High Performance TE-Cooled Backthinned Spectrometer



High Performance TE-Cooled Backthinned Spectrometer

Scientific-grade High Performance

Extremely Low Dark Noise and Stray Light for Spectrophotometer/ Spectro-radiometer

High Signal to Noise Ratio

High Ultra-Violet Quantum Efficiency

High Speed Data Acquisition

Optical Dark Option (Auto Shutter)



The Choice for Low Signal Level Applications

Spectral Products is offering the new SM303 TE cooled back thinned 1024-pixel array CCD spectrometer. The SM303 provides high quantum efficiency in UV and high dynamic range. It is ideal for UV/VIS/NIR spectrometry that requires very high signal to noise ratio and/or high dynamic range, like photoluminescence, Raman spectroscopy, measurement of photometric and radiometric values of light sources(LED, OLED, solar cell, etc.) applications

The back-thinned CCD has excellent sensitivity in UV and allows deep UV application.

Well designed housing allows up to an 850nm measurement window from 200nm to 1050nm (smaller measurement window sizes increase spectral resolution and light sensitivity) with very low stray light. The TE cooled detector also help to measure very low light signals by reducing the noise level in long integration times.

Thanks to high dynamic range and low noise level, the SM303 is also ideal for radiometric measurement applications.

Standard interface of the SM303 series is a USB 1.1/2.0 compatible interface with 16-bit AD conversion. Our USB board can support multichannel configuration up to 8. With this multichannel configuration, a high resolution for wide range or a dual spectrometer system (one for measurement and the other for reference) is possible.

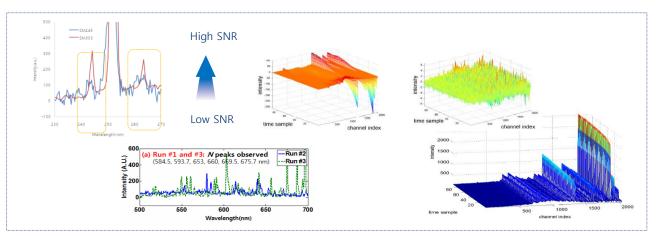
Software support includes an SDK and DLLs for dedicated applications development and our SM32Pro Windowsbased spectral acquisition and analysis software.

Specifications:

Dimensions 6.81 X 4.72 X 3.14 inches (173 X 120 X 79.8 mm) Weight 4.41bs (2.0kg) Fiber Optic Connector SMA905 N.A.=0.22 Optical Fiber Input Detector Hamamatsu S7031-1006 Hamamatsu S10141-11075 (TE Cooled Backthinned FFT CCD) TC Cooling (-10°C) Cooling One Stage TE(thermo-electric) Cooling (-10°C) Cooling (-10°C) Spectral Response Range ~200 - 1100nm at max ~200 - 1100nm at max Pixels 1044 X 64 pixels (Total) 2068 X 128 pixels (Total) Pixels 1044 X 64 pixels (Total) 2068 X 122 pixels (Effective) Pixel Size 24 um X 24 um 12 um X 12 um Active Area 24.576 mm X 1.392 nm 24.576 mm X 1.464 mm Full Well Capacity 500 Ke (Vertical) 500 Ke (Horizontal) Soo Ke - (Vertical) 500 Ke (Horizontal) 500 Ke (Horizontal) Quantum Efficiency >90% @ 650nm 90% or higher at peak Wavelength Range Full Range: ~200-1100nm UV/VIS Range: ~200-350nm Visible Range: ~200-1100nm UV/VIS Range: ~200-350nm UV/VIS Range: ~200-350nm Optical Resolution ~0.5-10nm, dependent on spectral range, slit width, and fiber diameter Dark Noise RM5	Physical Dimension			
Fiber Optic Connector SMA905 N.A.=0.22 Optical Fiber Input Detector Detector Hamamatsu S7031-1006 Hamamatsu S10141-11075 Cooling One Stage TE(thermo-electric) One Stage TE(thermo-electric) Cooling (-10°C) Spectral Response Range ~200 - 1100nm at max ~200 - 1100nm at max ~200 - 1100nm at max Pixels 1044 X 64 pixels (Total) 2068 X 128 pixels (Total) Pixels (Total) Pixels 1024 X 58 pixels (Effective) 2048 X 122 pixels (Effective) Pixels 1024 X 58 pixels (Effective) 2048 X 122 pixels (Effective) Pixels 00 Ke - (Vertical) 70 Ke - (Vertical) Full Well Capacity 300 Ke - (Vertical) 70 Ke - (Vertical) Gob Ke - (Horizontal) 500 Ke - (Horizontal) 90% or higher at peak Quantum Efficiency Optical Specification V/VIS Range: ~200-350nm Wavelength Range Full Range: ~200-300nm UV/VIS Range: ~300-760nm Other user customized ranges are available Optical Specification VIS/VIS Range: ~300-760nm Dark Noise RMS TYP <2 @Min. Integration Time	Dimensions	-		
Detector Detector Hamamatsu S7031-1006 Hamamatsu S10141-11075 (TE Cooled Backthinned FFT CCD) Cooling Backthinned FFT CCD) Cooling One Stage TE(thermo-electric) One Stage TE(thermo-electric) Cooling (-10°C) Spectral Response Range ~200 - 1100nm at max ~200 - 1100nm at max ~200 - 1100nm at max Pixels ~200 - 1100nm at max ~200 - 1100nm at max ~200 - 1100nm at max Pixels ~204 x 58 pixels (Effective) 2048 X 122 pixels (Effective) Pixel Size 24 um X 24 um 12 um X 12 um Active Area 24.576 mm X 1.392 mm 24.576 mm X 1.464 mm Full Well Capacity 600 Ke- (Horizontal) 70 Ke- (Vertical) Goo Ke- (Horizontal) 500 Ke- (Horizontal) 500 Ke- (Horizontal) Quantum Efficiency >90% @ 650nm 90% or higher at peak UV/VIS Range: ~200-550nm UV/VIS Range: ~200-550nm UV/VIS Range: ~200-550nm Quantum Efficiency ~00ther user customized ranges are available TOP Optical Resolution ~0.5-0nm, dependent on spectral range, slit width, and fiber diameter Dark Noise RMS TYP <2 @Min. Integra	Weight	4.41lbs (2.0kg)		
DetectorHamamatsu S7031-1006 (TE Cooled Backthinned FFT CCD)Hamamatsu S10141-1107S (TE Cooled Backthinned FFT CCD)CoolingOne Stage TE(thermo-electric) Cooling (-10°C)One Stage TE(thermo-electric) Cooling (-10°C)Spectral Response Range~200 - 1100nm at max 1044 X 64 pixels (Total)2068 X 128 pixels (Total)Pixels1044 X 64 pixels (Total)2068 X 128 pixels (Effective)Pixels24 wm X 24 um 600 Ke- (Vertical)204 K 32 pixels (Effective)Full Well Capacity300 Ke- (Vertical) 	Fiber Optic Connector	SMA905 N.A.=0.22 Optical Fiber Input		
Detector(TE Cooled Backthinned FFT CCD)(TE Cooled Backthinned FFT CCD)CoolingOne Stage TE(thermo-electric) Cooling (-10°C)One Stage TE(thermo-electric) Cooling (-10°C)Spectral Response Range~200 - 1100nm at max ~200 - 1100nm at max~200 - 1100nm at maxPixels1044 X 64 pixels (Total)2068 X 128 pixels (Effective)Pixels1044 X 54 pixels (Effective)2048 X 122 pixels (Effective)Pixels1024 X 58 pixels (Effective)2048 X 122 pixels (Effective)Pixels24 um X 24 um12 um X 12 umActive Area24.576 mm X 1.392 mm24.576 mm X 1.464 mmFull Well Capacity600 Ke- (Horizontal)500 Ke- (Horizontal)Quantum Efficiency>90% of Sonm90% or higher at peakWavelength RangeFull Range: ~200-1100nmUV/VIS Range: ~200-350nmVisible Range: ~200-1100nmUV/VIS Range: ~200-350nmVisible Range: ~200-350nmUV/VIS Range: ~200-350nmSignal to Noise RMSTYP <2 @Min. Integration Time				
CoolingCooling (-10°C)Cooling (-10°C)Spectral Response Range~200 + 1100mm at max~200 + 1100mm at maxPixels1044 × 64 pixels (Total)2068 × 128 pixels (Total)Pixels1024 × 58 pixels (Effective)2048 × 122 pixels (Effective)Pixel Size24 um X 24 um12 um X 12 umActive Area24.576 mm X 1.392 mm24.576 mm X 1.464 mmFull Well Capacity300 Ke - (Vertical) 600 Ke - (Vortical)500 Ke - (Vertical) 500 Ke - (Vortical)Quantum Efficiency>90% @ 650nm90% or higher at peakWavelength RangeFull Range: ~200-1100nm Visible Range: ~200-2650nmUV/VIS Range: ~200-850nmOptical Resolution~0.5-10nm, dependent on spectral range, slit width, and fiber diameterDarkAuto ShutterDarkAuto ShutterSignal to Noise Ratio>1000 : 1 at single scanSignal to Noise Ratio>1000 : 1 at single scanStray Light<0.05% AVG	Detector			
1044 X 64 pixels (Total) 2068 X 128 pixels (Total) Pixel Size 24 um X 24 um 2048 X 122 pixels (Effective) Pixel Size 24 um X 24 um 12 um X 12 um Active Area 24.576 mm X 1.392 mm 24.576 mm X 1.464 mm Full Well Capacity 300 Ke - (Vertical) 70 Ke - (Vertical) G00 Ke - (Vertical) 500 Ke - (Horizontal) 90% or higher at peak Quantum Efficiency >90% @ 650nm 90% or higher at peak Wavelength Range Full Range: "200-1100nm UV/VIS Range: "200-850nm Visible Range: "200-500m UV/VIS Range: "200-600m UV/VIS Range: "200-600m Optical Resolution °0.5-10nm, dependent on spectral range, slit width, and fiber diameter Dark Auto Shutter Dark Dark Noise RMS TYP +2 @Min. Integration Time TYP <7 @Min. Integration Time	Cooling			
Pixels1024 X 58 pixels (Effective)2048 X 122 pixels (Effective)Pixel Size24 um X 24 um12 um X 12 umActive Area24.576 mm X 1.392 mm24.576 mm X 1.464 mmFull Well Capacity300 Ke- (Vertical) 600 Ke- (Horizontal)70 Ke- (Vertical) 90% or higher at peakQuantum Efficiency>90% @ 650nm90% or higher at peakOptical SpecificationFull Range: ~200-1100nm UV/VIS Range: ~200-850nm90% or higher at peakOptical Resolution~0.5-10nm, dependent on spectral range, slit width, and fiber diameterDarkAuto ShutterDarkAuto ShutterDark Noise RMSTYP <2 @Min. Integration Time	Spectral Response Range	~200 - 1100nm at max	~200 - 1100nm at max	
1024 X 58 pixels (Effective)2048 X 122 pixels (Effective)Pixel Size24 um X 24 um12 um X 12 umActive Area24.576 mm X 1.392 mm24.576 mm X 1.464 mmFull Well Capacity300 Ke- (Vertical)500 Ke- (Vertical)Gou Ke- (Horizontal)500 Ke- (Vertical)500 Ke- (Vertical)Quantum Efficiency>90% @ 650nm90% or higher at peakOptical SpecificationOptical SpecificationWavelength RangeUV/VIS Range: ~200-1100nmUV/VIS Range: ~200-850nmVisible Range: ~380-760nmOther user customized ranges are availableOptical Resolution~0.5-10nm, dependent on spectral range, slit width, and fiber diameterDarkAuto ShutterDark Noise RMSTYP <2 @Min. Integration Time		1044 X 64 pixels (Total)	2068 X 128 pixels (Total)	
Active Area24.576 mm X 1.392 mm24.576 mm X 1.464 mmFull Well Capacity300 Ke- (Vertical) 600 Ke- (Horizontal)70 Ke- (Vertical) 500 Ke- (Horizontal)Quantum Efficiency>90% @ 650nm90% or higher at peakOptical SpecificationWavelength RangeFull Range: ~200-1100nm UV/VIS Range: ~200-850nm Visible Range: ~380-760nm Other user customized ranges are availableOptical Resolution~0.5-10nm, dependent on spectral range, slit width, and fiber diameterDarkAuto ShutterDark Noise RMSTYP <2 @Min. Integration Time \$1000 : 1 at single scanSignal to Noise Ratio>1000 : 1 at single scanSignal to Noise Ratio>1000 : 1 at single scanAfsoc Correctical SpecificationADC resolution16bit (0-65335)Minimum Integration TimeT msBarkSecond Order Blocking Filter InstalledFere Run ModeFree Run ModeTrigger ModeComputerComputerOptical Specification100-240V(47-63Hz), 1.5AComputer	Pixels	1024 X 58 pixels (Effective)	2048 X 122 pixels (Effective)	
Full Well Capacity300 Ke- (Vertical) 600 Ke- (Horizontal)70 Ke- (Vertical) 500 Ke- (Horizontal)Quantum Efficiency>90% @ 650nm90% or higher at peakOptical SpecificationWavelength RangeFull Range: ~200-1100nm UV/VIS Range: ~200-850nm Visible Range: ~380-760nmOptical Resolution~0.5-10nm, dependent on spectral range, slit width, and fiber diameterDarkAuto ShutterDark Noise RMSTYP <2 @Min. Integration Time	Pixel Size	24 um X 24 um	12 um X 12 um	
Full Well Capacity600 Ke- (Horizontal)500 Ke- (Horizontal)Quantum Efficiency>90% @ 650nm90% or higher at peakValue Section90% or higher at peakWavelength RangeFull Range: ~200-1100nmUV/VIS Range: ~200-850nmUV/VIS Range: ~200-850nmVisible Range: ~200-850nmUV/VIS Range: ~200-850nmOptical Resolution~0.5-10nm, dependent on spectral range, slit width, and fiber diameterDarkAuto ShutterDarkAuto ShutterDark Noise RMSTYP <2 @Min. Integration Time	Active Area	24.576 mm X 1.392 mm	24.576 mm X 1.464 mm	
Quantum Efficiency500 Ke- (Horizontal)500 Ke- (Horizontal)Quantum Efficiency>90% @ 650nm90% or higher at peakOptical SpecificationWavelength RangeFull Range: ~200-1100nmUV/VIS Range: ~200-850nmUV/VIS Range: ~200-850nmOptical Resolution~0.5-10nm, dependent on spectral range, slit width, and fiber diameterDarkAuto ShutterDarkAuto ShutterDarkAuto ShutterSignal to Noise RMSTYP <2 @Min. Integration Time	Full Well Capacity			
Optical Specification Wavelength Range Full Range: ~200-1100nm UV/VIS Range: ~200-850nm UV/VIS Range: ~200-850nm Optical Resolution Cother user customized ranges are available Optical Resolution ~0.5-10nm, dependent on spectral range, slit width, and fiber diameter Dark Auto Shutter Dark Noise RMS TYP <2 @Min. Integration Time		, <i>,</i>		
Full Range: ~200-1100nmUV/VIS Range: ~200-850nmVisible Range: ~380-760nmOther user customized ranges are availableOptical Resolution~0.5-10nm, dependent on spectral rarge, slit width, and fiber diameterDarkAuto ShutterDark Noise RMSTYP <2 @Min. Integration Time	Quantum Efficiency	-	90% or higher at peak	
Wavelength RangeUV/VIS Range: ~200-850nm Visible Range: ~380-760nm Other user customized ranges are availableOptical Resolution~0.5-10nm, dependent on spectral range, slit width, and fiber diameterDarkAuto ShutterDark Noise RMSTYP <2 @Min. Integration Time				
Wavelength RangeVisible Range: ~380-760nm Other user customized ranges are availableOptical Resolution~0.5-10nm, dependent on spectral range, slit width, and fiber diameterDarkAuto ShutterDarkAuto ShutterDark Noise RMSTYP <2 @Min. Integration Time		-		
Visible Range: "380-760nm Other user customized ranges are availableOptical Resolution~0.5-10nm, dependent on spectral range, slit width, and fiber diameterDarkAuto ShutterDark Noise RMSTYP <2 @Min. Integration Time	Wavelength Range			
Optical Resolution~0.5-10nm, dependent on spectral range, slit width, and fiber diameterDarkAuto ShutterDark Noise RMSTYP <2 @Min. Integration Time	5 5			
DarkAuto ShutterDark Noise RMSTYP <2 @Min. Integration Time	Other user customized ranges are available			
Dark Noise RMSTYP <2 @Min. Integration TimeTYP <7 @Min. Integration TimeSignal to Noise Ratio>1000 : 1 at single scan>450 : 1 at single scanStray Light<0.05% AVG	Optical Resolution	\sim 0.5-10nm, dependent on spectral range, slit width, and fiber diameter		
Signal to Noise Ratio>1000 : 1 at single scan>450 : 1 at single scanStray Light<0.05% AVG	Dark	Auto Shutter		
Stray Light<0.05% AVGFilterSecond Order Blocking Filter InstalledElectrical SpecificationADC resolution16bit (0-65535)Minimum Integration Time7 ms8 msComputer InterfaceUSB 1.1/2.0 CompatibleFree Run ModeFree Run ModeTrigger ModeSoftware Trigger ModeExternal trigger mode (20-pin connector): TTL Edge trigger inputPower Input100-240V(47-63Hz), 1.5AComputerOperating SystemWindows XP/Windows VISTA/Win 7/Win 8.1/Win 10 (32/64 bit)SoftwareSM32Pro (basic) & SMProMX (advanced)	Dark Noise RMS	TYP <2 @Min. Integration Time	TYP <7 @Min. Integration Time	
Filter Second Order Blocking Filter Installed Electrical Specification ADC resolution 16bit (0-65535) Minimum Integration Time 7 ms 8 ms Computer Interface USB 1.1/2.0 Compatible Free Run Mode Free Run Mode Trigger Mode Software Trigger Mode External trigger mode (20-pin connector): TTL Edge trigger input Power Input 100-240V(47-63Hz), 1.5A Operating System Windows XP/Windows VISTA/Win 7/Win 8.1/Win 10 (32/64 bit) Software SM32Pro (basic) & SMProMX (advanced)	Signal to Noise Ratio	>1000 : 1 at single scan	>450 : 1 at single scan	
Electrical SpecificationADC resolution16bit (0-65535)Minimum Integration Time7 ms8 msComputer InterfaceUSB 1.1/2.0 CompatibleFree Run ModeFree Run ModeTrigger ModeSoftware Trigger ModeExternal trigger mode (20-pin connector): TTL Edge trigger inputPower Input100-240V(47-63Hz), 1.5AComputerOperating SystemWindows XP/Windows VISTA/Win 7/Win 8.1/Win 10 (32/64 bit)SoftwareSM32Pro (basic) & SMProMX (advanced)	Stray Light	<0.05% AVG		
ADC resolution16bit (0-65535)Minimum Integration Time7 ms8 msComputer InterfaceUSB 1.1/2.0 Compatible Free Run ModeFree Run ModeTrigger ModeSoftware Trigger ModeExternal trigger mode (20-pin connector): TTL Edge trigger inputPower Input100-240V(47-63Hz), 1.5AComputerOperating SystemWindows XP/Windows VISTA/Win 7/Win 8.1/Win 10 (32/64 bit)SoftwareSM32Pro (basic) & SMProMX (advanced)	Filter	Second Order Blocking Filter Installed		
Minimum Integration Time7 ms8 msComputer InterfaceUSB 1.1/2.0 Compatible Free Run ModeTrigger ModeSoftware Trigger ModeTrigger ModeExternal trigger mode (20-pin connector): TTL Edge trigger inputPower Input100-240V(47-63Hz), 1.5AComputerOperating SystemWindows XP/Windows VISTA/Win 7/Win 8.1/Win 10 (32/64 bit)SoftwareSM32Pro (basic) & SMProMX (advanced)	Electrical Specification			
Computer InterfaceUSB 1.1/2.0 CompatibleFree Run ModeTrigger ModeSoftware Trigger ModeExternal trigger mode (20-pin connector): TTL Edge trigger inputPower Input100-240V(47-63Hz), 1.5AComputerOperating SystemSoftwareSoftwareSoftwareSM32Pro (basic) & SMProMX (advanced)	ADC resolution	16bit (0-65535)		
Free Run ModeTrigger ModeSoftware Trigger ModeExternal trigger mode (20-pin connector): TTL Edge trigger inputPower Input100-240V(47-63Hz), 1.5AComputerOperating SystemSoftwareSM32Pro (basic) & SMProMX (advanced)	Minimum Integration Time	7 ms 8 ms		
Trigger ModeSoftware Trigger ModeExternal trigger mode (20-pin connector): TTL Edge trigger inputPower Input100-240V(47-63Hz), 1.5AComputerOperating SystemWindows XP/Windows VISTA/Win 7/Win 8.1/Win 10 (32/64 bit)SoftwareSM32Pro (basic) & SMProMX (advanced)	Computer Interface	USB 1.1/2.0 Compatible		
External trigger mode (20-pin connector): TTL Edge trigger input Power Input 100-240V(47-63Hz), 1.5A Computer Operating System Windows XP/Windows VISTA/Win 7/Win 8.1/Win 10 (32/64 bit) Software SM32Pro (basic) & SMProMX (advanced)		Free Run Mode		
Power Input100-240V(47-63Hz), 1.5AComputerOperating SystemWindows XP/Windows VISTA/Win 7/Win 8.1/Win 10 (32/64 bit)SoftwareSM32Pro (basic) & SMProMX (advanced)	Trigger Mode	Software Trigger Mode		
ComputerOperating SystemWindows XP/Windows VISTA/Win 7/Win 8.1/Win 10 (32/64 bit)SoftwareSM32Pro (basic) & SMProMX (advanced)		External trigger mode (20-pin connector): TTL Edge trigger input		
Operating SystemWindows XP/Windows VISTA/Win 7/Win 8.1/Win 10 (32/64 bit)SoftwareSM32Pro (basic) & SMProMX (advanced)	Power Input	100-240V(47-63Hz), 1.5A		
Software SM32Pro (basic) & SMProMX (advanced)	Computer			
Software SM32Pro (basic) & SMProMX (advanced)	Operating System	Windows XP/Windows VISTA/Win 7/	Win 8.1/Win 10 (32/64 bit)	
Software Development Kit Visual C#/C++ Lab//EW/ Matlab.atc	Software	SM32Pro (basic) & SMProMX (advanced)		
	Software Development Kit			

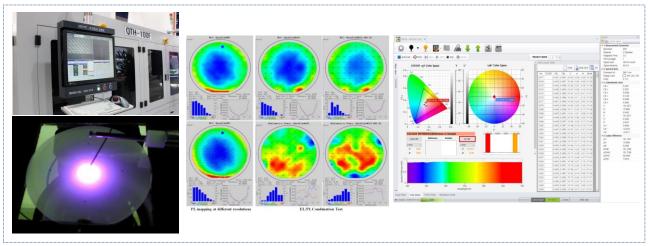
Low Spectrum Signal Detection with High Accuracy

Highly accurate optical monitoring and diagnostics of low spectrum intensity signals
Acquisition of stable time trends of intensity signals by help of internal TE(thermo-electric) cooling



Measurement of Photometric and Radiometric Values

- Quantitative measurement and analysis of photometric and radiometric values for light sources
- Optical Sensor of testers for real time monitoring and quality control for LED/OLED fabrication







Spectral Products

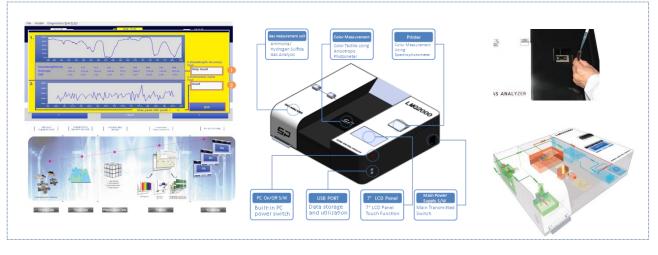
Raman Spectrum Analysis

- Highly sensitive and stable measurements of low intensity Raman scattering signals
- Customization for field usage in various scientific and industrial application

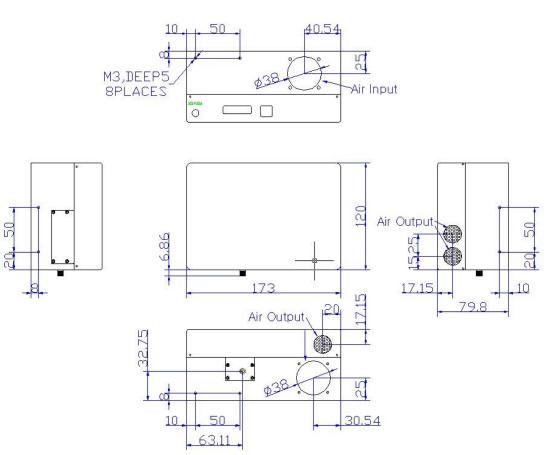
Real Time High Accuracy UV/V/IS Spectrophotometer

Real Time High Accuracy UV/VIS Spectrophotometer

- Real time high accurate measurement of transmission and absorbance of solid/liquid samples
- Convergence with gas detection sensors for environmental and agricultural monitoring purposes



Case Dimension:



Units in mm

Ordering Information : Please indicate product number plus description when ordering SM303 High Performance TE-Cooled Backthinned Spectrometer

SPECTRAL PRODUCTS