector) is required to connect the detector to this AD Data Acquisition Card. Sciencetech SCI-LDA and READLDA (for linear array detectors), and SCI-SPEC and READDETECTOR (for single element and PMT detectors) are designed for operation with this data acquisition card. SCILDA and SCI-SPEC are fully featured applications that are sold separately, while READ-LDA and READ-DETECTOR are simple Active-X controls that are available free of charge.

For Sciencetech linear array detectors, a separate PCI counter board (sold separately) is also required for use with Sciencetech software.

Description	Price(USD)
Standard PCI	
Hi -Gain PCI	
Standard- with Cable +Read-LDA for Shutter Control	
PCI for Windows Based PC	

Computer Systems

PC computer systems and other components are available to suite your spectroscopy needs. Please call or email Sciencetech Inc. to inquire.

Accessories and Options

Description	Price(USD)
2 ft Single-Channel Detector Data Base	
2 ft Multi-Channel Detector Data Base	0
Counter Board Data Acquisition System	1
Sci-LDA Spectrograph Software	0
Sci-Spec Scanning Monochromator Software	

Monochromator Scanning Software

Sciencetech Inc. offers this software package to every buyer of Sciencetech's motorized monochromators. All of Sciencetech's motorized monochromators use a microprocessor controlled drive, so the only hardware required in your computer is an RS232 port. The software is for IBM compatible computers.

- Menu driven
- Every monochromator has its own configuration file. One of the parameters in it is the number of microsteps from the zero to the limit switch, so automatic zeroing is one of the options of the initial menu. The other option is to enter a calibration wavelength.
- One, two or three gratings selection
- Scanning or "go to wavelength"
- Setting of wavelength limits, step size
- Jog up and down for a wavelength value; absolute or relative wavelength
- Error messages
- Help features

Note: This program does not include data collection routines.

RamanSoft Software

RamanSoft is a software package designed to enable efficient use of Raman spectroscopy data and to access the advanced features of the LUMUC Series Raman Systems. RamanSoft provides unique features for system automation, data processing and data analysis, powered by proprietary and innovative algorithms for automatic background removal to ensure rapid acquisition of quality spectral data. The user-friendly interfaces give easy access to advanced features including automated spectral library searching, qualitative and/or quantitative spectral analysis, and real time process monitoring. The combination of RamanSoft and the powerful acquisition capacity of the LUMUC Series Raman systems offer users a unique opportunity to harness and utilize this state-of-the-art photonics technology.

System Automation

RamanSoft provides system automation. All data processing algorithms can be activated by selecting them under System Automation Setup. The “raw” data and the “processed” data automatically appear upon spectrum acquisition in the Acquisition and Analysis windows, respectively.

Ease-of-use

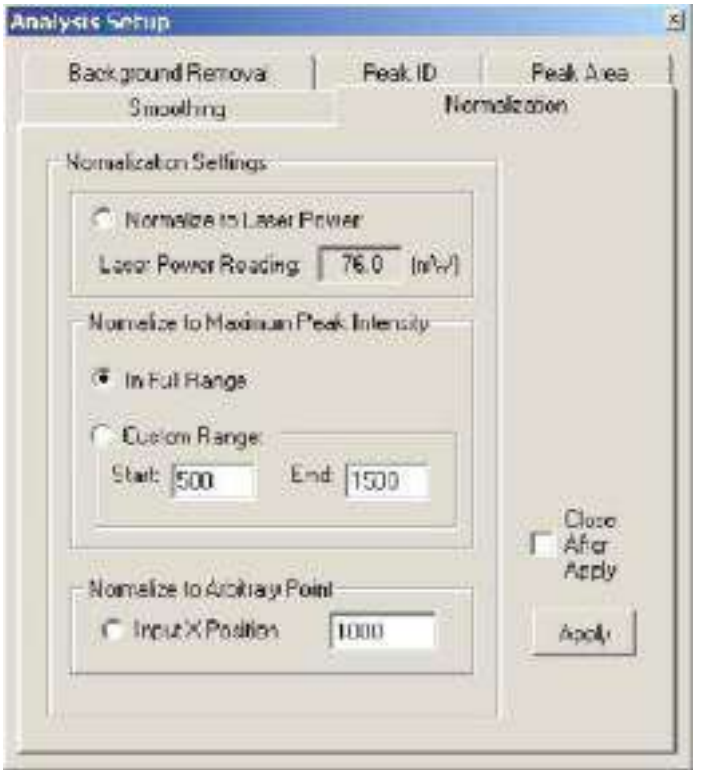
The user can access the data processing algorithms after spectrum acquisition simply by pressing convenient toolbar buttons. Your preset data processing parameters can be applied to the spectrum in the Analysis Window by pressing **S** for smoothing, **N** for Normalization, **B** for Background Removal, **PI** for Peak Identification, and **PA** for Peak Area calculation. Other important and convenient toolbar controls are Acq for Acquisition, Cont for Continuous Acquisition, some other features such as zoom and cursor functions, and access to system functionalities.

Key Features

- Software control of laser power, CCD gain and digitization rate
- Auto system calibration with calibration kit (Optional)
- Auto system test with sealed cyclohexane standard
- Automatic & manual background removal, signal averaging, normalization, spectrum overlay
- Peak ID, peak area, Spectrum Search, SpectrumPredict, Real Time Monitoring
- User-definable automation sequences for seamless data processing / data analysis

Data Processing

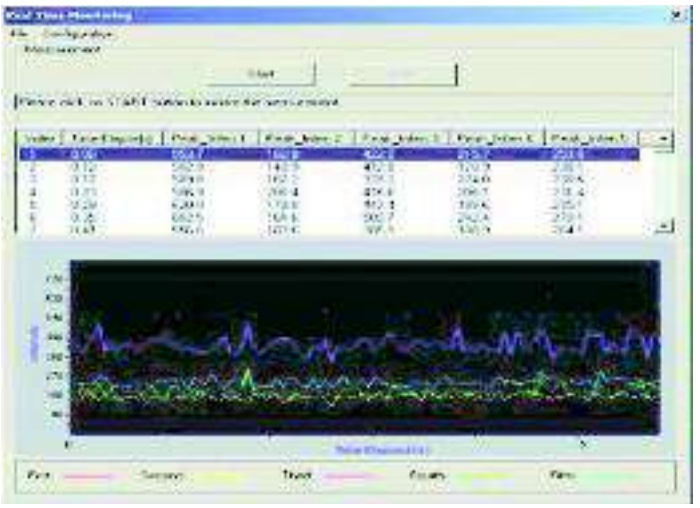
RamanSoft offers the data processing tools professional users need to obtain critical answers to their analytical questions. A series of drop-down windows allows the operator to configure Smoothing, Normalization, Background Removal, Peak Identification, and Peak Area algorithms.

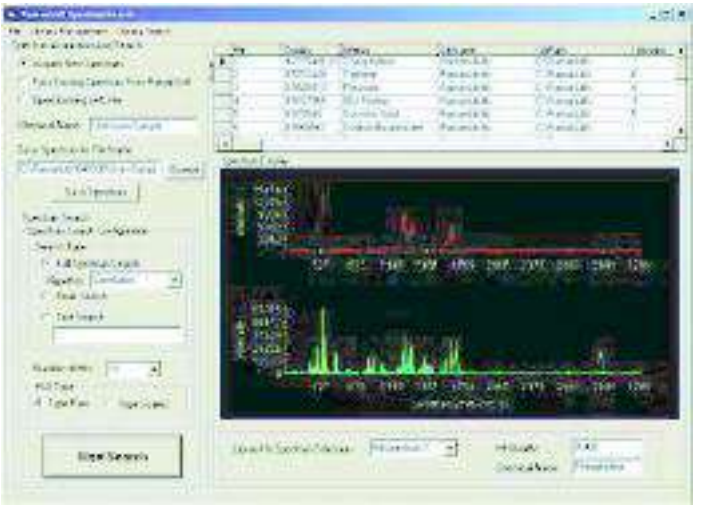


Data Analysis

To achieve the quality spectra required for molecular identification, unique background removal algorithms are provided. Users can now meet the most challenging and demanding needs for QA/QC and process monitoring in real time. The raw spectrum in the upper Acquisition Window is of caffeine in a brown bottle obtained with the Vector Raman Probe in 1 second. The background removed and efficiency-corrected spectrum (green) is automatically displayed in the lower Analysis Window.

Dimension-P1 and RamanSoft provide an easy-to-use tool to meet critical needs for real time process monitoring. The system tracks up to five user defined peaks by either intensity or area. Shown on the left is an example of monitoring five peaks of aspirin with a time interval of 50 ms. The intensities are tabulated in the center panel and displayed in the lower panel as a function of time.





Through a one-step acquisition/search interface, seamless integration of RamanSoft with GRAMS Spectral ID® delivers rapid spectrum acquisition and library searching by just pressing “Start Search”. Shown on the right, are the search results for theophylline in a plastic bag. Using the Vector Raman Probe, theophylline is clearly distinguished from other methyl xanthine molecules. Upper trace: spectrum; lower trace: best matched library spectrum.

One-step acquisition/prediction using Chemometric methods is achieved by just pressing “Predict” on the integrated RamanSoft /GRAMS IQ Predict interface. PLS quantification of 30% acetone, one second acquisition, in the presence of a large confounding toluene signal is demonstrated on the left. Upper trace: spectrum of 30% acetone test sample; lower trace: after subtraction by “Predict” spectrum.