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# Spectroscopy Instruments



**Zolix**  
Zolix Instruments Co.,Ltd.

# Philosophy

*Growth Together, Success Forever*

## Objective

**World-Class Photonic Products & Systems Provider**

### About Zolix

Zolix Instruments CO., LTD (Zolix) is located in Beijing, the capital of China and designs spectrographs, light sources, detectors, optical components and optics-based solutions for the scientific research. We are proud of partnering with our customers to solve their most challenging problems in professional, unique, innovative ways

Established in 1999, Zolix has over many years of knowledge and expertise with broad range of technologies allowing the company to continually deliver innovative products in the areas of photonics instrumentation, optical components etc. In addition, Zolix has professional experience of partnering with OEM customers, delivering solutions including design, testing and manufacturing.

### About products

Zolix has strong core technologies with patent in scientific instruments. Many technical engineers engaged in the R&D and production, kinds of successful international cooperation cases. The powerful technical strength ensures the possibility to serve the customers complete solutions.

### Certificates

Zolix is ISO9001, LVD, CE, RoSH certified

**The Zolix employees & Distributors all over the world, are looking forward to working with you and providing the best scientific solution for your needs !**



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# Spectroscopy Instruments



Spectroscopy instruments include Spectrographs, Monochromators, Light Source and Components, detectors, data collection systems, sample chamber, motorized filter wheel, motorized slit, fiber and fiber adapter.

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# Omni Spectrographs

## Omni- $\lambda$ Monochromators and Spectrographs



Omni- $\lambda$  Series of imaging spectrographs and monochromators from Zolix Instruments are profession standard for researchers who demand the highest quality data. Zolix spectrographs and monochromators feature a very flexible design that can be configured for a wide range of applications & spectral range from UV to NIR.

- 200mm, 320 mm, 500 mm, 750 mm focal length
- Our rugged Czerny-Turner spectrographs come pre-aligned and pre-calibrated for ease of operation.
- Interchangeable triple grating turret– Different wavelength ranges and resolutions, Provide a simple, accurate and convenient way for the user to change gratings within the spectrograph unit
- These instruments can be integrated with single point detectors, InGaAs cameras and CCDs to offer a versatile, most sensitive modular solution for different applications ;
- Accessories including filter wheels, fiber adapters, shutters, motorized slits, sample chambers etc.
- Software can complete data acquisition for detectors including single point detectors and CCD.
- Labview driver for programming to operate Omni- $\lambda$  Series spectrographs and monochromators.

### Omni- $\lambda$ Specifications(@1200g/mm\* )

	Omni- $\lambda$ 200i	Omni- $\lambda$ 300i	Omni- $\lambda$ 500i	Omni- $\lambda$ 750i
Focal Length (mm)	200	320	500	750
Aperture Ratios	f/3.5	f/4.2	f/6.5	f/9.7
Resolution(nm)-PMT*	0.15	0.08	0.046	0.028
Resolution(nm)-CCD(26 $\mu$ m) *	0.28	0.174	0.15	0.09
Dispersion (nm/mm) *	3.6	2.3	1.7	1.1
Wavelength Accuracy(nm)	$\pm 0.2$	$\pm 0.2$	$\pm 0.15$	$\pm 0.1$
Wavelength Repeatability (nm)	$\pm 0.1$	$\pm 0.1$	$\pm 0.08$	$\pm 0.01$
Step (nm)	0.01	0.005	0.005	0.0025
Stray Light	$1 \times 10^{-5}$	$1 \times 10^{-5}$	$1 \times 10^{-5}$	$1 \times 10^{-5}$
Focal Plane Size (mm)	30(w) $\times$ 14(h)	30(w) $\times$ 14(h)	30(w) $\times$ 14(h)	30(w) $\times$ 14(h)
Optical Axis Height(mm)	146	146	146	146
Slit	Width: 0.01-3mm(Motorised or manual slit), Height: 2、 4、 14 mm, height selectable			
Grating Size(mm)	50 $\times$ 50	68 $\times$ 68	68 $\times$ 68	68 $\times$ 68
Grating Mount	Dual grating turret	Interchangeable triple grating turret	Interchangeable triple grating turret	Interchangeable triple grating turret
Computer Interface	USB2.0	USB2.0 and RS232	USB2.0 and RS232	USB2.0 and RS232
Size (mm)	300 $\times$ 216 $\times$ 213	420 $\times$ 295 $\times$ 232	550 $\times$ 288 $\times$ 220	800 $\times$ 338 $\times$ 218
Weight (Kg)	14	16	22	32.5

- Dispersion measured with 1200g/mm grating @ 435.8nm
- PMT resolution measured with 1200g/mm @ 435.8nm, 10 $\mu$ m slit width and 4mm slit height
- CCD resolution measured with 1200g/mm @ 435.8nm, 10 $\mu$ m slit width and 26 $\mu$ m pixel



### Omni-λ spectrographs named views

Omni-λXX

Y

Z(i)

20: 200 mm focal length

30: 320 mm focal length

50: 500 mm focal length

75: 750 mm focal length

0: Standard (Side entrance, protected Al coated grating and mirror)

1: IR (Protected gold coated)

2: Dual slit entrances

3: IR & Dual slit entrances

4: UV

5: UV & Dual slit entrances

6: Protected silver coated

7: Protected silver coated & Dual slit entrances

3: Slit front exit, CCD side exit

4: Dual CCD exits

5: Slit front exit

6: CCD front exit

7: Dual slit exits

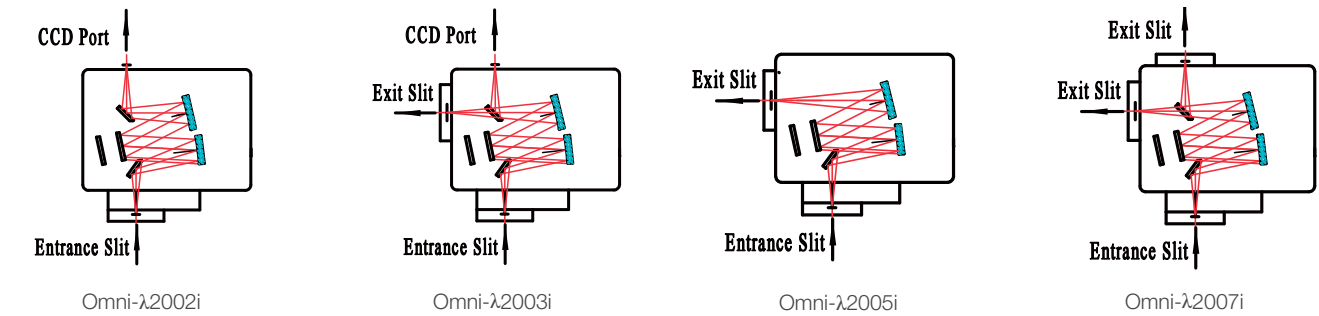
8: CCD front exit, slit side exit

9: Slit side exit

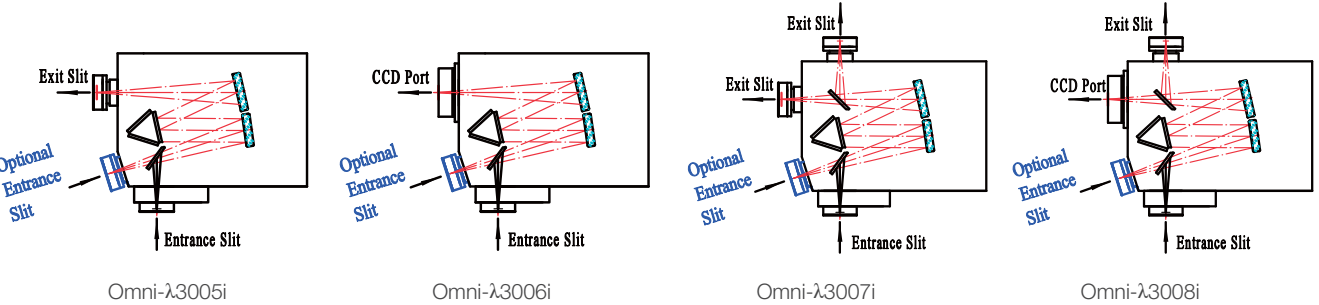
e.g Omni-λ3047, side entrance, slit front exit, slit side exit, support 3 gratings simultaneously, UV monochromator.

### Optical Configuration

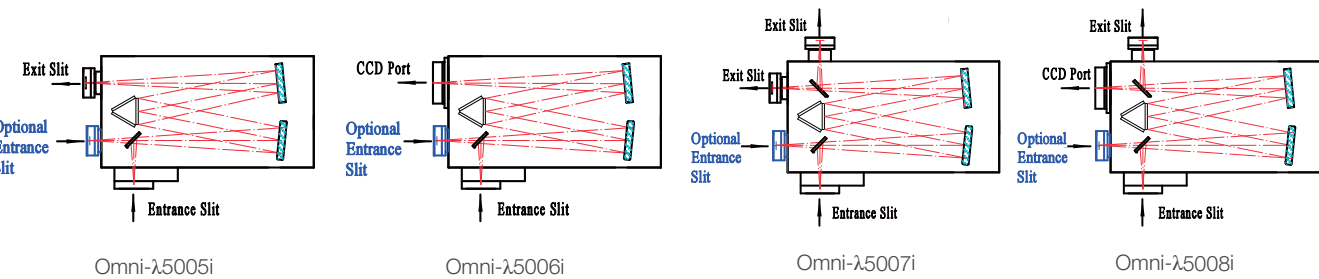
#### Omni-λ200i Monochromator/Spectrograph



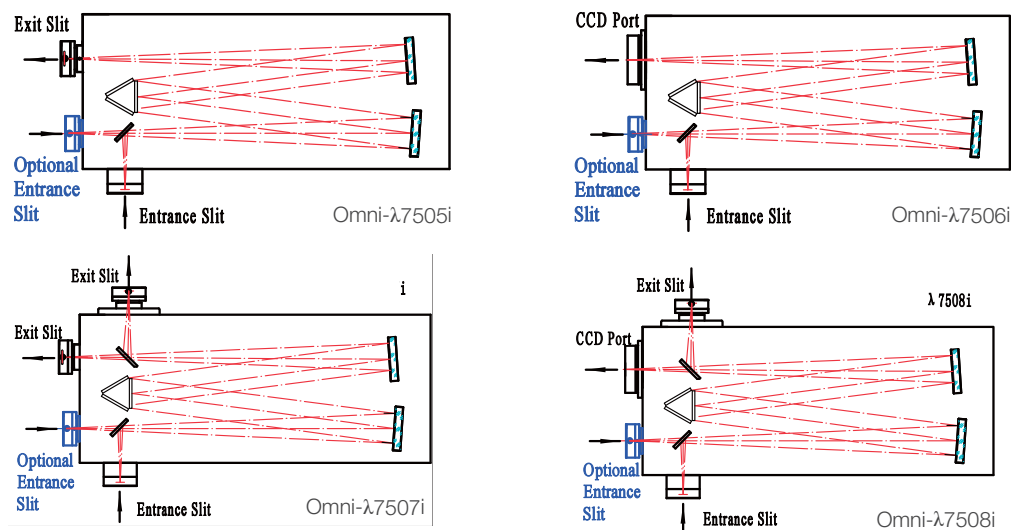
#### Omni-λ300i Monochromator/Spectrograph



#### Omni-λ500i Monochromator/Spectrograph



## Omni-λ750i Monochromator/ Spectrograph



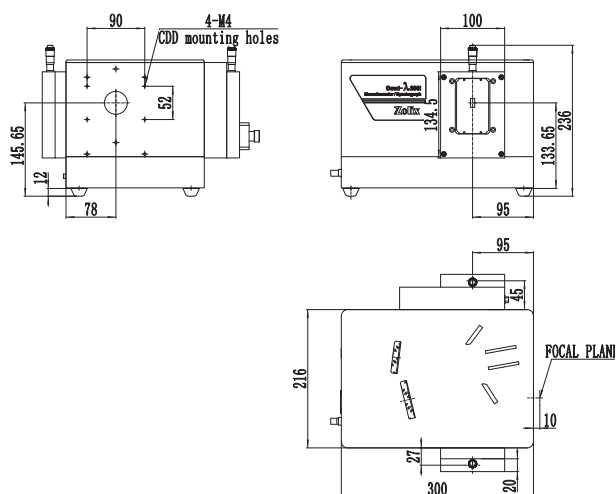
Note: the second entrance is the optional (blue).

## Omni-λ Selections

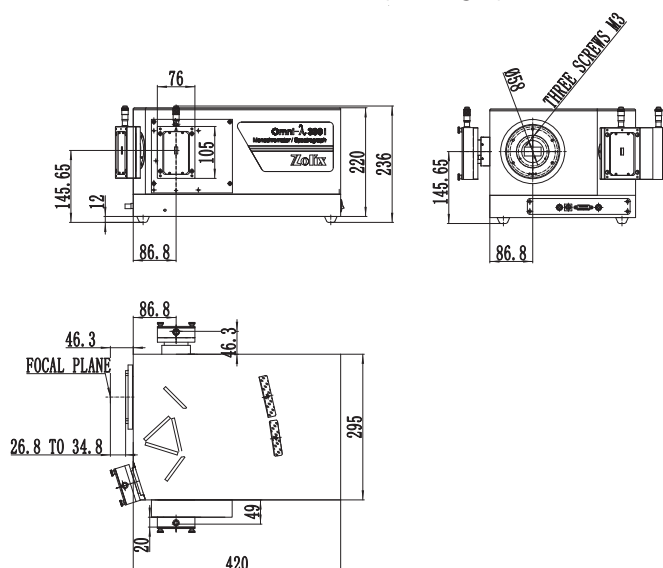
Model	Description
<b>Omni-λ200i series Monochromator(200 mm focal length, support 2 gratings simultaneously)</b>	
Omni-λ2003i	side entrance, slit front exit, CCD side exit, support 2 gratings simultaneously
Omni-λ2002i	side entrance, CCD side exit, support 2 gratings simultaneously
Omni-λ2005i	side entrance, slit front exit, support 2 gratings simultaneously
Omni-λ2007i	side entrance, slit front exit, slit side exit, support 2 gratings simultaneously
<b>Omni-λ300i series Monochromator/ spectrograph(320 mm focal length, support 3 gratings simultaneously)</b>	
Omni-λ3005i	side entrance, slit front exit, support 3 gratings simultaneously
Omni-λ3007i	side entrance, slit front exit, slit side exit, support 3 gratings simultaneously
Omni-λ3008i	side entrance, CCD front exit, slit side exit, support 3 gratings simultaneously
Omni-λ3004i	side entrance, CCD front exit, CCD side exit, support 3 gratings simultaneously
Omni-λ3015i	side entrance, slit front exit, support 3 gratings simultaneously, IR monochromator,
Omni-λ3017i	side entrance, slit front exit, slit side exit, support 3 gratings simultaneously, IR monochromator
Omni-λ3027i	Dual entrances, slit front exit, slit side exit, support 3 gratings simultaneously
Omni-λ3028i	Dual entrances, CCD front exit, slit side exit, support 3 gratings simultaneously
Omni-λ3024i	Dual entrances, CCD front exit, CCD side exit, support 3 gratings simultaneously
Omni-λ3047i	side entrance, slit front exit, slit side exit, support 3 gratings simultaneously, UV monochromator
Omni-λ3048i	side entrance, CCD front exit, slit side exit, support 3 gratings simultaneously, UV monochromator
Omni-λ3044i	side entrance, CCD front exit, CCD side exit, support 3 gratings simultaneously, UV monochromator
<b>Omni-λ500i series Monochromator/ spectrograph (500 mm focal length, support 3 gratings simultaneously)</b>	
Omni-λ5005i	side entrance, slit front exit, support 3 gratings simultaneously
Omni-λ5007i	side entrance, slit front exit, slit side exit, support 3 gratings simultaneously
Omni-λ5008i	side entrance, CCD front exit, slit side exit, support 3 gratings simultaneously
Omni-λ5004i	side entrance, CCD front exit, CCD side exit, support 3 gratings simultaneously
Omni-λ5015i	side entrance, slit front exit, support 3 gratings simultaneously, IR monochromator,
Omni-λ5017i	side entrance, slit front exit, slit side exit, support 3 gratings simultaneously, IR monochromator
Omni-λ5027i	Dual entrances, slit front exit, slit side exit, support 3 gratings simultaneously
Omni-λ5028i	Dual entrances, CCD front exit, slit side exit, support 3 gratings simultaneously
Omni-λ5024i	Dual entrances, CCD front exit, CCD side exit, support 3 gratings simultaneously
Omni-λ5047i	side entrance, slit front exit, slit side exit, support 3 gratings simultaneously, UV monochromator
Omni-λ5048i	side entrance, CCD front exit, slit side exit, support 3 gratings simultaneously, UV monochromator
Omni-λ5044i	side entrance, CCD front exit, CCD side exit, support 3 gratings simultaneously, UV monochromator
<b>Omni-λ750 series Monochromator/ spectrograph (750 mm focal length, support 3 gratings simultaneously)</b>	
Omni-λ7505i	side entrance, slit front exit, support 3 gratings simultaneously
Omni-λ7507i	side entrance, slit front exit, slit side exit, support 3 gratings simultaneously
Omni-λ7508i	side entrance, CCD front exit, slit side exit, support 3 gratings simultaneously
Omni-λ7504i	side entrance, CCD front exit, CCD side exit, support 3 gratings simultaneously
Omni-λ7515i	side entrance, slit front exit, support 3 gratings simultaneously, IR monochromator,
Omni-λ7517i	side entrance, slit front exit, slit side exit, support 3 gratings simultaneously, IR monochromator

## Omni-λ Drawings

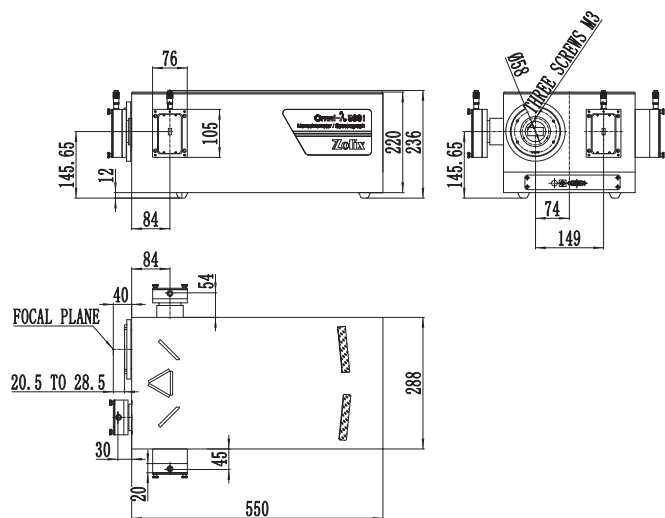
Omni-λ200i Monochromator/Spectrograph



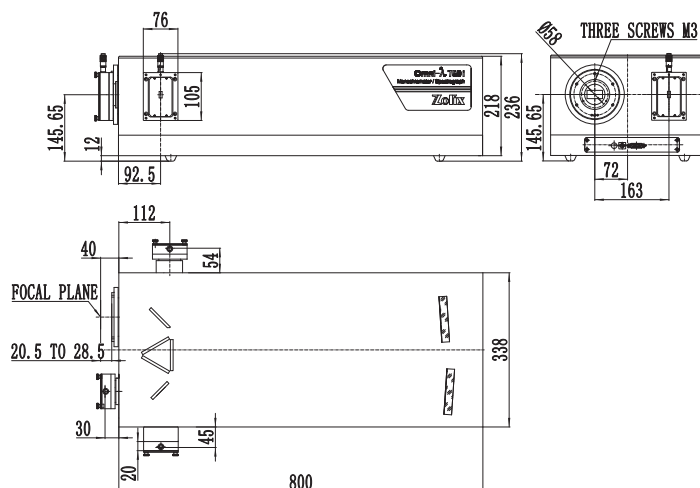
Omni-λ300i Monochromator/Spectrograph



Omni-λ500i Monochromator/Spectrograph

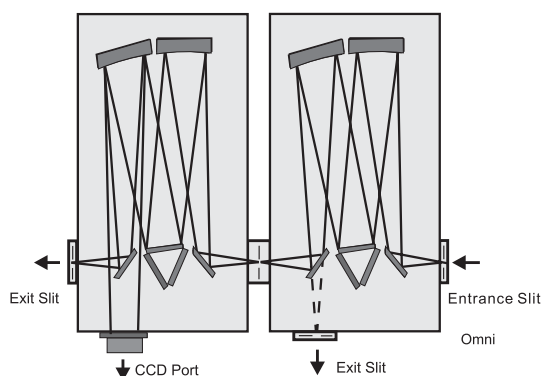


Omni-λ750i Monochromator/Spectrograph





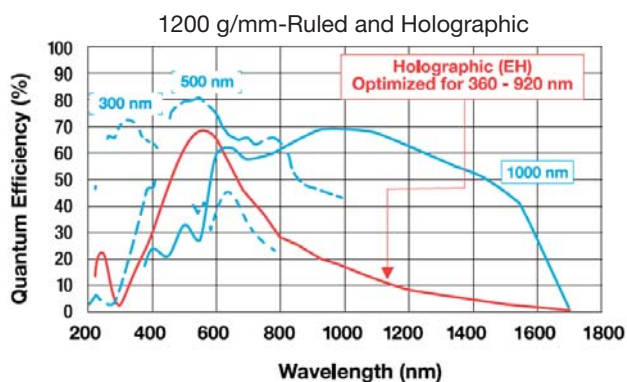
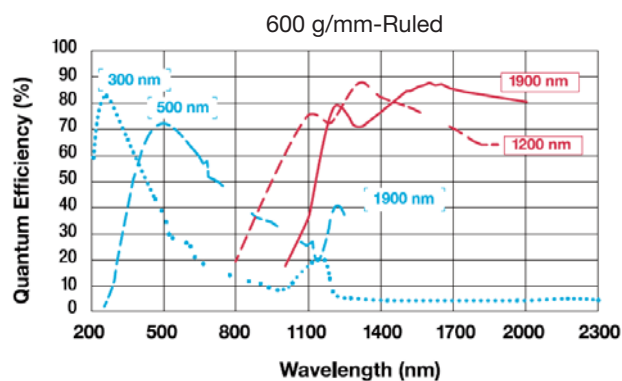
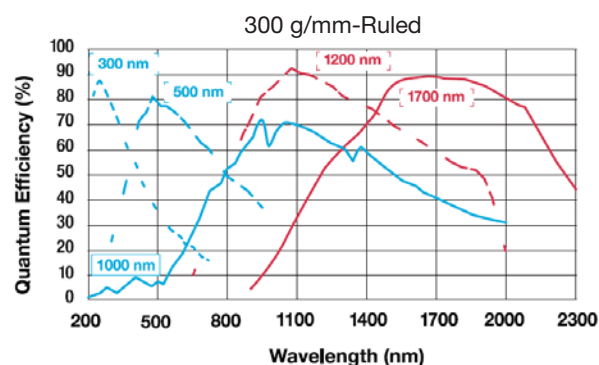
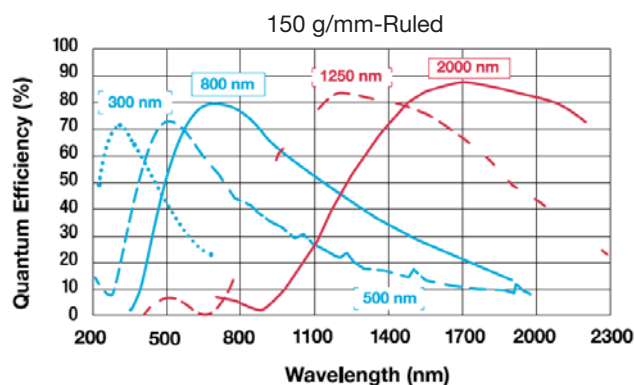
## Omni- $\lambda$ xxxD Double Monochromators/Spectrographs



The Double Monochromators/Spectrographs include two 320mm focus monochromators( or 500 mm, 750 mm focus) which are with fine alignment. Double Monochromator has the dispersion subtraction mode and dispersion sum mode. Using dispersion sum mode, the double monochromator/spectrograph spectral resolution can be doubled, suitable for high resolution measurement. Using dispersion subtraction mode, the double monochromator/spectrograph stray light can be reduced effectively, suitable for weaker signal detection, such as Raman spectral measurement.

Please contact us if you need specification !

### Grating Curves



# Gratings

The green models are used commonly as we suggested

Model	Range(nm)	Grooves(g/mm)	Blaze(nm)	Size(mm)
<b>Holographic</b>				
1-360-180-500-NP	180-400	3600	300	68 x 68
1-240-250-600-NP	250-600	2400	300	68 x 68
1-240-190-800-NP	190-600	2400	250	68 x 68
1-200-300-900-NP	300-720	2000	475	68 x 68
1-180-350-900-NP	350-800	1800	500	68 x 68
1-180-190-900-NP	190-800	1800	250	68 x 68
1-120-190-800-NP	190-800	1201.6	250	68 x 68
1-120-400-1200-NP	400-1200	1200	700	68 x 68
<b>Ruled</b>				
1-240-240-NP	190-600	2400	240	68 x 68
1-240-300-NP	250-600	2400	300	68 x 68
1-180-400-NP	300-800	1800	400	68 x 68
1-180-500-NP	350-800	1800	500	68 x 68
1-120-250-NP	200-500	1200	250	68 x 68
1-120-300-NP	200-600	1200	300	68 x 68
1-120-400-NP	200-1000	1200	400	68 x 68
1-120-500-NP	350-1100	1200	500	68 x 68
1-120-750-NP	500-1200	1200	750	68 x 68
1-090-550-NP	350-1600	900	550	68 x 68
1-083-1200-NP	700-1700	830	1200	68 x 68
1-060-300-NP	200-600	600	300	68 x 68
1-060-500-NP	330-1000	600	500	68 x 68
1-060-750-NP	500-1500	600	750	68 x 68
1-060-1000-NP	650-2200	600	1.0 $\mu\text{m}$	68 x 68
1-060-1200-NP	800-2400	600	1.2 $\mu\text{m}$	68 x 68
1-060-1600-NP	1-2.4 $\mu\text{m}$	600	1.6 $\mu\text{m}$	68 x 68
1-030-300-NP	200-600	300	300	68 x 68
1-030-500-NP	300-1000	300	500	68 x 68
1-030-760-NP	450-1500	300	760	68 x 68
1-030-1000-NP	600-2000	300	1000	68 x 68
1-030-1200-NP	800-2200	300	1200	68 x 68
1-030-2000-NP	1.4-4 $\mu\text{m}$	300	2.0 $\mu\text{m}$	68 x 68
1-030-3000-NP	2-4.8 $\mu\text{m}$	300	3.0 $\mu\text{m}$	68 x 68
1-015-300-NP	200-600	150	300	68 x 68
1-015-500-NP	330-1100	150	500	68 x 68
1-015-800-NP	400-1600	150	800	68 x 68
1-015-1000-NP	600-2000	150	1090	68 x 68
1-015-1250-NP	800-2500	150	1250	68 x 68
1-015-2000-NP	1.1-4 $\mu\text{m}$	150	2 $\mu\text{m}$	68 x 68
1-015-3000-NP	2.2-4 $\mu\text{m}$	150	3 $\mu\text{m}$	68 x 68
1-015-4000-NP	2.5-8 $\mu\text{m}$	150	4 $\mu\text{m}$	68 x 68
1-0075-8000-NP	6-16 $\mu\text{m}$	75	8 $\mu\text{m}$	68 x 68
1-0075-10000-NP	6-18 $\mu\text{m}$	75	10 $\mu\text{m}$	68 x 68
1-0075-12000-NP	9-20 $\mu\text{m}$	75	12.0 $\mu\text{m}$	68 x 68
1-0050-12000-NP	8-22 $\mu\text{m}$	50	12 $\mu\text{m}$	68 x 68

## Dispersion and Wavelength Coverage

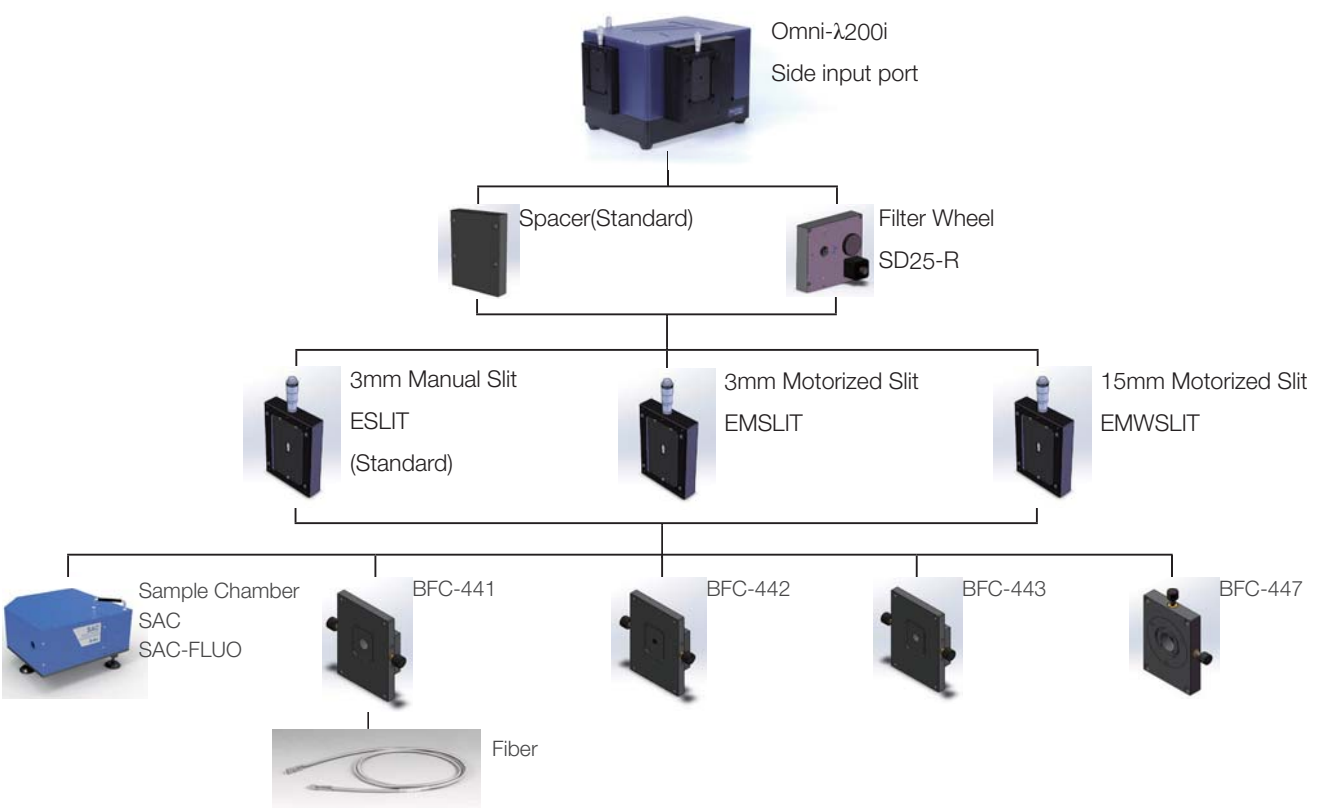
Model	Grating (g/mm)	Dispersion* (nm/mm)	Spectrometer Mechanical Range (nm)	CCD Resolution with 13.5um pixels (nm)	PMT Resolution (nm)	Spectral Coverage with 30mm CCD (nm)
Omni-λ200i	3600	1	0 to 400	0.1	0.05	30
	2400	1.4	0 to 600	0.14	0.08	42
	1800	2.16	0 to 800	0.2	0.1	64
	1200	3.6	0 to 1200	0.28	0.15	108
	900	4.96	0 to 1600	0.4	0.2	148
	600	7.68	0 to 2400	0.56	0.3	230
	300	15.77	0 to 4800	1.12	0.6	473
	150	31.89	0 to 9600	2.24	1.2	956
Omni-λ300i	3600	0.66	0 to 400	0.058	0.03	20
	2400	0.91	0 to 600	0.087	0.04	27
	1800	1.39	0 to 800	0.116	0.05	42
	1200	2.28	0 to 1200	0.174	0.08	68
	900	3.16	0 to 1600	0.232	0.11	95
	600	4.87	0 to 2400	0.348	0.16	146
	300	9.97	0 to 4800	0.696	0.32	299
	150	20.13	0 to 9600	1.392	0.64	604
Omni-λ500i	3600	0.43	0 to 400	0.033	0.02	13
	2400	0.6	0 to 600	0.050	0.03	18
	1800	0.91	0 to 800	0.067	0.04	27
	1200	1.5	0 to 1200	0.100	0.05	45
	900	2	0 to 1600	0.133	0.07	60
	600	3.15	0 to 2400	0.200	0.10	95
	300	6.43	0 to 4800	0.400	0.20	193
	150	12.97	0 to 9600	0.800	0.40	389
Omni-λ750i	3600	0.3	0 to 400	0.022	0.01	9
	2400	0.43	0 to 600	0.034	0.02	13
	1800	0.64	0 to 800	0.045	0.02	19
	1200	1	0 to 1200	0.067	0.03	30
	900	1.4	0 to 1600	0.089	0.04	42
	600	2.14	0 to 2400	0.134	0.06	64
	300	4.36	0 to 4800	0.268	0.12	131
	150	8.77	0 to 9600	0.536	0.24	263

"★ Center Wavelength of 253.65 nm used with 3600 g/mm grating Center Wavelength of 435.833 nm used with all other gratings Dispersion may vary at different wavelengths"

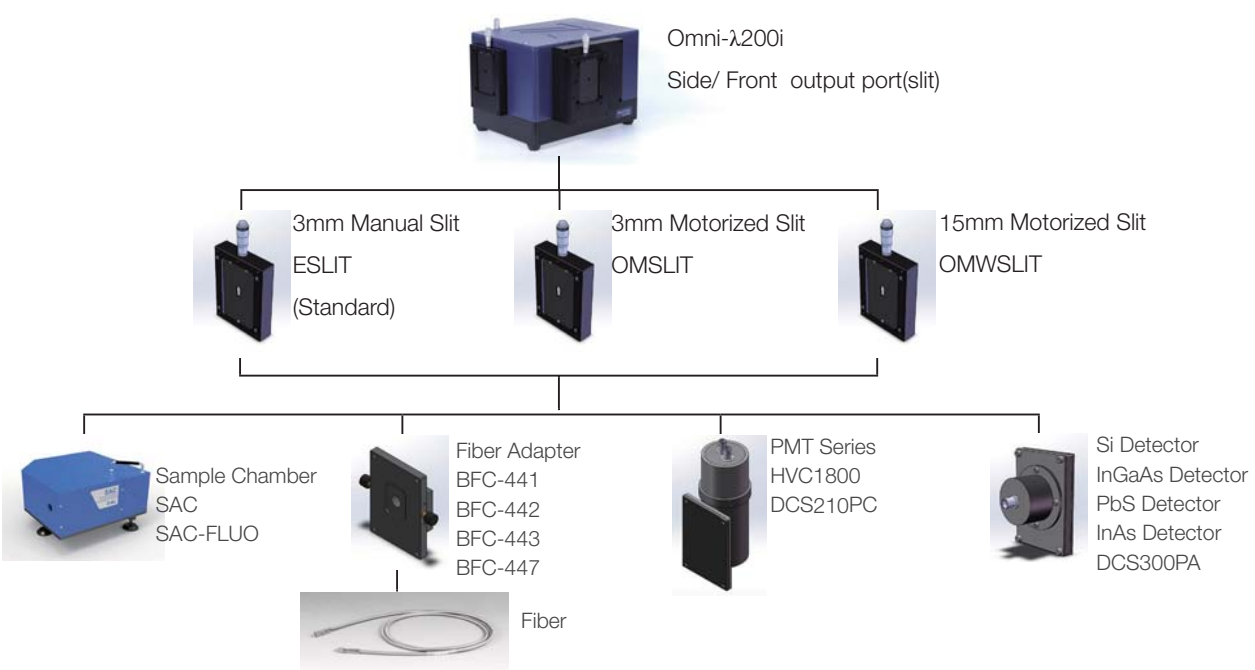
☆ Spectral range will depend not only on Mechanical Range, but also the grating Blaze Wavelength

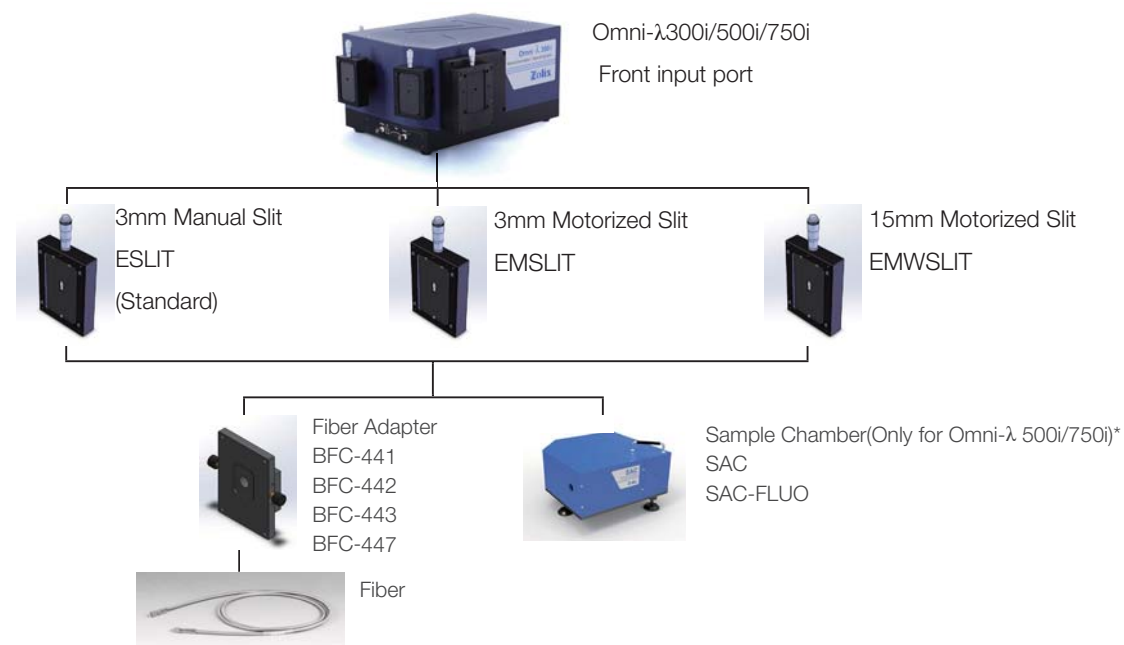
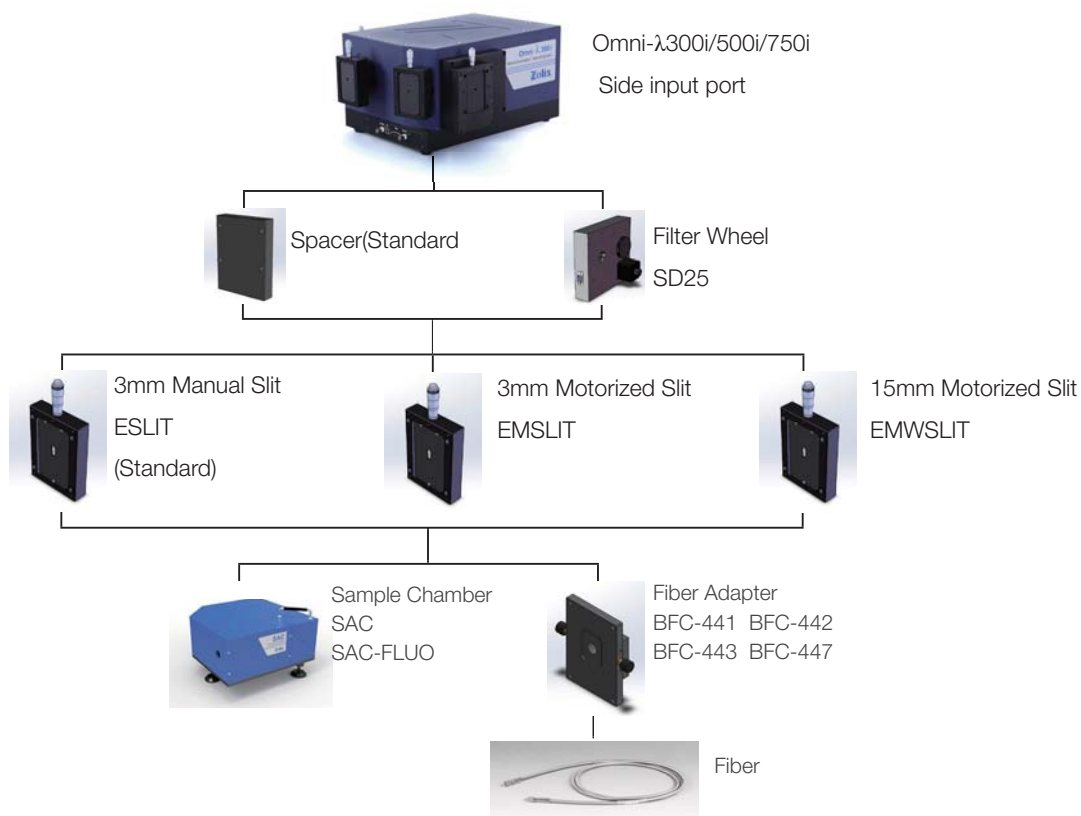
◆ Listed Resolution values are not at the same wavelength, the specified wavelength is close to blaze wavelength

## Omni-λ200i Input Port



## Omni-λ200i Output Port

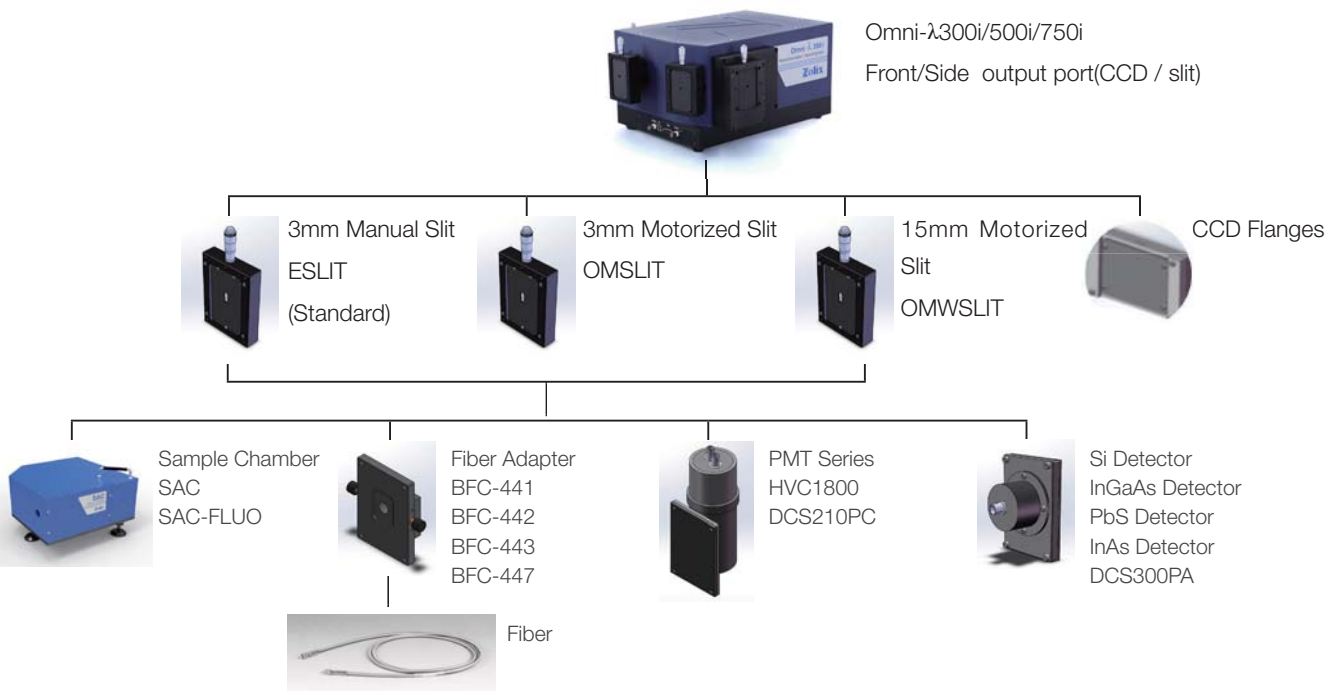


Omni- $\lambda$ 300i/500i/750i Input Port



# Omni-λ300i/500i/750i Output Port

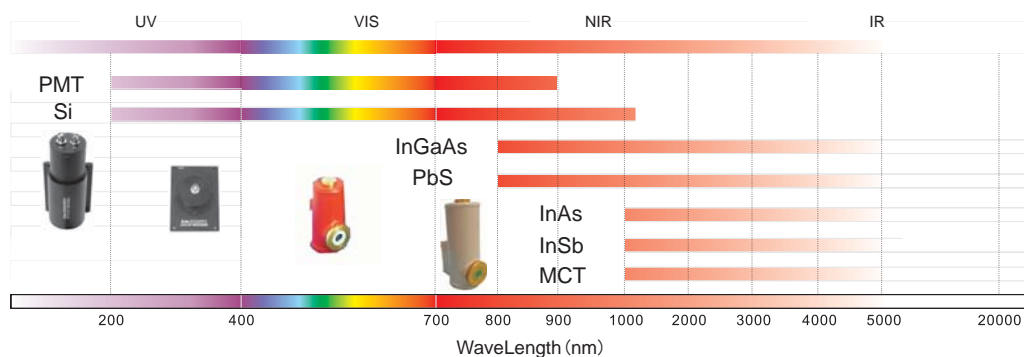
Omni spectrographs




# Detectors

Zolix offers a range of single channel detector (PMT and solid detectors) which can be connected well with Zolix monochromator and accessories for spectrometers, spectral coverage is UV-VIS-IR spectrum.

- Room temperature PMT, spectral range: 200nm-900nm (1010nm, 1200nm)
- UV-enhanced, high sensitivity Si photodetector, spectral range: 200-1100nm
- Room temperature, TE cooled InGaAs IR detectors, spectral range: 0.8-2.6 $\mu$ m
- Room temperature PbS IR detectors, spectral range: 0.8-3.2 $\mu$ m
- Room temperature, TE cooled InAs IR detectors, spectral range: 1-3.8 $\mu$ m
- Liquid nitrogen cooled InSb IR detectors, spectral range: 1-5.5 $\mu$ m
- Liquid nitrogen cooled, high speed response InSb IR detectors, pre-amplifier, response time:<25ns, spectral range: 1-5.5 $\mu$ m.
- TE cooled, liquid nitrogen cooled HgCdTe mid and far IR detectors, spectral range: 1-5.5 $\mu$ m
- Liquid nitrogen cooled, high speed response HgCdTe mid and far IR detectors, pre-amplifier, response time:<50ns, spectral range:1-12 $\mu$ m

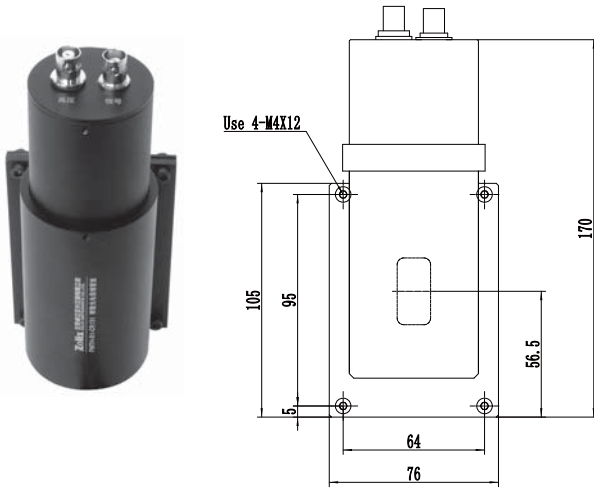


## Detector Selections

	PMTH-S1-xx	Si	InGaAs	PbS3200	InAs
Detector					
Wavelength (nm)	185-900	200-1100	800-2600	800-3200	1000-3800
Effective Area (mm)	8*24	ø11.28	ø3	6*6	ø2
Cooling	Room temperature	Room temperature	-40°C TE	Room temperature	-40°C TE
Mode	Current	Current	Current	Voltage	Current
Note	HVC1800(HV power supply)		ZTC		ZTC

# Single Channel Detector

## PMTH-S1-(x) Detectors



- Design to meet high sensitivity high measurement in the spectral range: 200-1100nm
- Light tight integrating housing
- Matched to Omni-λ series
- Wide range of accessories, including high voltage power supply

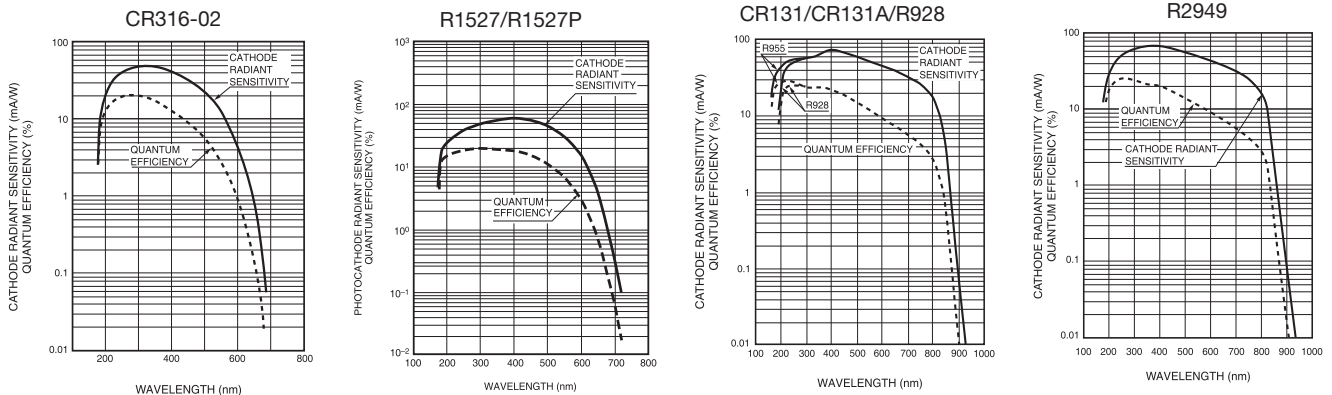
### Side window photomultiplier tubes

- Side window, with electromagnetic and optical shielding.
- Match well with Zolix spectrograph, sample chamber.
- Output signal through a standard BNC.
- Stable high-voltage input through a dedicated high pressure resistance BNC.
- A variety of models side-windows photomultiplier tubes can be built-in.
- Current output
- Voltage output as option
- Recommended with the high-voltage power supply.

### Specifications:

	CR316-02	R1527	R1527P	CR131	CR131A	R928	R2949
Spectral Response (nm)	185-650	185-680		185-900			185-900
Wavelength of Maximum Response (nm)	340	400	400±30nm			400±30	
Cathode Sensitivity (wavelength, mA/W)	48	60	74			68	
Dynode Gain	1.0×10 <sup>7</sup>	6.7×10 <sup>6</sup>		1.0×10 <sup>7</sup>			
Cathode Luminous Sensitivity (μA/Lm)	40	60	140	250	200		
Anode Luminous Sensitivity (A/Lm)	400			1000	1500	2500	2000
Anode Dark Current (Typ., nA)	5	0.1	3	2			
Anode Dark Current (Max., nA)	15	2	0.5	50	25		
Dark Count (Typ.,cps@25℃)	-	-	10	-	-	-	300
Dark Count (Max.,cps@25℃)	-	-	50	-	-	-	500
Photocathode Material	Sb-Cs	Dualalkali		Multialkali			
Effective Area (mm)	8×24						8×6
Dynode Structure	Circular-cage, Number of Stages: 9						
Anode Pulse Rise Time (ns)	2.2						
Electron Transit Time (ns)	22						
Supply Voltage between Anode and Cathode (V)	1250						
Supply Voltage between Anode and Last Dynode (V)	250						

### Spectral response curve and quantum



## HVC1800 High Voltage Power Supply



High voltage power supply provides stable DC high voltage for the photomultiplier tubes. With the HVC1800, the photomultiplier tubes are well suited for use in various low-level photometries such as general single photon counting applications.

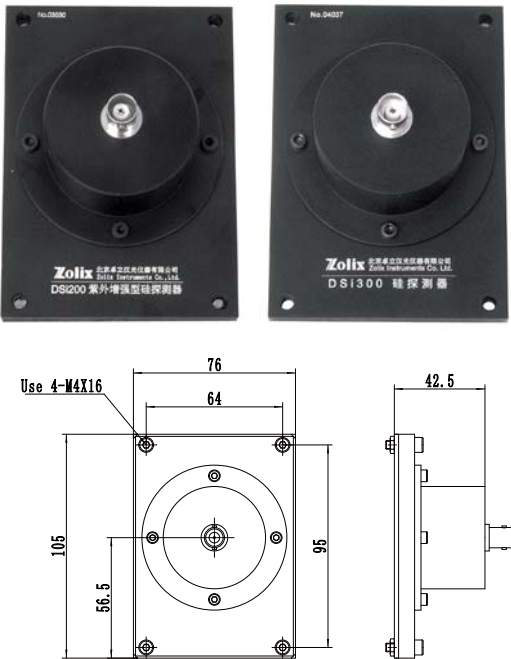
- Output voltage: 0-1500 V, DC negative voltage.
- Output voltage can be changed manually; also available through an external control port (0-10 V) by PC, or D/A converter (such as DCS300PA).
- Maximum Output Current: 0.5mA
- Maximum output voltage drift:  $\pm 0.05\%/h$
- 3 1/2 digits LED numeric display
- Size: 240mmx240mmx120mm
- Weight: 3.4kg

### Selections

Model	Description	Signal Polarity
PMTH-S1-CR316-02	Photomultiplier tube (185-650nm)	Negative
PMTH-S1-R1527	Photomultiplier tube (185-670nm), high sensitivity, current output mode (blue)	Negative
PMTH-S1-R1527P	Photomultiplier tube (185-670nm), high sensitivity, low dark counts, current output mode (blue)	Negative
PMTH-S1-CR131	Photomultiplier tube (185-900nm), ordinary, current output mode (red)	Negative
PMTH-S1-CR131A	Photomultiplier tube (185-900nm), high sensitivity, current output mode (red)	Negative
PMTH-S1-R928	Photomultiplier tube (185-900nm), ordinary, current output mode (red)	Negative
PMTH-S1-R2949	Photomultiplier tube (185-900nm), high sensitivity, low dark counts, current output mode (red)	Negative

High Voltage Power Supply	Description	Output Voltage Polarity
HVC1800	High voltage power supply (0-1500 V)	Negative

DSi200/300 Silicon Detectors



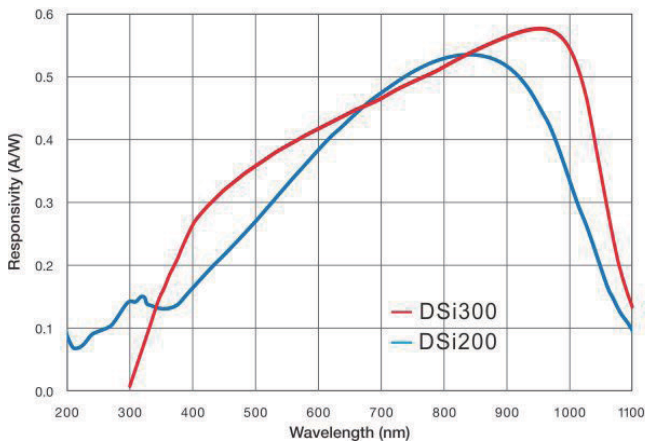
Both are enclosed in a housing with BNC signal connector, and include mounting flanges for the direct mounting on the slit assembly of Omni-λ series monochromators. I-V amplifier ZAMP is recommended for the signal conversion

Silicon photodetector application advices:

- DSi200/DSi300 are both current output modes, before connecting to the signal processors such as oscilloscope or lock-in amplifier, the IV Trans-impedance Amplifier ZAMP is proposed to be connected as a preamp and which can convert the current signal to voltage signal.
- If the signal processor indicates that it can be input current signal, you can connect the detectors to the signal processors directly. In order to improve the detection sensitivity, the IV Trans-impedance Amplifier is recommended.
- DSi200/DSi300 used with the DCS103 data acquisition system, the IV Trans-impedance Amplifier is recommended in order to improve the detection sensitivity.
- DSi200/DSi300 used with the DCS300PA data acquisition system, as signal amplifier has been integrated in the DCS300PA dual channel, it does not need to match pre-amplifier.

Silicon photodiode detectors are a rugged standard detector for applications that have good collected light levels.

- DSi200 is UV enhanced for operation from 200-1100 nm, built-in UV sensitive Si photodetector
- DSi300 is general purpose detector for 300-1100 nm

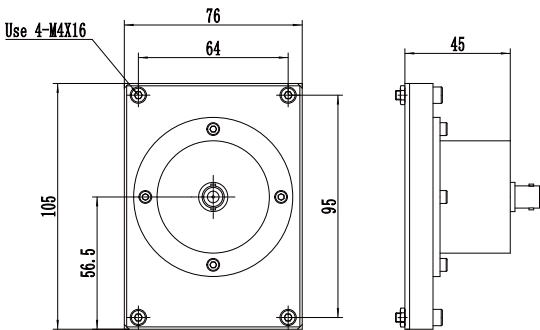


Mode	DSi200	DSi 300
	UV enhanced	Blue enhanced
Effective Area(mm <sup>2</sup> )	100 ( ø11.28)	100 ( ø11.28)
Spectral Range(nm)	200-1100	350-1100
Peak Wavelength(nm)	820	970
Peak Responsivity(A/W)	0.52	0.60(>0.55)
Response(A/W)	0.14(>0.09)@254 nm	0.20(>0.15)@410 nm
Rise Time(μs)	5.9	2
Operating Temperature(°C)	-10~+60	-10~+60
Storage Temperature(°C)	-20~+70	-20~+70
Shunt Resistor(MΩ)	10 (>5)	(>10)
Noise Equivalent Power NEP(W / √Hz)	4.5×10 <sup>-13</sup>	2.0×10 <sup>-13</sup>
Max.Operating Current(mA@0V Bias)	0.1	10.0
Junction Capacitance (pf@0V Bias)	4500	8800
Signal Output	current	current
Output Signal Polarity	P	P

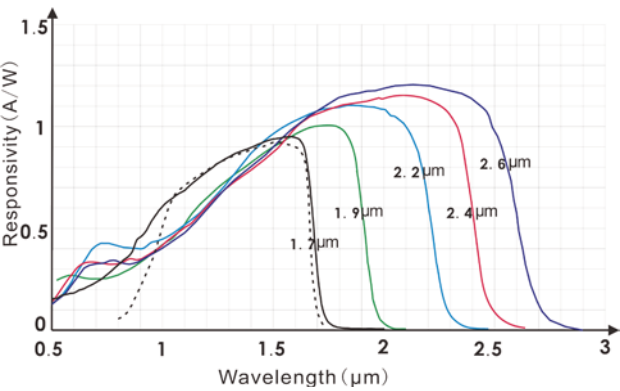


DInGaAs Detectors

DInGaAs Detectors



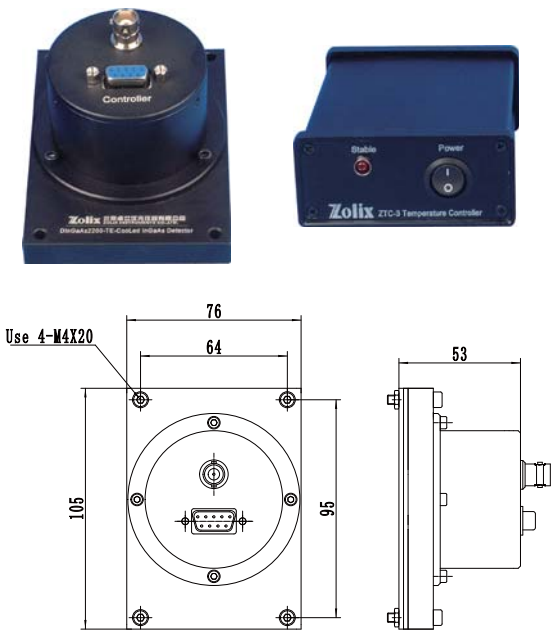
DInGaAs series Detectors are room temperature, high performance. InGaAs detectors operating over the NIR range from 0.8μm to 2.6μm. The two kinds of DInGaAs1700-R03M, DInGaAs2600-R03M detectors have the same construction design.



Specifications

	DInGaAs1700-R03M	DInGaAs2600-R03M
Effective Area Diameter(mm)	3	3
Spectral Range(nm)	800-1700	800-2600
Peak Responsivity (A/W, Min.)	0.9	1.1
Dark Current(nA, Max.)	100	1000
D* (typ.)	2.3×10 <sup>12</sup>	4.1×10 <sup>10</sup>
NEP (typ.)	1.2×10 <sup>-13</sup>	6.5×10 <sup>-12</sup>
Resistor(MΩ)	1.5	320Ω
Capacitance(pF)	800	9000
Rise Time(ns)	100	1μs
Signal Output	current	current
Output Signal Polarity	P	P

TE cooled DInGaAs Detectors

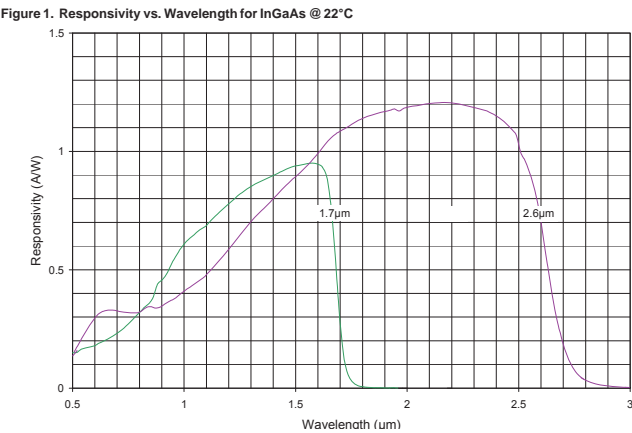


In the cooled mode, the detectors must be working with temperature controller (ZTC). Trans-impedance amplifier ZAMP is recommended

DInGaAs detectors application

- DInGaAs series and DInGaAs-TE series detectors are current output mode, before connecting to the signal processors such as oscilloscope or lock-in amplifier, the IV Trans-impedance Amplifier ZAMP is proposed to be connected as a pre-amp. and which can convert the current signal to voltage signal. If the signal processor indicates that it can be input current signal, you can connect the detectors to the signal processors directly. In order to improve the detection sensitivity, the IV Trans- impedance Amplifier is recommended.
- DInGaAs series and DInGaAs-TE series detectors used with the DCS103 data acquisition system, the IV Trans-impedance Amplifier is recommended in order to improve the detection sensitivity.
- DInGaAs series and DInGaAs-TE series detectors used with the DCS300PA data acquisition system, as signal amplifier has been integrated in the DCS300PA dual-channel; it does not need to match a pre-amplifier.
- In the TE cooled mode, DInGaAs-TE series detectors must work with Temperature controller (ZTC) for cooling control.

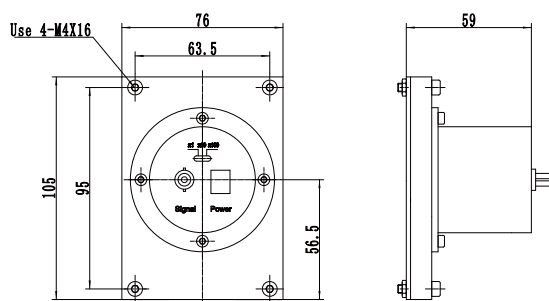
TE cooled InGaAs detectors, spectral range from 0.8μm to 2.6μm. DInGaAs(x)-TE detectors have the same construction. DInGaAs -1700-TE and DInGaAs-2600-TE both use two stage TE cooled InGaAs detectors. Spectral response curve see below.



Specifications

	DInGaAs1700-TE	DInGaAs2600-TE
Effective Area Diameter(mm)	3	3
Spectral Range ( nm )	800-1700	800-2600
Peak Responsivity ( A/W )	0.9	1.2
D*(typ.)	8.4×10 <sup>13</sup>	4.9×10 <sup>11</sup>
NEP(typ.)	3.2×10 <sup>-15</sup>	5.5×10 <sup>-13</sup>
Operating Temperature(°C)	-40	-40
Temperature Stability(°C)	±0.5	±0.5
Ambient Temperature(°C)	+10~+40	+10~+40
Signal Output	current	current
Output Signal Polarity	P	P
Temperature Controller	ZTC	ZTC

## PbS Detectors



Room temperature IR detectors, spectral range from 0.8 to 3.2 $\mu\text{m}$ .

DPbS2900 and DPbS3200 have the same construction (built-in pre-amplifier).

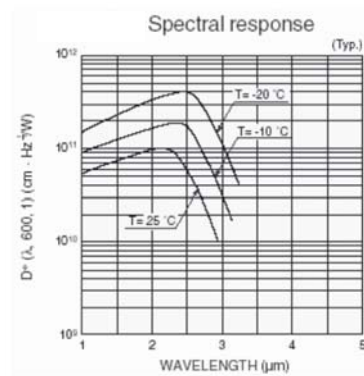


Fig1

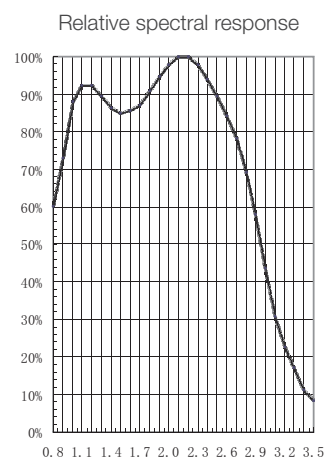


Fig2

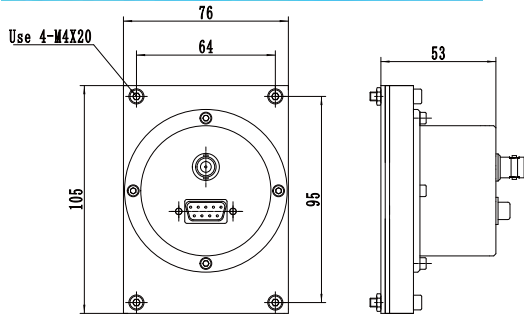
### PbS detectors application

- DPbS2900 and DPbS3200 are the photoconductive IR detectors, which must be used with lock-in amplifier.
- DPbS2900 and DPbS3200 detectors integrate the pre-amplifier, the detectors output signals are voltage signals. When working with DCS103 or DCS300PA, the detectors need choosing voltage signal as the sampling mode.

	DPbS2900	DPbS3200
Effective Area Diameter(mm <sup>2</sup> )	4x5	6x6
Spectral Range(μm)	0.8-2.9	0.8-3.2
Peak Wavelength(μm)	≥2.2	≥2.1
Su(V/W)	≥ 3×10 <sup>4</sup>	≥ 300
Rd (MΩ)	0.2-2	0.1-0.3
D* (cm(Hz) <sup>1/2</sup> /W)	≥5× 10 <sup>2</sup>	≥1×10 <sup>2</sup>
Time Constant	≤200	≤400
Magnification	×1 ,×10 ,×100	×1 , ×10 , ×100
Input Offset Voltage(μV)	<±1	<±1
Pre-amplifier Input Drift(μV)	±1	±1
Frequency Response Range(Hz)	100-1000 (400 Hz recommended)	
Signal Output	Voltage	Voltage
Output Signal Polarity	P	P

Note: Please refer to Fig1 for DPbS2900 and Fig2 for DPbS3200

InAs Detectors

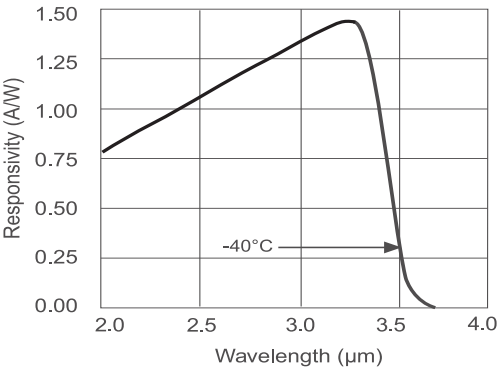


InAs Detectors Application:

- DInAs3800-TE detectors are current output mode, before connecting to the signal processors such as oscilloscope or lock-in amplifier, the IV Transimpedance Amplifier ZAMP is proposed to be connected as a pre-amp. and which can be input current signal, you can connect to detectors to the signal processors directly. In order to improve the detection sensitivity, the IV Transimpedance Amplifier is recommended.
- DInAs3800-TE detectors used with the DCS103 data acquisition system, the IV Trans-impedance Amplifier is recommended in order to improve the detection sensitivity
- DInAs3800-TE detectors used with the DCS300PA data acquisition system, as signal amplifier has been integrated in the DCS300PA dual-channel; it does not need to match a pre-amplifier
- In the TE cooled mode, DInAs3800-TE detectors must work with Temperature controller (ZTC) for cooling control

High performance InAs Series Detectors

NIR detectors, spectral range from 1 to 3.8 μm.  
DInAs3800-TE built-in TE cooling detectors



DInGaAs3800-TE	
Effective Area Diameter(mm)	2
Spectral Range(μm)	1-3.8
Peak Responsivity(A/W)	1.5
D* (@λpeak,1KHz)cm Hz 1/2W-1	9.1×10 <sup>12</sup>
NEP (@λpeak,1KHz)pW/Hz 1/2	4.4
Operating Temperature(°C)	-40
Temperature Stability(°C)	±0.5
Signal Output	current
Output Signal Polarity	P
Temperature Controller	ZTC

Pre-amplifier



Zolix offers a variety of low noise, high gain amplifier to working with the single channel detectors. The amplifier is mainly used to convert detector output signals, and amplify the signals. Then the signals are inputted to other measurement equipments, such as data acquisition system, oscilloscopes, DMM, to achieve weak signal measurement.

ZAMP-A is suitable for high impedance detectors.

Mode	ZAMP-A
Gain Range	10 <sup>3</sup> -10 <sup>10</sup> V / A
Noise Voltage	0.5mV
Input Impedance	0.001 Ohm
Output Impedance	<1 Ohm
Current Range	-5mA <I <sub>in</sub> <+5mA
Output Voltage Range	-5V<V <sub>out</sub> <+5V
Gain Accuracy	2% (10 <sup>3</sup> -10 <sup>8</sup> ) 5% (10 <sup>9</sup> -10 <sup>10</sup> )
Size	195*121*88 mm

## Data Acquisition Systems

Zolix offers a range of integrated optical wavelength solutions, spectroscopy instruments include Spectrographs, Monochromators and components including the light sources, detectors and data collection systems, such as A/D transformation data collector, lock-in amplifier, photon counter etc. Zolix can provide high performance of multichannel data acquisition unit, photon counter and other weak signal processor.

Lock-in Amplifier: DCS500PA high performance I/V amplifier

Data Acquisition Unit: DCS300PA dual channel pre-amplifier data acquisition units.

Photon Counting: DCS202PC/DCS210PC single photon counting



DCS500PA



DCS300PA



DCS202PC/DCS210PC



# Digital Lock-In Amplifier

## DCS500PA High Performance I/V Amplifier



### Specifications

#### Signal Channel

Voltage Input Mode	Single-ended or Differential
Full-scale Sensitivity	1nV to 1 V in a 1-2-5 sequence
Current Input	10 <sup>6</sup> or 10 <sup>8</sup> V/A
Impedance	
Voltage	10 MΩ // 25pF, AC or DC coupled
Current	1kΩ to virtual ground
C.M.R.R	>100 dB to 10 KHz, decreasing by 6 dB/ oct
Dynamic Reserve	>100 dB
Gain Accuracy	0.2% typ, 1% max
Noise	10nV/√Hz at 1 kHz
	0.13pA/√Hz at 1 kHz
	0.013pA/√Hz at 100 Hz
Line Filters	50/60 Hz and 100/120 Hz
Grounding	BNC shield can be grounded or floated via 1kΩ to ground

#### Reference Channel

Input	
Frequency Range	50 mHz to 120 kHz
Reference Input	TTL or sine
Input Impedance	1 MΩ/25 pF
Phase	
Resolution	0.01° increments
Absolute Phase Resolution	<1°
Relative Phase Resolution	<0.01°
Phase Noise	
Internal Ref.	Synthesized, <0.0001°rms at 1kHz
External Ref.	0.005°rms at 1 kHz (100 ms time constant, 12 dB/oct)
Drift	<0.1°/°C below 10 kHz
	<0.5°/°C above 10 kHz
Harmonic Detection	2F, 3F, ...nF to 120kHz(n<32,767)
Acquisition Time	
Internal Ref.	Instantaneous acquisition
External Ref.	(2 cycles+5 ms) or 40 ms, whichever is larger

### Features

- 50mHz to 120kHz frequency range
- Low-noise current and voltage inputs
- 1nV to 1V full-scale sensitivity
- Time constants extending from 10μs to 30s
- Up to 100dB dynamic reserve
- Up to 100dB CMMR

### Demodulator

Stability	
Digital outputs	no zero drift on all setting
Display	no zero drift on all setting
Analog outputs	<5 ppm/°C for all dynamic reserve settings
Harmonic rejection	-90dB
Time constants	10μs to 3ks (<200Hz)
	10μs to 30s (>200Hz)
	(6, 12, 18, 24 dB/oct rolloff)
Synchronous filters	Available below 20 Hz

### Internal Oscillator

Frequency	
Range	50 mHz to 120 kHz
Accuracy	25 ppm+30 μHz
Resolution	1 mHz
Distortion	-80 dBc (f<10 kHz), -70 dBc (f>10 kHz)
Amplitude	0.10Vrms to 1 Vrms
Accuracy	1%
Stability	50 ppm/°C
Outputs	Sine, 50 Ω output impedance

### Display

Screen	3.5 inch, 320×240 TFT
Display quantities	4 channels of data to display X,Y,R and θ
Display types	Large numeric readout

### Outputs

CH1 and CH2 Outputs	
Function	X, Y, R, θ
Amplitude	±5 V
Impedance	100 Ω

### Interfaces

RS232 and RS232 to USB interfaces. All instrument functions can be controlled and read through USB interfaces.
--

### General

Power requirements	Height
Voltage	220/240V AC
Frequency	50/60 Hz
Power	30 Ww
Dimensions	
Width	259 mm
Depth	320 mm

# Optical Chopper

## DCS540 Optical Chopper System



### Features

- 0.01Hz resolution
- 1Hz~5KHz chopping frequency
- Standard TTL/COMS level input & output
- 2.4inch LCD display
- Single Photoelectric encoder operating knob

### Specifications

Frequency stability	250ppm/°C (typ.)
Frequency drift	<1%
Frequency resolution	0.01Hz
Operating	Single Photoelectric encoder
Operating temperature	10~40°C

### Display

Display	2.4 inch, 320*240 LCD
Frequency display	6-digit

### Input & Output

Input&output	BNC
Input&output compatibility	standard TTL/COMS level
Input voltage	0 ~ 5 V
Input high level	> 3.6 V
Input low level	< 0.4 V
Min load resistance	500 Ω

### Interface

RS232 to USB interfaces. All instrument functions can be controlled and read through USB interfaces

### General

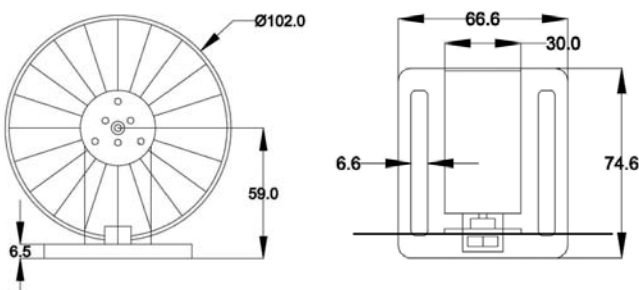
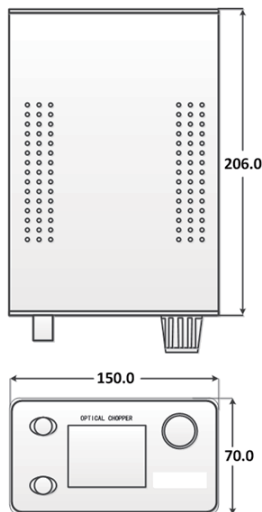
- Power requirements
 

Voltage	220 VAC ± 10%
Frequency	50 Hz ± 0.2 Hz
Power	< 30 W
- Dimensions
 

Width	206 mm
Depth	150 mm
Height	70 mm

### Chopper Blade & Frequency

DCS540-01 ( 2 Slot)	1~99 Hz
DCS540-02 ( 10 Slot)	20~1 KHz, standard
DCS540-03 ( 15 Slot)	30~1.5 KHz
DCS540-04 ( 30 Slot)	60~3 KHz
DCS540-05 ( 60 Slot)	120~5 KHz
DCS540-06 (In 5 Out 7 Slot)	In:10~500 Hz Out:14~700Hz



## Data Acquisition Systems

### DCS103 Data Acquisition System



#### Features:

- Wide measuring range can be changed to 256 times of gain.
- High measurement precision, high performance operational amplifier and  $\pm 15$  bits precision A/D converter).
- Has a dual input channel of the same performance, can be set respectively for the input DC voltage or DC current input.
- With dual 0 to 10V DC output D/A transformation of the channel.
- Single channel and rate measurement can be performed.
- The software system is easy to operate.

The DCS103 can be used as a normal DAQ system for low signals. It's also used with Zolix Omni- $\lambda$  monochromators, detectors and so on.

#### Specifications:

- Measurement Signal Range:
  - Current input:  $\pm 156\mu\text{m} \sim \pm 40\mu\text{A}$
  - Voltage input:  $\pm 15.6\text{mV} \sim \pm 4\text{V}$
- A/D Converter Accuracy: 15 Bits
- D/A Converter Accuracy: 12 Bits(output DC0-10V)
- Trigger input channel pulse width of input signal is not less than  $0.5\mu\text{s}$  TTL level, pulse frequency is not greater than 2 MHz.
- Triggering Signal output:
  - High level: Width= $25\mu\text{s}$ , Level=5V
  - Pulse: T= $0.1\text{ms} \sim 25\text{ms}$ , interval= $0.1\text{ms}$ , Level=5V Square signal, Frequency: 40Hz-10KHz
- Sampling storage make sampling speed can be increased to 17947 times per second ( only  $55.7184\mu\text{s}$  for each sampling)
- Communicating Interface: USB2.0, RS232
- Outline 260mmX260mmX120mm
- Weight 3.0kg

### DCS300PA Data Acquisition System



DCS300PA data acquisition unit is a dual channel pre-amplifier of weak signal acquisition unit, an upgrade version DCS103, covers DCS103 all data acquisition function, due to the increased the multi-position, high-gain pre-amplifier, thus is suitable for a weak signal data acquisition.

#### Specifications:

- Measurement Signal Range:
  - Current input  $\pm 1\text{mA} \sim \pm 10\text{mA}$
  - Voltage input  $\pm 1\text{mV} \sim \pm 10\text{V}$
- AUX Measurement Range: DC 0 ~ 10V
- Voltage Gain:  $10^0 - 10^4$
- Current Gain:  $10^3 - 10^7$
- Integration time:  $10\mu\text{s} - 10\text{s}$
- Data Points:  $\leq 2000$  ( Stored in RAM)
- Temperature Measurement Range  $-30 \sim 100\text{ }^\circ\text{C}$  (AD590)
- A/D Converter Accuracy: 16 Bits
- D/A Converter Accuracy: 12 Bits(output DC0-10V)
- Trigger output channel: can control shutter, solenoid
- Trigger input channel: TTL rising edge
- I/O 5 Input, 2 TTL Output
- CE
- Communicating Interface: USB2.0
- Power Supply: AC 100-240V ,50/60Hz(DC24V, 0.3A)
- Outline 260mmX260mmX120mm
- Weight 3.3kg

DCS Analog amplification data acquisition system				
		DCS103	DCS300PA	Remarks
		2 Channels	2 Channels	
Analog Input Channels	A/D Converter Accuracy	±15 bits	16 bits	DCS300PA Positive and negative input need to switch
	Current Input	Range:±156nA ~ ±40μA Gain:2 <sup>0</sup> ~ 2 <sup>8</sup>	Range:±1μm ~ ±10mA Gain:10 <sup>3</sup> ~ 10 <sup>7</sup>	
	Voltage Input	Range:±15.6mV ~ ±4V Gain:2 <sup>0</sup> ~ 2 <sup>8</sup>	Range:±1mV ~ ±10V Gain:10 <sup>0</sup> ~ 10 <sup>4</sup>	
DC Voltage Input Channels		No	AUX Channel	
	Input Range		DC 0V ~ 10V	
Temperature Measurement Channel		No	1 channel	
	Probe		AD590, Measurement Range:-30 ~ 100°C	
Analog Output Channel		2 Channels	2 Channels	DCS300PA: One channel is used for high Voltage Power control;One channel is used for Chopper Control
	D/A Converter Accuracy	12 bits	12 bits	
	Range	DC 0V ~ 10V	DC 0V ~ 10V	
Trigger Input Mode		software trigger	software trigger	
		External trigger	External trigger	
Trigger Output		Pulse Signal Output every data acquisition ends	No	

## Photon Counting Units

DCS200PC Photon Counting series			
	DCS202PC	DCS210PC	Description
Photon Counter Channel	One channel	One channel	Photon counter rate:100 Mcps
Analog Input Channels	No	Three channels	Signal input range: 0~10V voltage input; AD conversion accuracy: 16 bits;
Analog Output Channel	No	One channel	Voltage output range: 0 ~ 10 VDA conversion accuracy: 12 bits
Trigger Mode	software trigger	software trigger	receive instruction start count
	No	External trigger	External trigger input interface : TTL level compatible
Chopping Mode	No	Yes	Chopper control function, enhance the signal to noise ratio
Life Measurements Function	No	Yes	Life measurement range:10μS~10S
			Instrument Response Width: 1μS
Interface	Standard USB interface	Standard USB interface	
Instrument Size			240mm X 240mm X 120mm
Power Supply	AC110V/220V	AC110V/220V	

### DCS202PC series



DCS202PC Photon Counting, With the Company's production of high-performance Omni-λ spectrometers/monochromator, efficient and stable light source, high sensitivity detectors, water Raman signal to noise ratio up to more than 3000:1.

#### Specifications

■ Photon counter channel	Photon counter rate:100 Mcps
■ Interface	Standard USB interface
■ Instrument size	240mmX240mmX120mm
■ Certification	LVD, CE, RoSH
■ Power Supply	AC110V/220V
■ Weight	3.3kg

DCS210PC



DCS210PC single photon counter, in photon counting function it based on the realization chopper control function phosphorescence and fluorescence lifetime testing. The instrument is also equipped with 3DC voltage input analog signal acquisition channel (16Bits, 0~10V) and 1 analog signal output channels (12Bits, 0~10V), convenient combination system.

The instrument of the chopping mode can enhance the signal-to-noise ratio, With the Company's production of Omni-λ spectrometers/monochromator, efficient and stable light source, high sensitivity detectors, greatly enhance the sensitivity measurements, making the water Raman signal to noise ratio up to 4000:1.

DCS210PC photon counter lifetime measurement functions, with the Company's production of Omni-λ spectrometers/monochromators, pulsed light source module, SAC-FS fluorescence of the sample chamber, high sensitivity detector, can achieve>10uS long-life measurements, especially in strong light fluorescent powder and rare earth sample measurement. Instrument Response width:1uS. Achieve lifetime measuring range: 10uS~10S.

Specifications :

One Photon Counter Channel	Photon counter rate:100 Mcps
Three Analog Input Channels	Signal input range: 0~10V voltage input AD conversion accuracy: 16 bits
One Analog Output Channel	Voltage output range: 0~10 VDA conversion accuracy: 12 bits
Trigger Mode	External trigger input interface: TTL level compatible software trigger: receive instruction start count
Chopping Mode	Chopper control function, enhance the signal to noise ratio
Life Measurements Function	Life measurement range:10μS~10S Instrument Response Width:1μS
Interface	Standard USB interface
Instrument Size	240mmX240mmX120mm
Power Supply	AC110V/220V
Weight	3.4kg



# Software

Spectroscopy applications demand powerful software tools to provide everything from instrument control to acquisition of large data volumes. Zolix has pay more attention to software over years and offers a range of software solutions according to customers' requirement ;Focusing on our core markets of spectroscopy and related fields;

## ZolixScan Controlling Software

Detector control software

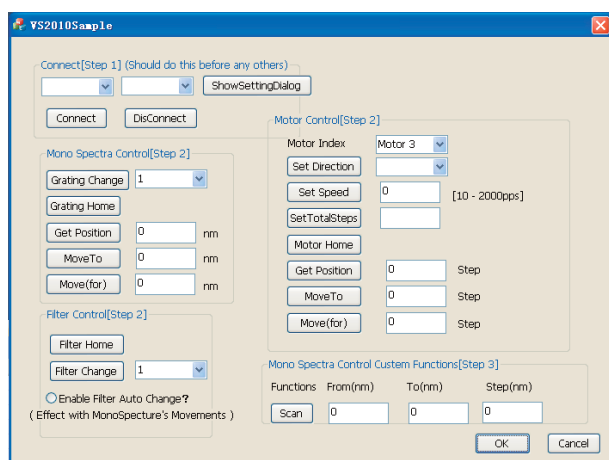
ZolixScan is Zolix's detector control software with versions specifically designed to run detectors; Spectroscopy and detectors as well as their associated accessories. All detectors parameters can be configured through the setup dialogues.

ZolixScan offers a dedicated platform for scanning monochromator applications. Monochromators, detectors, data acquisition unit, lock-in amplifier/chopper and motorized accessories can all be conveniently synchronized through a series of intuitive interfaces ;

Complex scanning sequences involving multiple gratings, filters and up to monochromators for fluorescence measurements—including a tunable light source setup—can be captured prior to acquisition start and executed without further intervention of the user. ZolixScan can also handle multiple detectors control and data display for Absorption-Transmission-Reflection spectroscopy etc.

## Features

- With detection capabilities ranging from UV to IR region through range of single point detectors—Silicon, PMTs, PbS, InGaAs etc. ZolixScan offers a dedicated platform for scanning applications
- Dedicated platform for scanning applications
- Step-by-step experiment building interface
- Complex scanning sequences involving multiple gratings
- Multiple detectors control and data display
- Post-acquisition mathematical data processing



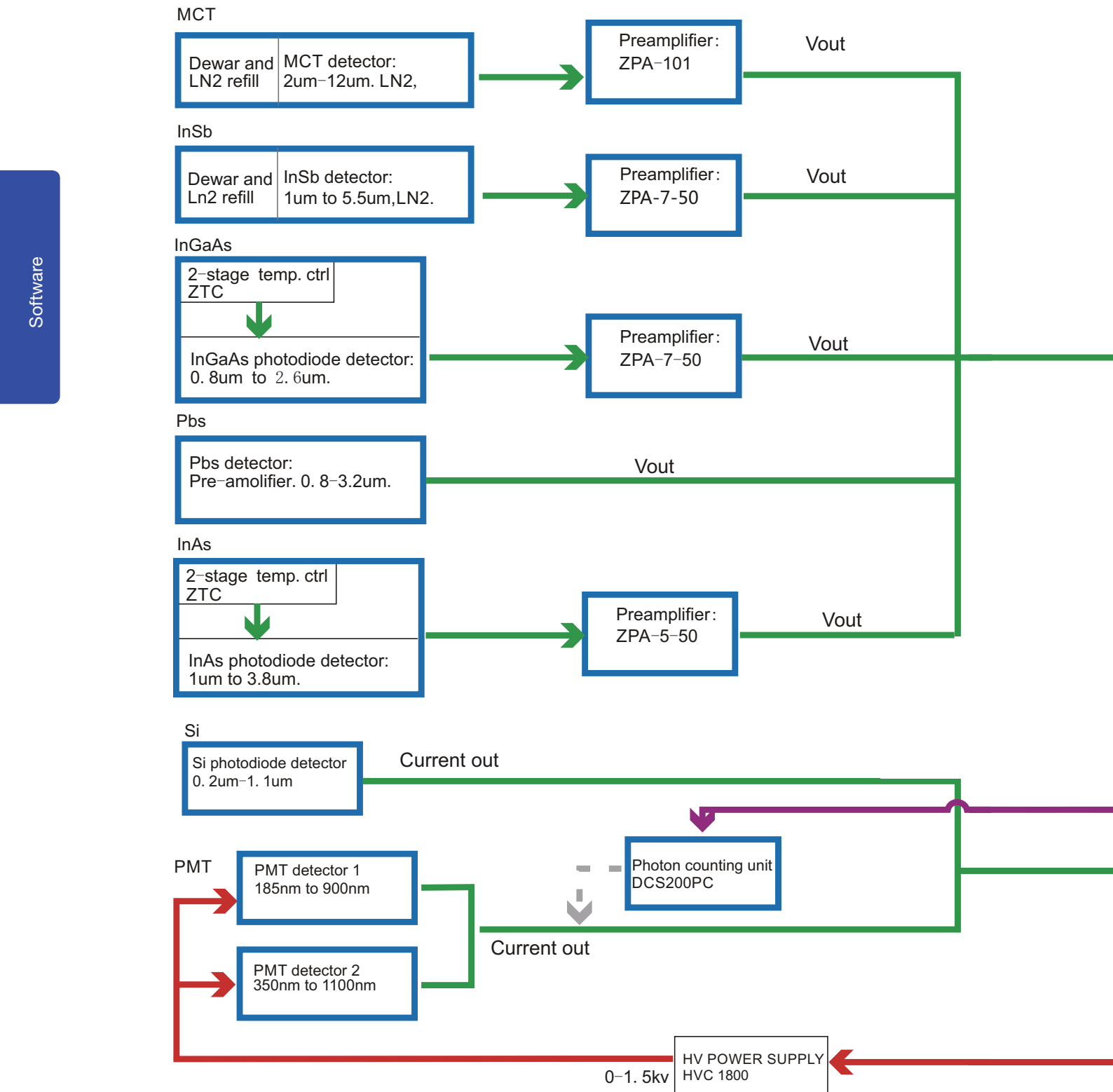
## SDK

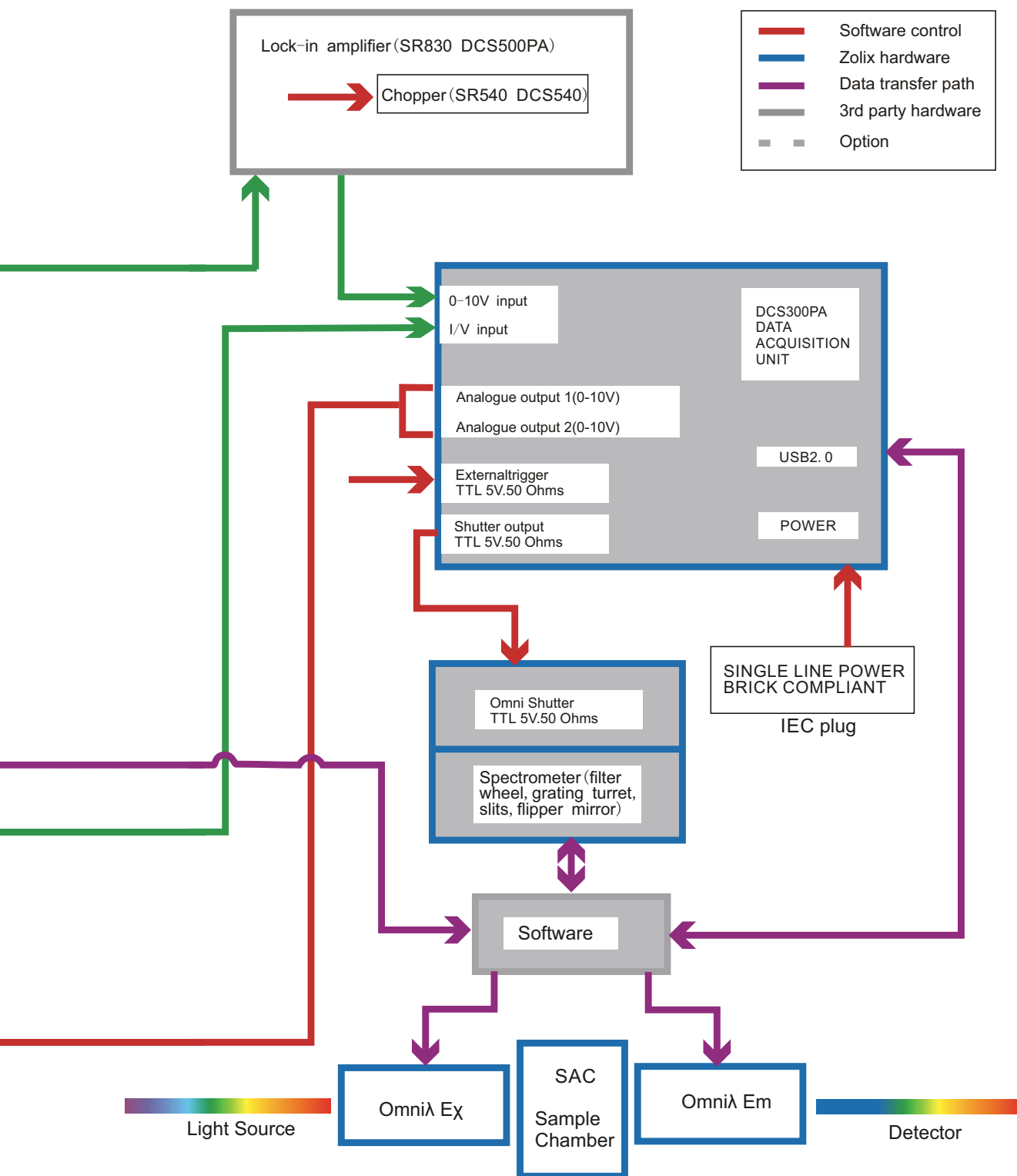
Software Development Kit

A software development kit that allows you to control range of detectors from your own application. Available as 32 and 64 bits libraries for windows( XP, Win 7/8/10). Compatible with C/C++, LabVIEW etc.

The SDK provides a suite of functions that allow you to configure the data acquisition process in a number of different ways. There are also functions to control the shutter operations etc. The SDK will automatically handle its own internal memory requirements .

## System Diagram





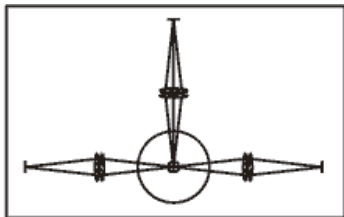
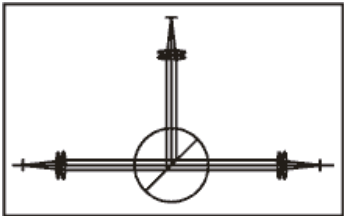
# Sample Chambers

Different samples need different sample chambers to help the users to get the best measurement result.

- SAC three-port sample chamber
- SAC-PL compact PL sample chamber
- SAC-Fluo fluorescence sample chamber
- SAC-RF total reflection sample chamber



## SAC three-port sample chamber



- SAC is a three-port sample chamber, which can be easily configured for transmittance, reflectance, absorbance, fluorescence or Raman measurements.
- The SAC is compatible with the range of Zolix monochromators and spectrographs.
- All quartz lenses for excellent transmission in the spectral range 200 nm to 2.5  $\mu\text{m}$ .
- Each quartz lens unit can be individually adjusted to provide either a collimated or focused beam depending upon the sample and application requirements. The collimated beam can be used for interference filter testing, transmittance, reflectance, absorbance of colored glass. The focused beam can be used for transmittance, reflectance, absorbance, density and concentration of gas/liquid.
- The sample holder comprises of an XY and rotation stage which allows critical alignment and rotation of the sample to be performed in order to optimise the recorded signal. XY translation of 10 mm in both axes and rotation of 360° is possible.
- Standard sample holder is SAC-SH01, which can hold sheet solid and liquid (need cuvette).

### Specifications :

SAC	
Wavelength Range	200-2500 nm
Amount of The Light Exit	3
Amount of Lens	3
Adjusting Range of the Height	213-243 mm
Weight	10 kg

### Order information:

Model	Description
SAC	Sample chamber with standard quartz lens(SAC-Lens01) and standard sample holder (SAC-SH01), 200-2500nm.
SAC-Lens02	CaF <sub>2</sub> IR lens with spectral range 0.2-8 $\mu\text{m}$ .
SAC-SH02	Solid powder sample holder
SAC-SH03	Cuvette holder, can support thickness $\leq$ 12.4mm, width 12.4mm
SAC-FM	Filter holder for $\Phi$ 25mm filter

## SAC-PL compact PL sample chamber



### Specifications

	SAC-PL
Wavelength Range	200-2500 nm
Amount Of The Light Exit	3
Amount Of Lens	3
Adjusting Range of the Height	213-243 mm
Weight	10kg

- SAC-PL01 Fluorescence spectrum with the spectral range from 200 nm to 2500 nm. Laser as the excitation light source, the fluorescence emission at 2 $\pi$ angle, the samples are in the face of the fluorescent light path collection, the fluorescence collecting efficiency greatly. Sample chamber also can realize the xenon lamp + monochromator output of monochromatic light, realize the excitation spectrum measurement. Diameter 25 mm laser cut-off filter can be fixed in the sample chamber, avoid excitation light into the spectrometer.
- SAC-PL02 Suitable for laser excitation, measure the photoluminescence spectrum. Spectral range for 200-2500 nm. Sample chamber can support ARS circulation liquid N2 refrigerator, minimum temperature 2 k, low temperature PL measurement.
- SAC-PL03 Fluorescence spectrum range 800-1400 nm. SAC-PL03 is reflection light path design for fluorescence collection, which eliminated the chromatism, so that the fluorescence signal from NIR to far IR spectral range can be a good coupling to the spectrometer. Sample chamber adopts gilded mirror reflectivity is as high as 98%, which improve the efficiency of fluorescence collection. Laser as the excitation light source, the fluorescence emission at 2 $\pi$ angle, the samples are in the face of the fluorescent light path collection, the fluorescence collecting efficiency greatly.

Sample chamber is equipped with a laser trap, if the sample is transparent, the laser trap can avoid a stray light of laser to be reflected.

- SAC-PL04 is UV-Visible-NIR reflection optical structure sample chamber, with Al coated reflector mirror, 200-2500nm, reflectivity $\geq$ 90%.

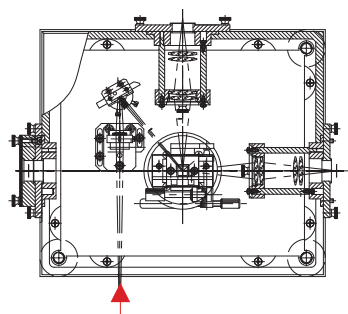


Fig. 1

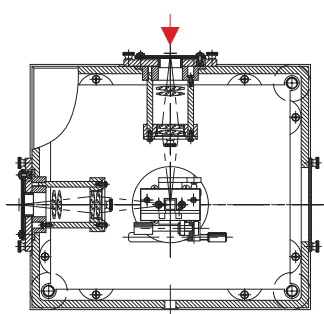


Fig. 2

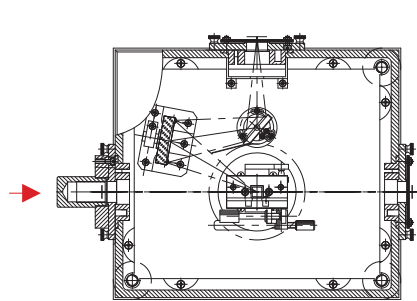


Fig. 3

### Order information:

Model	Description
SAC-PL01	Laser input optical Sample chamber, with standard quartz lens and standard sample holder, 200-2500nm.
SAC-SH02	Solid powder sample chamber
SAC-SH03	Cuvette holder, can support thickness $\leq$ 12.4mm, width 12.4mm
SAC-FM	Filter holder for $\Phi$ 25mm filter
SAC-FM	Filter holder for $\Phi$ 25mm filter

Model	Description
SAC-PL03	IR reflection optical structure sample chamber, with gold coated reflector mirror, reflectivity $\geq$ 98%.
SAC-SH02	Solid powder sample chamber

Model	Description
SAC-PL02	Cryocooler sample chamber, with standard quartz lens and standard sample holder, 200-2500nm.
SAC-SH02	Solid powder sample chamber
SAC-SH03	Cuvette holder, can support thickness $\leq$ 12.4mm, width 12.4mm
SAC-FM	Filter holder for $\Phi$ 25mm filter
SAC-FM	Filter holder for $\Phi$ 25mm filter

Model	Description
SAC-PL04	UV-Visible-NIR reflection optical structure sample chamber, with Al coated reflector mirror, 200-2500nm, reflectivity $\geq$ 90%.
SAC-SH02	Solid powder sample chamber

## SAC-Fluo fluorescence sample chamber



### Features:

- Big space design, easy to operate
- F/1 optical design, the best signal collection efficiency
- System automatically protect the detector when open sample compartment during testing
- Please order motorized filter wheel separately ( refer to Page34 SD25-R series.)
- Fluorescence quantum yield integrating sphere(SAC-IS option)
- Polarization accessory( option)

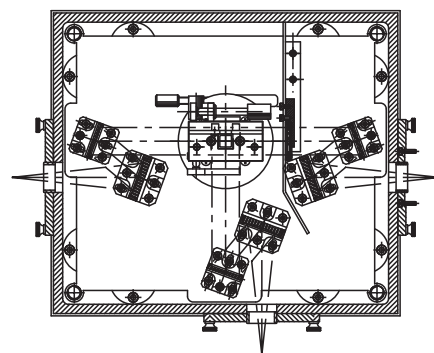
Please refer to Page 55 if you want to know more details for application ; Welcome to contact us and discuss your requirements !

## SAC-RF total reflection sample chamber



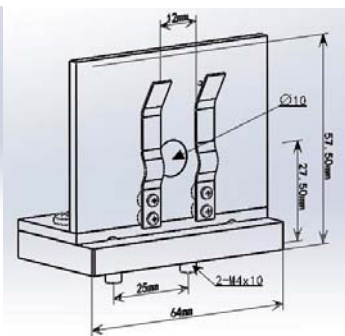
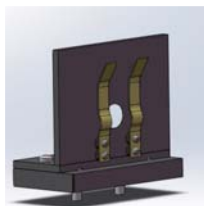
### Features:

- Design for transmittance, reflectance, absorbance measurement, using reflection optical structure, elimination of the influence of the chromatic aberration.
- For liquid and other transparent materials
- SAC-RF01 is UV-Visible-NIR reflection optical structure sample chamber, with Al coated reflector mirror.
- SAC-RF02 is IR reflection optical structure sample chamber, with gold coated reflector mirror.



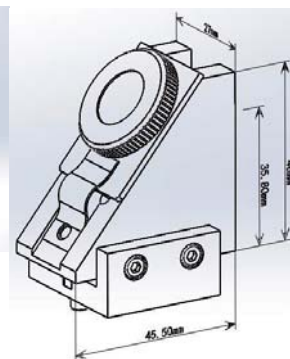


## Accessories for SAC series product



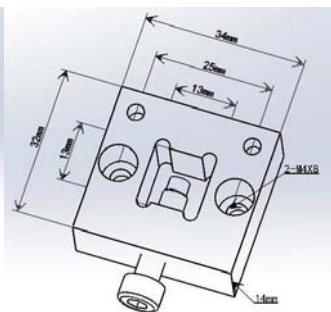
**SAC-SH01**

standard sample holder, which can hold sheet solid and liquid (need cuvette)



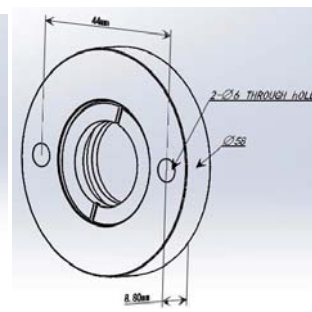
**SAC-SH02**

Solid powder sample holder



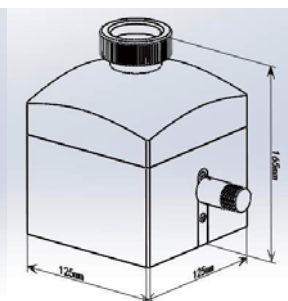
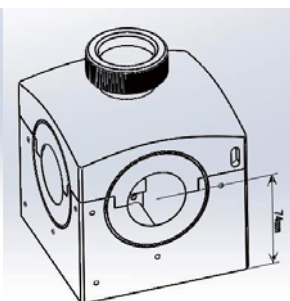
**SAC-SH03**

Cuvette holder, can support thickness  $\leq 12.4\text{mm}$ , width  $12.4\text{mm}$



**SAC-FM**

Filter holder for 25mm filter

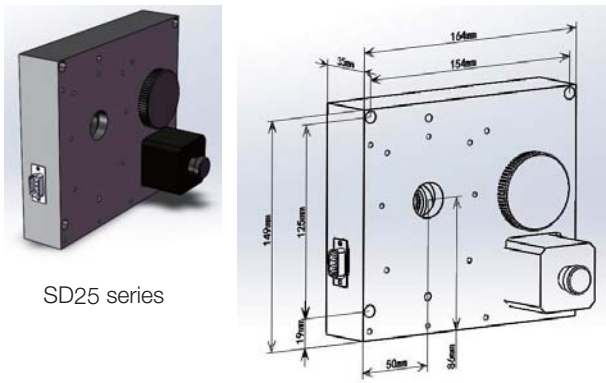


**SAC-IS**

Fluorescence quantum yield integrating sphere

# Motorized Filter Wheels

The SD25 six position filter wheel holds up to six 25mm diameter filters(aperture 22mm). For the automatic filter wheel, stepping motor drives the compact filter wheel via the monochromator/spectrograph controller. The SD25 filter wheel is fully compatible with the Omni-λ series monochromators/spectrographs.



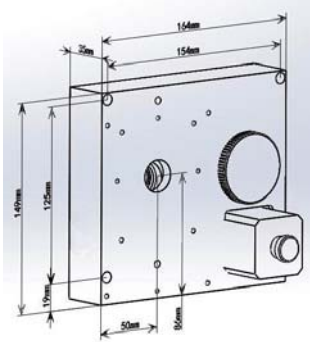
SD25 series

## Features

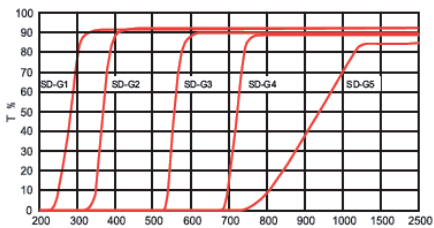
- Six Position Stepping Motor Controlled Filter Wheel
- Accommodates 25mm diameter filters (option)
- Integrates with Omni-λ Monochromator/Spectrograph and Software



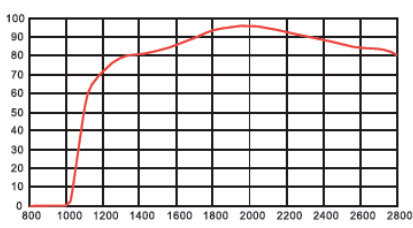
SD25-R series



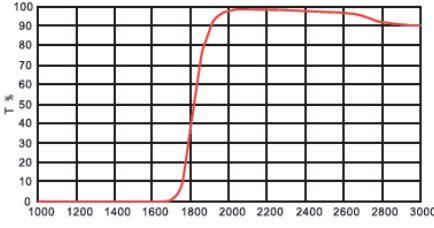
## Filter Spectral Transmittance Curves



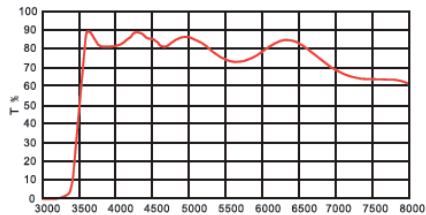
SD-G1(~5)-25



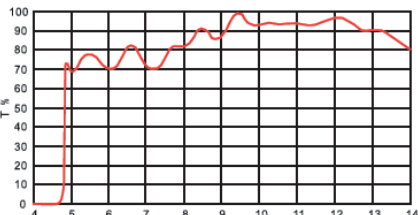
SD-G6-25



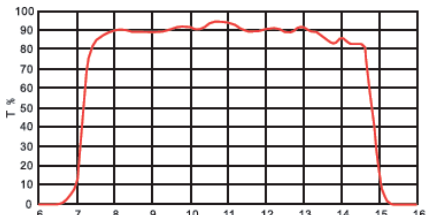
SD-G7-25



SD-G8-25



SD-G9-25



SD-G10-25

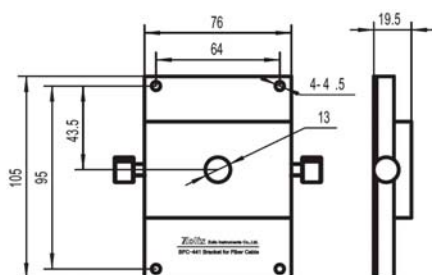
## Selections

Model	Model	Spectral Range			Filter#					
		(nm)	NO.1	NO.2	NO.3	NO.4	NO.5	NO.6		
SD25	SD25-R	It doesn't have filter; Please fix filters with 25mm diameter freely								
SD25-IR1	SD25-IR1-R	200-1500	none	SD-G1-25	SD-G2-25	SD-G3-25	SD-G4-25	SD-G5-25		
SD25-IR2	SD25-IR2-R	200-2000	none	SD-G1-25	SD-G2-25	SD-G3-25	SD-G4-25	SD-G6-25		
SD25-IR3	SD25-IR3-R	400-3000	none	SD-G2-25	SD-G3-25	SD-G4-25	SD-G6-25	SD-G7-25		
SD25-IR5	SD25-IR5-R	650-5000	none	SD-G3-25	SD-G4-25	SD-G6-25	SD-G7-25	SD-G8-25		
SD25-IR8	SD25-IR8-R	800-8000	none	SD-G4-25	SD-G6-25	SD-G7-25	SD-G8-25	SD-G9-25		
SD25-IR12	SD25-IR12-R	1300-12000	none	SD-G6-25	SD-G7-25	SD-G8-25	SD-G9-25	SD-G10-25		

SD25-R series is for Omni-λ200i and sample chamber SAC-FLUO only ;SD25 series is for Omni-λ300i/500i/750i

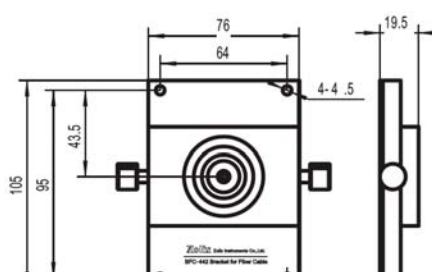
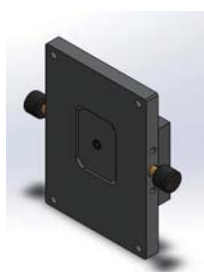
# Fiber Adapters

BFC series fiber adapter can be compatible with the range of Zolix monochromators and spectrographs or sample chamber.



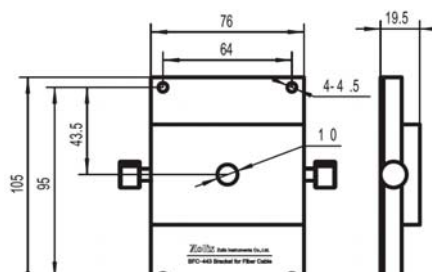
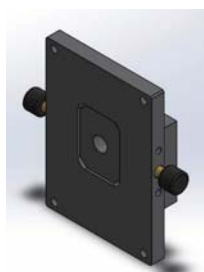
## BFC-441

Adjustable fiber adapter with horizontal translation capability for 13mm diameter fiber optic bundle for Zolix monochromators and spectrographs.



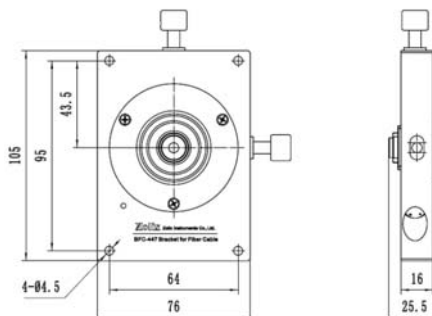
## BFC-442

Adjustable fiber adapter with horizontal translation capability for SMA905 Termination fiber for Zolix monochromators and spectrographs



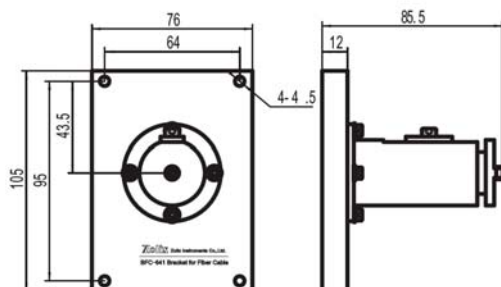
## BFC-443

Adjustable fiber adapter with horizontal translation capability for 10mm diameter fiber optic bundle for Zolix monochromators and spectrographs.



## BFC-447

Adjustable(XY) fiber adapter, for 10mm, 13mm diameter fiber optic bundle, SMA905 Termination fiber.



## BFC-641

SMA termination fiber to SAC Sample Chamber.

# Light Sources



## 37 Light Sources

## 38 Xenon Light Sources and Tungsten-halogen Light Sources

39 150W Xenon Light Source— GLORIA-X150A

41 500W Xenon Light Source— GLORIA-X500A

42 150W-250W Tungsten-halogen Light Source — GLORIA-T150A/T250A

## 43 Tunable Monochromatic Light Source

## 47 Light Source Accessories

44 Lens Sets

45 Others

## 50 Light Sources for Spectroscopy

50 LED light sources

# Light Sources

We offer wide range of light source from UV to IR including arc light source, halogen Light Source, tunable monochromatic light source and LED light source. And all the necessary components & accessories to make them work well.

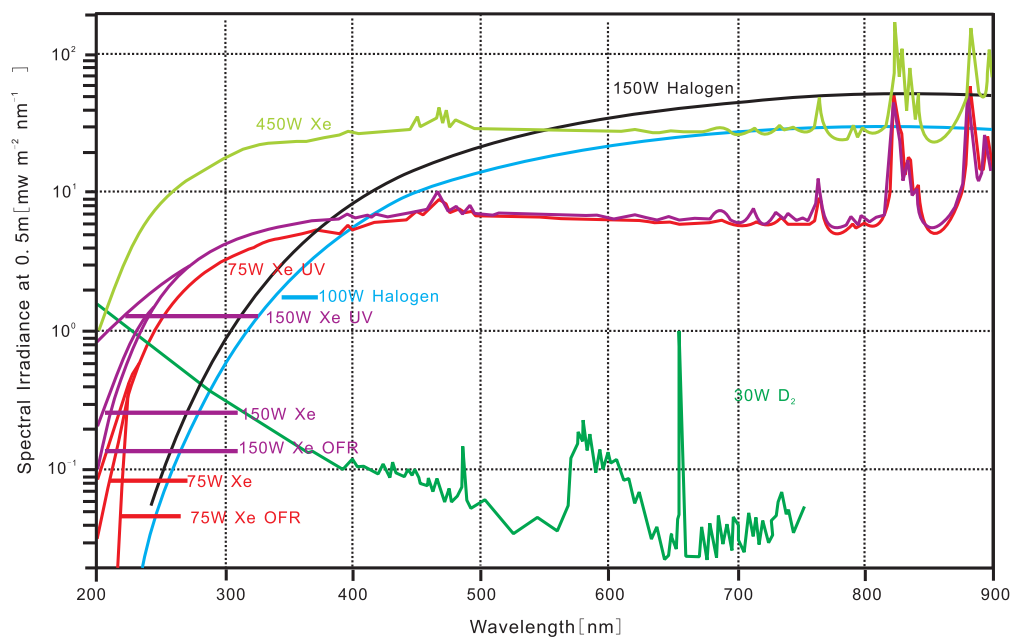
Whether you need single-wavelength or broadband radiation - Zolix has the right light source. We offer small, bright "LED sources" and continuous light source.

All light sources are designed for versatility, flexibility and efficiency, providing good solutions for individual applications.

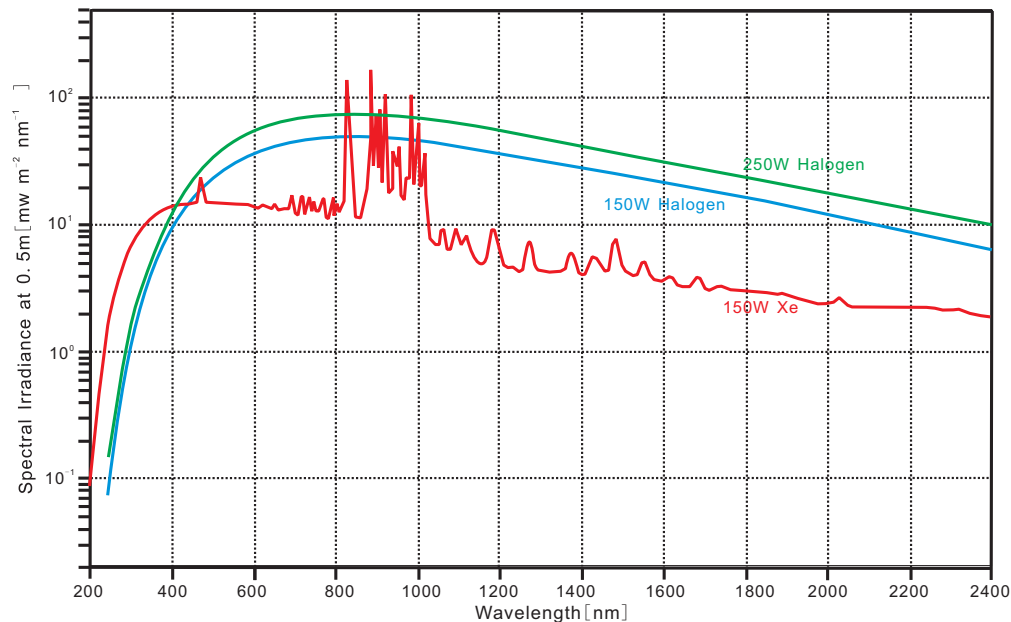
Welcome to contact us for discussing your application which light source and accessories are best suited!

## Spectral radiance curve

Spectral irradiance of 30W Deuterium Lamp, 75W/150W, 450W Xenon Lamp, 100W/150W Tungsten-Halogen Lamp



Spectral irradiance of 150W Xenon Lamp, 150W, 250W Tungsten-Halogen Lamp



# Xenon Light Soures And Tungsten-halogen Light Sources

## Model Selections

Model	GLORIA-X150A	GLORIA-X500A	GLORIA-T150A	GLORIA-T250A	
Light source housing					
	Spectral range	200-2500nm	250-2500nm	300-2500nm	
	Power	150W	500W	150W	250W
	Center Height	137-173mm	157-193mm	137-173mm	137-173mm
	Color Temperature	6000K	6000K	>3000K	>3000K
	Light Ripple	≤0.5%	≤1%	≤0.5%	≤0.5%
	Weight	4.5kg	5.8kg	4.5kg	4.5kg
Power Supply					
	Power	150W	500W	150W	360W
	Output Current	7-9A	0-30A	0-6.5A	0-10.8A
	Current Ripple	≤0.05%/h(@8.5A)	≤0.05%/h(@25A)	≤0.05%/h(@6.25A)	≤0.05%/h(@10.5A)
	Output Voltage	0-25V	0-30V	0-25V	0-25V
	Input Voltage	AC110/220V±10%	AC110/AC220V±10%	AC110/220V±10%	AC110/220V±10%
	Weight	4kg	4kg	4kg	4kg

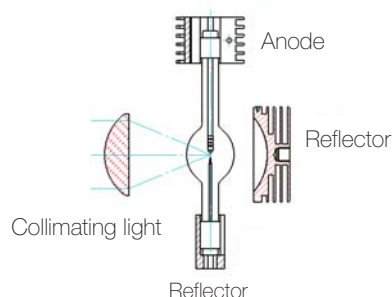
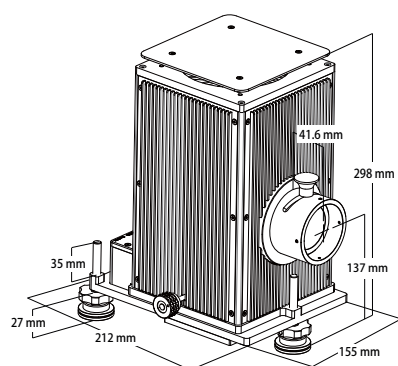
## Lamp Sheet

	Power (W)	Model	Type	Voltage (V)	Current (A)	Lifetime (h)	Approx. flux (lm)	Intensity (cd)	Approx.Luminance (cd/mm²)	Luminous Area(mm)
Xe	150	LSB-X150AOFr	Ozone-free	17.5	8.5	3000	2900	290	200	0.5×1.6
Xe	150	LSB-X150AUV	UV Enhanced	20	7.5	3000	3000	300	150	0.5×1.7
Xe	150	LSB-X150	Economical	18	8.5	1000	3200	320	—	0.8×2.0
Xe	500	LSB-GX500AOFr	Ozone-free	17	28	2000	14500	1450	400	0.9×2.5
Xe	500	LSB-GX500	Economical	20	25	1000	14200	1420	—	1×2.7
Hg(Xe)	500	LSB-GMX500	Economical	25	20	—	—	—	—	3
Halogen	150	LSB-T150	Economical	24	6.25	2000	3200	—	—	8×4
Halogen	250	LSB-T250	Economical	24	10.5	300	9000	—	—	8×4





## 150W Xenon Light Source — GLORIA-X150A



Output beam



Xe arc lamp light sources are the preferred artificial sources to simulate sunlight. The high color temperature (6000K) of the Xenon lamps is a close match to the solar temperature. This results in very similar solar spectra in the UV and VIS although the source has some Xe emissions lines in the near IR.

Application for fluorescence, luminescence and phosphorescence, absorbance and reflectance, photochemistry, photolithography, solar simulation and so on.

- Spectral range from UV to VIS(200-2500nm)
- Optical axis height is 157-193mm
- Output beam diameter is 46mm
- Supports wide range of accessories
- Fan cooled housing

### More light

A spherical reflector collects the output from the rear of the lamp and focuses it on or near the arc, for collection by the condenser. The output is increased by as much as 60%.

### Lamp adjustment

The housing has precise external lamp adjusters.

They let you place the arc where you want it. This is important for simplifying fiber and slit illumination. In many applications, this eliminates the need for readjusting any optics located beam path outside the housing.

### Arc Lamp Power Supply

#### Current and light ripple

Direct current generated by rectification always has a current ripple (superimposed on the direct current). Current ripple is the main factor of cathode fissuring and therefore greatly influences lamp luminous flux or radiant power and lamp life.

But for the most (scientific) applications the light ripple is most important. This not only depends on the current ripple, but on the operation conditions typical light ripple of our arc light sources is 0.5%.

#### Igniters

To ignite an arc lamp it is necessary to ionize the insulation gas between the electrodes. This is done by a high voltage discharge or flash. To get the flash into a stable stationary arc discharge, certain conditions must be met:

A sufficient high ignition voltage from the ignitor and a sufficient high electrical energy in the ignition spark.

A sufficient quick start of current flow and adequate open circuit voltage.

The two last conditions must be achieved by the power supply. Some arc lamps require constant current, others constant power for optimal operation. The power supplies must be designed meet the operation conditions.



Current or power adjust

During operation the tungsten from the electrodes evaporates slowly and deposits on the inside of the lamp envelope. This reduces the radiated output by up to 30% during lamp life. If application requires constant light output, the lamp current must be adjustable within a certain range

Specification of power supply

Voltage	110/220V AC ±10%
Power consumption	<250W
Power	150W
Adjustable current	7-9A
Current ripple	≤0.05%(@8.5A)
Line voltage	>20KV
Light output ripple	0.05%(8.50A )

Constant light output

The output intensity of a new lamp decreases continously during lamp life. To irradiate your targets with constant intensity (during lamp life) you must start a new lamp with 80% of lamp current or power value and then gradually apply higher current. When the rated current value is reached the lamp is statistically used up.

Ordering Information

To build a complete light source you will need: Lamp housing, condensing optics, lamp with appropriate adapter, electrical interface, cable and power supply. As an option we suggest the rear reflector for more output.

Model	Description	Detail
GLORIA-X150A	150W Xenon Light Source	150W Xenon Light Source(GLORIA-X150A)includes housing, power supply and lamp(LSB-X150)

Lamp Sheet

Model	Power(W)	Voltage(V)	Current(A)	Lifetime (h)	Approx. flux (lm)	Intensity (cd)	Approx.Luminance (cd/mm²)	Luminous Area(mm)	Lamp size (L*D)mm
LSB-X150AOFR	150	17.5	8.5	3000	2900	290	200	0.5×1.6	127*20
LSB-X150AUV	150	20	7.5	3000	3000	300	150	0.5×1.7	127*20
LSB-X150	150	18	8.5	1000	3200	320	—	0.8×2.0	127*20

Note: LSB-X150AUV is UV enhanced with spectral range 200-2500 nm, please vent the ozone to the outside.

## 500W Xenon Light Source — GLORIA-X500A



500W Arc light housing expand to operates 350 W Xe and 500 W Hg(Xe)arc lamps under optimal and for these lamps necessary conditions. Switching between the lamps only requires changing the lamp adapter to position the lamp in the center of the housing.

- Spectral range from UV to VIS(200-2500nm)
- Optical axis height is 157-193mm
- A spherical reflector collects the output from the rear of the lamp and focuses it on or near the arc, for collection by the condenser.
- The output is increased by as much as 60 %
- Output beam diameter is 46mm
- Typical light ripple of our arc light sources is less than 1%.
- Supports wide range of accessories
- Fan cooled housing

Xe arc lamp light sources are the preferred artificial sources to simulate sunlight. The high color temperature (6000K) of the Xenon lamps is a close match to the solar temperature. This results in very similar solar spectra in the UV and VIS although the source has some Xe emissions lines in the near IR.

Application for fluorescence, Luminescence and Phosphorescence, Absorbance and Reflectance, Photochemistry, Photolithography, Solar simulation

### Cooling

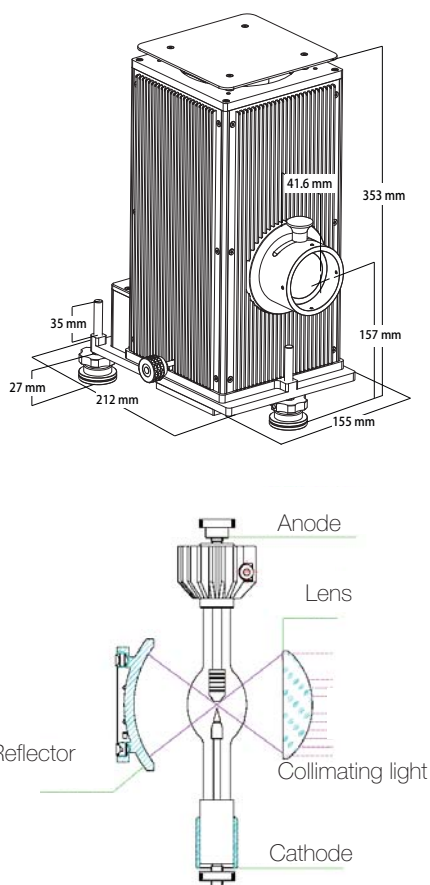
Proper cooling is essential for correct lamp operation. The bulb temperature of arc lamps should not exceed 600-900°C, Because at higher temperatures the bulb is not able to withstand the high gas pressure due to a temperature-related change of the quartz structure (recrystallization). Because of potential current conductor oxidation, the socket temperature must not exceed 230°C.

### Safety

Our lamp housings include safety features to prevent lamp damage and accidental exposure. The door inter-lock prohibits the operation of the lamp while the door is open. Overheating of the lamp caused by a defect is avoided by a thermal interlock which shuts down the power supply.

### Ordering Information

To build a complete light source you will need: Lamp housing, condensing optics, lamp with appropriate adapter, electrical interface, cable and power supply. As an option we suggest the rear reflector for more output.



Output beam

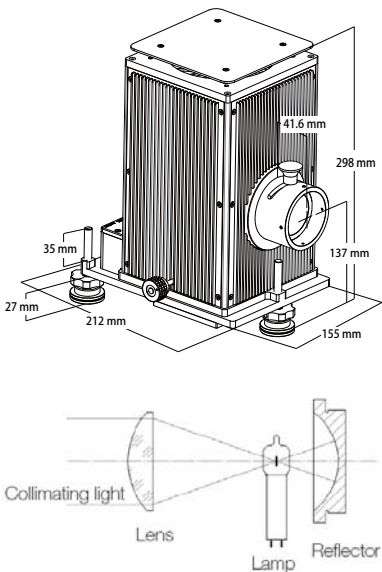
Model	Description	Detail
GLORIA-X500A	500W Xenon Light Source	500W Xenon Light Source(GLORIA-X500A) includes housing, power supply and lamp(LSB-X500)

### Lamp Sheet

Model	Power(W)	Voltage(V)	Current(A)	Lifetime (h)	Approx. flux (lm)	Intensity (cd)	Approx.Luminance (cd/mm <sup>2</sup> )	Luminous Area(mm)	Lamp size (L*D)mm
LSB-GX500AOFR	500	17	28	2000	14500	1450	400	0.9×2.5	175*30
LSB-GX500	500	20	25	1000	14200	1420	—	1×2.7	190*35

Tips: Xe and Hg (Xe) lamps are strong UV sources and emit dangerous levels of ultraviolet radiation. Exposure to UV, even for short periods, can cause severe skin and eye burns. Always wear protective eyewear and gloves or clothing, when working near these sources.

150W-250W Tungsten-halogen Light Source — GLORIA-T150A/T250A



- Stable VIS-NIR sources
- Precision external lamp adjustments
- Choice of different UV-NIR condensing optics for collimated beam
- Supports wide range of accessories

The collimated beam diameter is 46mm and optical axis height is from 157 to 193mm.

Cooling

Tungsten halogen lamps become up to 900°C hot (surface temperature) during operation. They require a safe, temperature-controlled environment. Below 200°C the halogen cycle does not work. There is also a maximum permitted pinch temperature which must not in any case be exceeded during operation.

The housing has a cooling fan built in that provides the proper air flow.

Lamp adjustment

The housing has precise external lamp adjusters. They let you place the filament where it is needed. This is important for simplifying fiber and slit illumination. In many applications this eliminates the need for readjusting any optics located in the beam path outside the housing.

Reflector

A spherical reflector collects the output from the rear of the lamp and focuses it on or near the arc, for collection by the condenser. The output is increased by as much as 60%.

Power Supply

	LSP-T150A	LSP-T250A
Power(W)	150	300
Current(A)	0-6.5	0~10.8
Voltage(V)	0-25	0~25
Current ripple	0.05%	0.05%
Input voltage(V)	110/220V AC±10%	110/220V AC±10%

Lamps

Model	Power(W)	Current(A)	Voltage(V)	Approx. fix (lm)	Color temperature(K)	Average life (h)
LSB-T150	150	6.25	24	3200	3200	2000
LSB-T250	250	10.5	24	9000	-	300

Ordering Information

To build a complete halogen source you will need: Lamp housing, condensing optic, lamp and adapter, power supply and interface. As an option you might choose the rear reflector for more output.

Model	Name	Details
GLORIA-T150A	150w Tungsten-halogen Light Source	150W Tungsten-halogen Light Source(GLORIA-T150A) housing(LSH-T150A), power supply(LSP-T150A), lamp(LSB-T150).
GLORIA-T250A	150w Tungsten-halogen Light Source	250W Tungsten-halogen Light Source(GLORIA-T250A) housing(LSH-T250A), power supply(LSP-T250A), lamp(LSB-T250).

Safety Tips

- Although compared to arc and deuterium lamps it is only a little, tungsten halogen still produce UV radiation. Especially in the high wattages the ultraviolet radiation is hazardous. Always wear protective eyewear. When imaging the filament to small probes you will even need welding goggles during adjustments because of glare.
- Tungsten halogen lamps reach surface temperatures up to 900° C during operation. So the cooling period can last up to 15 minutes! Only then is it safe to touch the lamp.

## Tunable Monochromatic Light Source



The Tunable Light Source (TLS) are pre-aligned, pre-assembled illumination systems capable of outputting monochromatic light from 200nm. This is a complete plug and play system and includes TLS-C1 software.

TLS is composed of Zolix light source and spectrometer. It is very convenient for the users who want the flexibility of a modular design and the simplicity of an integrated system.

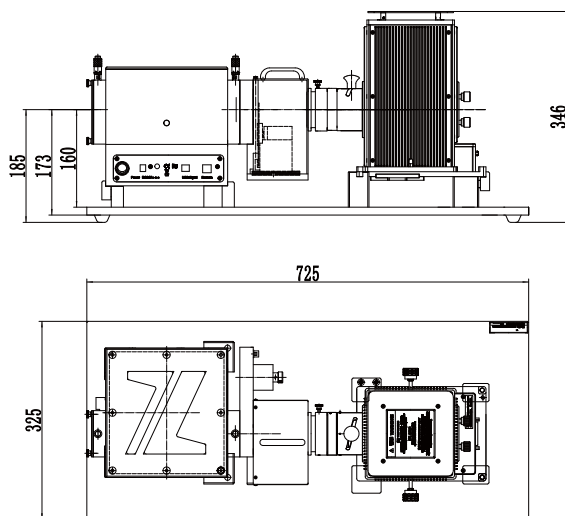


### TLS Selections

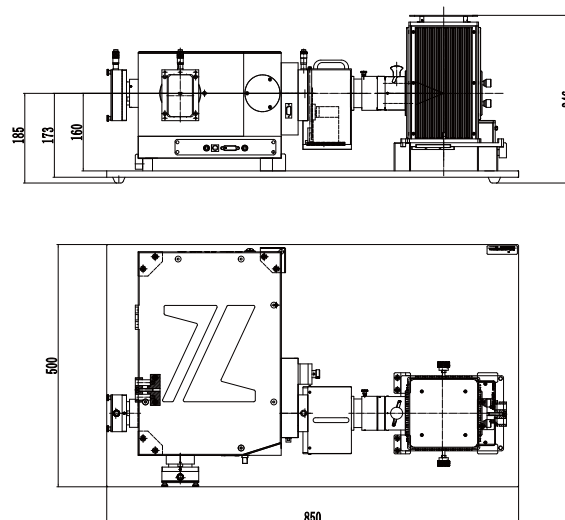
Model	Lamp type	Light ripple	Spectral range	Resolution	Bandwidth	Wavelength Accuracy	Wavelength Repeat-ability	Weight
TLS15-X150A	150W Xenon	< 0.5%	250-2200 nm	0.4nm@250-600nm 0.8nm@600-2200nm	0.4-16nm@250-600nm 0.8-32nm@600-2200nm	±0.25nm	±0.1nm	26kg
TLS15-T150	150W Tungsten-Halogen	< 0.5%	350-2200 nm	0.4nm@250-600nm 0.8nm@600-2200nm	0.4-16nm@250-600nm 0.8-32nm@600-2200nm	±0.25nm	±0.1nm	26kg
TLS3-X150A	150W Xenon	< 0.5%	250-2200 nm	0.08nm@250-1100nm 0.2nm@1100-2200nm	0.08-7nm@250-1100nm 0.2-14nm@1100-2200nm	±0.2nm	±0.1nm	45kg
TLS3-X300P	300W Xenon	< 1%	300-2200 nm	0.08nm@250-1100nm 0.2nm@1100-2200nm	0.08-7nm@250-1100nm 0.2-14nm@1100-2200nm	±0.2nm	±0.1nm	45kg
TLS3-X300PU	300W UV Xenon	< 1%	200-2200 nm	0.08nm@250-1100nm 0.2nm@1100-2200nm	0.08-7nm@250-1100nm 0.2-14nm@1100-2200nm	±0.2nm	±0.1nm	45kg
TLS3-X500A	500W Xenon	< 1%	250-2200 nm	0.08nm@250-1100nm 0.2nm@1100-2200nm	0.08-7nm@250-1100nm 0.2-14nm@1100-2200nm	±0.2nm	±0.1nm	48kg
TLS3-T150A	150W Tungsten-Halogen	< 0.5%	350-2200 nm	0.08nm@250-1100nm 0.2nm@1100-2200nm	0.08-7nm@250-1100nm 0.2-14nm@1100-2200nm	±0.2nm	±0.1nm	45kg
TLS3-T250A	250W Tungsten-Halogen	< 0.5%	350-2200 nm	0.08nm@250-1100nm 0.2nm@1100-2200nm	0.08-7nm@250-1100nm 0.2-14nm@1100-2200nm	±0.2nm	±0.1nm	45kg

## Drawings(mm)

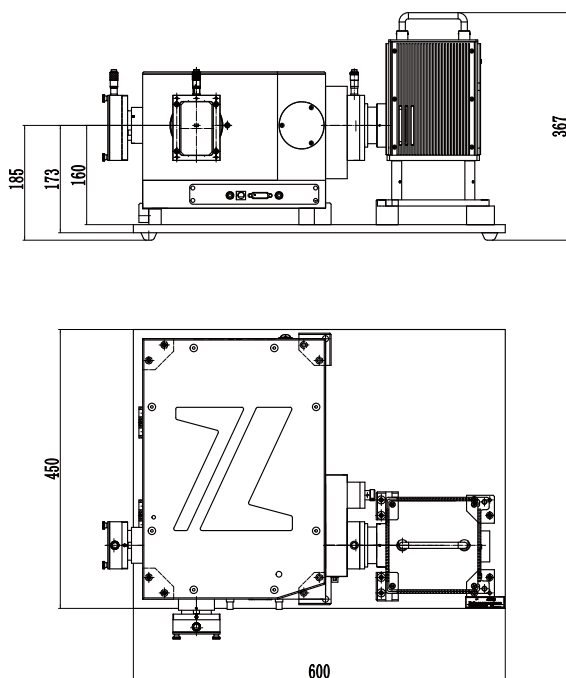
TLS15-X150A/TLS15-T150A



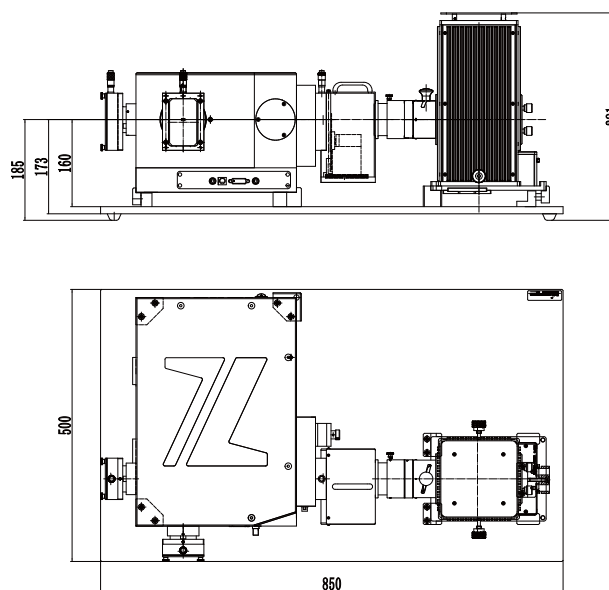
TLS3-X150A/TLS3-T150A/TLS3-T250A



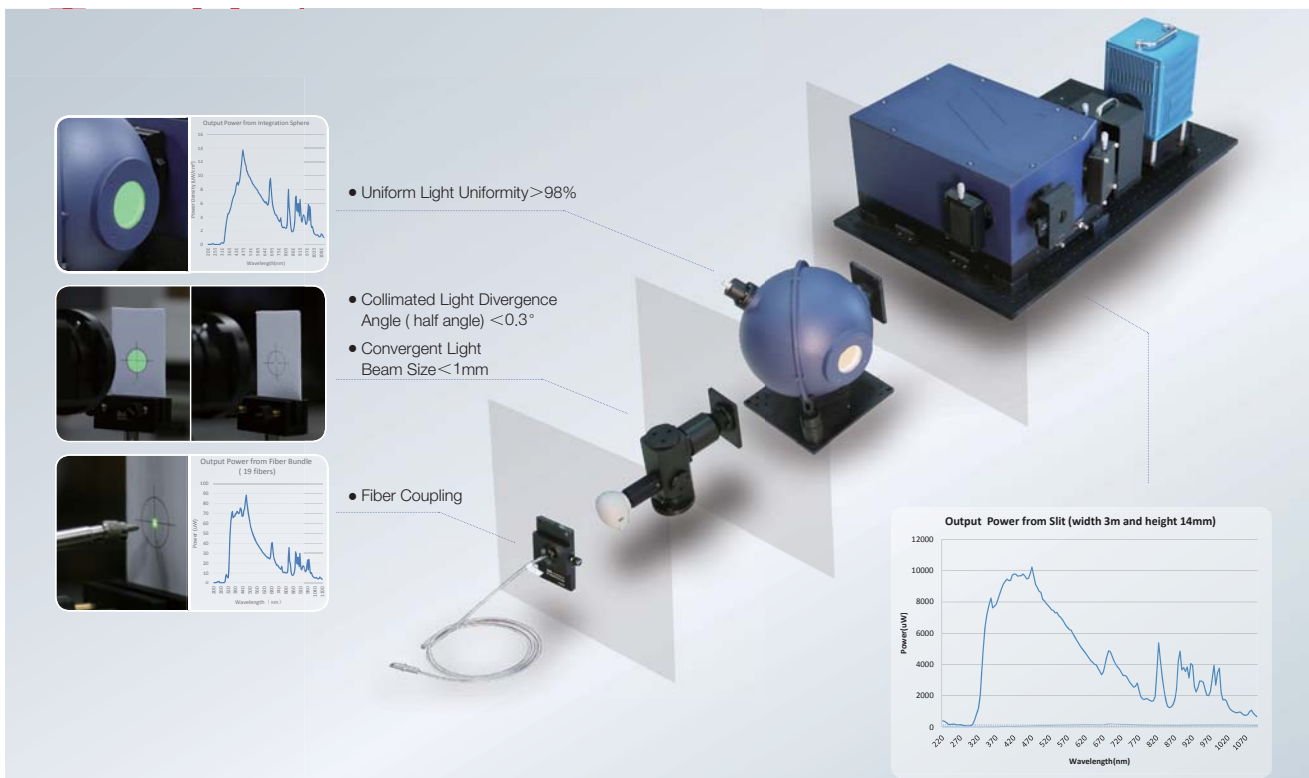
TLS3-X300P/TLS3-X300PU



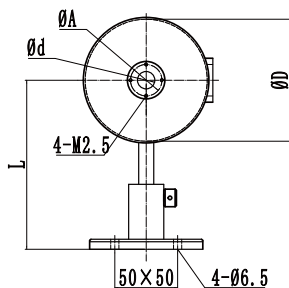
TLS3-X500A



## Accessories

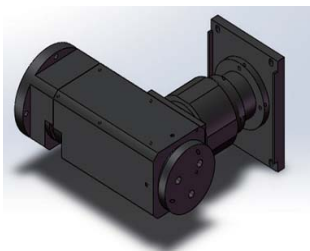


## Integration Sphere Uniform Light



Model	Diameter (mm)	Optical axis height(mm)	uniformity
IS-050-14	50	130-165	>98%
IS-100-25	100	145-165	>98%
IS-150-38	150	155-165	>98%
IS-200-50	200	160-165	>98%

## Collimated light adapter



Model	Mirror Coating	Spectral range	Divergence half-angle	Optical Beam size	
TLS-A5	Al	Full wave band	<0.3°	3-25mm	No mount for filter wheel
TLS-A6	Au	IR	<0.3°	3-25mm	
TLS-A7	Al	Full wave band	<0.3°	3-25mm	Must be used with filter wheel together
TLS-A8	Au	IR	<0.3°	3-25mm	

## Applications

- PEC Photochemistry Measurement System
- Transmission/Absorption /Reflection Measurement System
- Solar Cell Quantum Efficiency Measurement System
- The fluorescence Spectrum Measurement (as excitation light)
- Surface Photovoltage Test
- Detector Spectral Responsivity Measurement System
- Optical Lens Spectral Transmittance Measurement System
- Eye Protection Products Measurement System



## Adaptor for EQ Light Source(Model: TLS-Q1)

Zolix monochromator not only support Xenon/Tungsten-halogen Light Source, but also connect with Energetiq broadband light source ; This adaptor can upgrade to tunable light source if you have EQ light source directly ;

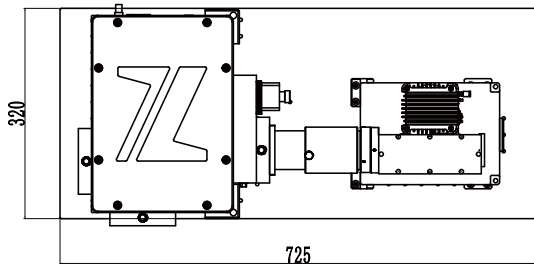
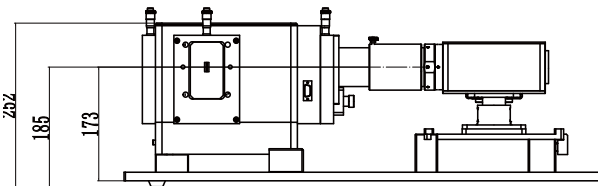
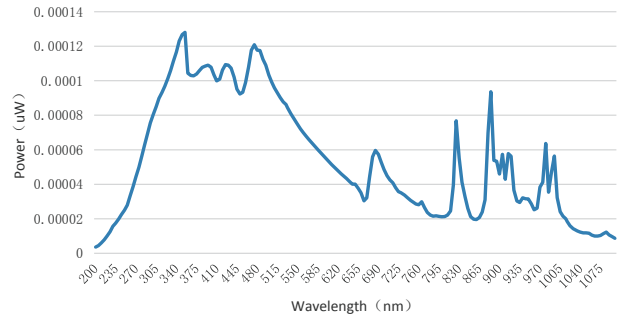
### Test condition

1200g/mm, blaze wavelength: 300nm

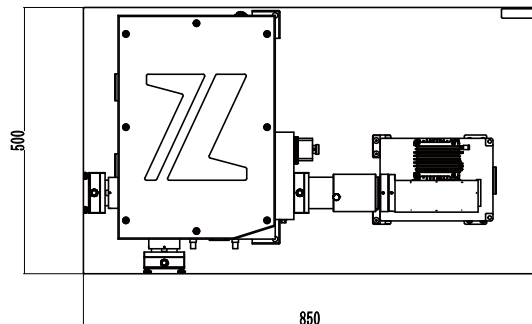
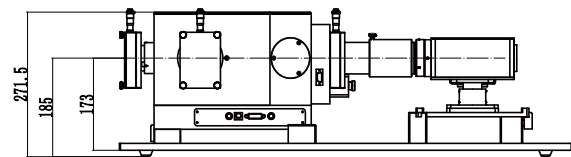
Spectral range: 200nm to 1200nm

Scan step: 5nm

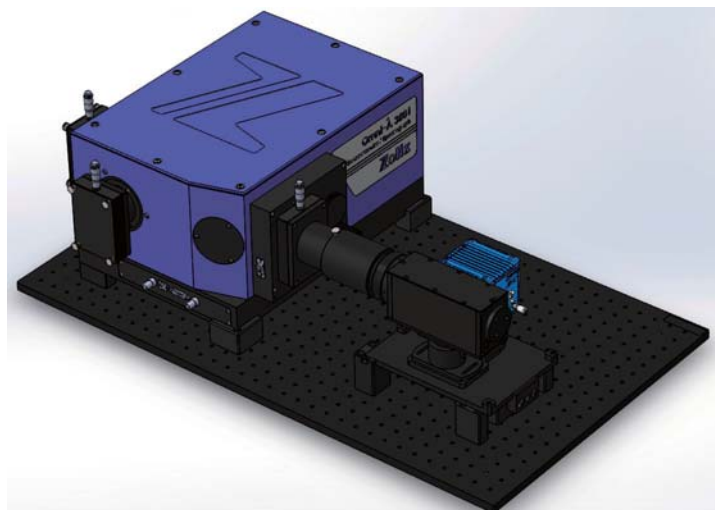
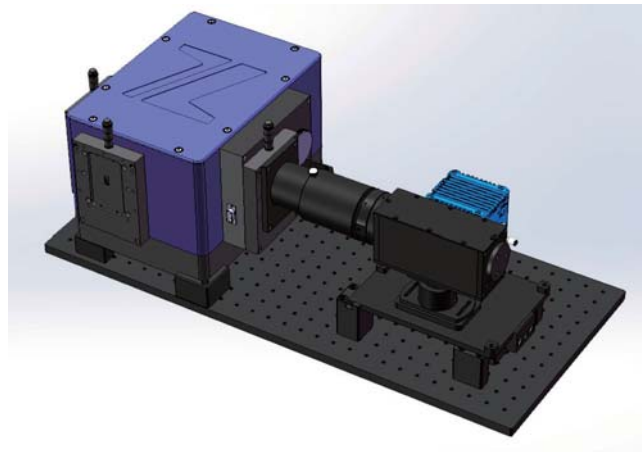
EQ99+300i TLS output power



Zolix 200mm monochromator with EQ-99X drawings



Zolix 320mm monochromator with EQ-99X drawings





## Light Source Accessories

You probably have to image the arc and filter, attenuate or split the beam, change the beam form or direction, place a shutter in the beam, control the light intensity or carry the light to a sample via a single filter or a filter bundle. We offer some useful and necessary accessories to customize your light source; these couple directly to the output of the lamp housing condenser.

Note: the condenser size of GLORIA series is 59mm.

### Light Source Accessories

Lens Holder



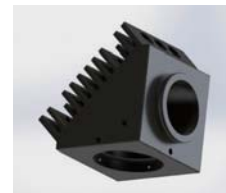
Filter Holder



Iris Diaphragm



Beam Steering Component



Beam-Splitting Component



Light Path Sealing Component

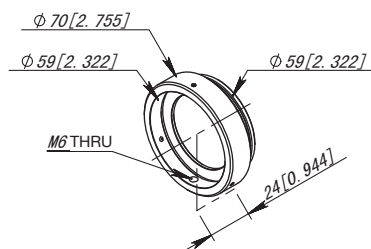


Fiber Coupling Component



## Lens Sets

### Lens Holders



Model	Aperture size(mm)	Outer diameter(mm)	Lens outer diameter(mm)	Condenser size (mm)
LLM50.8	46	70	50.8	59

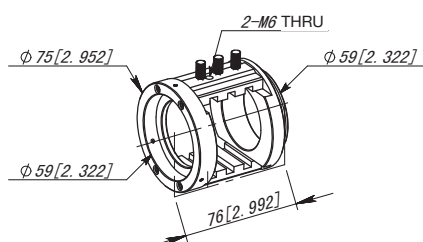
### Lens Set

Lens outer diameter (mm)	Material	Focal length(mm)	F#	Model
50.8 (min size:46mm)	Glass	75	1.6	LCG50.8-75
		100	2.2	LCG50.8-100
		150	3.3	LCG50.8-150
		200	4.3	LCG50.8-200
		250	5.4	LCG50.8-250
		300	6.5	LCG50.8-300
	Quartz	75	1.6	LCQ50.8-75
		100	2.2	LCQ50.8-100
		150	3.3	LCQ50.8-150
		200	4.3	LCQ50.8-200
		250	5.4	LCQ50.8-250
		300	6.5	LCQ50.8-300
		400	8.7	LCQ50.8-400

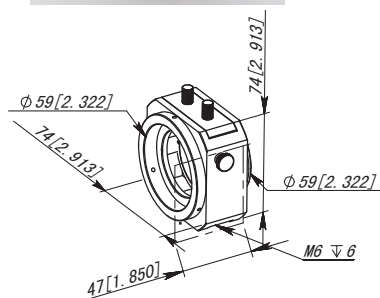
## Others

### Filter Holders

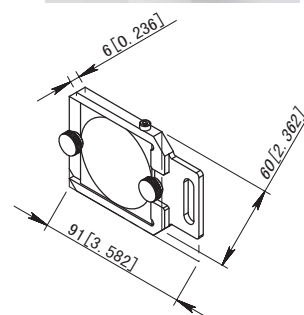
LFM1-50



LFM2-50



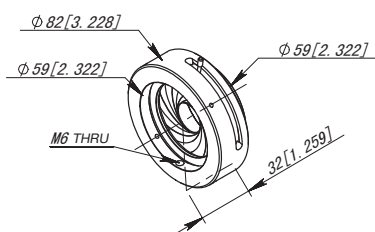
LFM3-50



These holders are open to allow easy access to the filters. You can insert various round or square filters simultaneously.

Model	Condensor size(mm)	Aperture size(mm)	Filter size(mm)		Mode
			Diam or square	Thickness max	
LFM1-50	59	46	50	20	Open
LFM2-50	59	46	50	10	
LFM3-50	-	-	50	10	

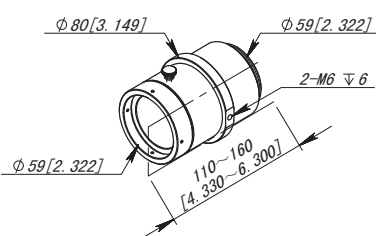
### Iris Diaphragm



These variable apertures are excellent for light attenuation and as lens aperture stops. A lever located on the top of the diaphragm controls the aperture. Do not use these in the unfiltered output of sources rated at more than 200 W. Use either a water filter, dichroic mirror or neutral density filter iris

Model	Cond.size(mm)	Cond.size(mm)	Length(mm)
LMI50	59	2~50	32

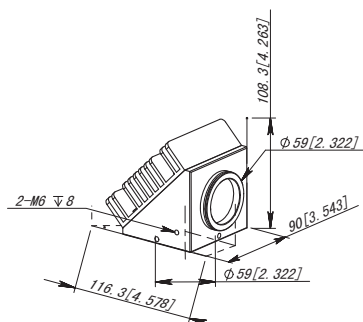
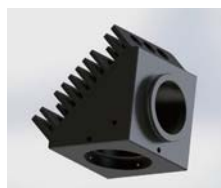
### Adjustable Spacer Tube



This flanged tube is useful in several ways. You can use it to enclose the beam path between separate components like monochromators and lamp housings. It also holds secondary focusing lenses beyond the condensers on your light sources.

Model	Cond.size (mm)	Aperture diameter (mm)	Outer diameter (mm)	Range of extension A (mm)
LHP150	59	46	80	110~160

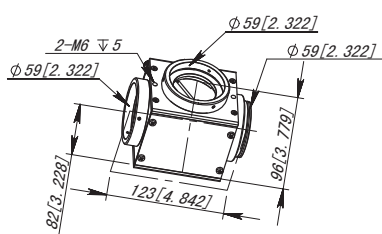
## 90° Beam Turner



Model	Condenser size(mm)	Aperture size(mm)	Spectral range(nm)	Mirror size	
				Diameter (mm)	Thickness (mm)
LBT46	59	46	UV-Vis	80	5

The design of many optical systems is simplified if the beam from the lamp housing can be turned to go up or down, or sometimes just turned 90 degrees in the horizontal plane. In other applications only a small portion of the spectrum is required, and the rest must be removed. For example the infrared from arc and halogen lamps should be removed before using optical fibers or irradiating some samples. These beam turners consist of a mirror and a holder placing the mirror under 45° in the collimated output beam of our light sources. You can reflect the entire lamp output or only a selected portion of the UV in the VIS spectrum. The beam turners couple directly to the lamp housing condensers or flanged optical accessories.

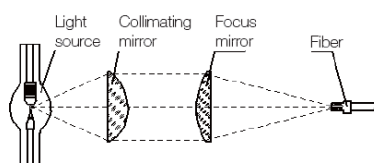
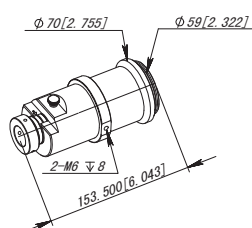
## Beam-Splitting Components



If user has limited wavelength requirement, please use this part by adding dichroic filter. It is very convenient for user to exchange optics. Dichroic filters are designed for high reflectance and polarization insensitivity over a limited spectral range. They pass one portion of the spectrum and block another. Use them to shape the output of a broadband source.

Model	Condenser size(mm)	Dichroic filter size(mm)	Thickness (mm)
LSM46	59	85x60	2

## Fiber Couplers



These assemblies focus the collimated light of our light sources into a filter or filter bundle. The one end has a male flange to couple to the light source; the other end accepts fiber bundles.

Model	Condenser size(mm)	Collimated mirror size(mm)	Lens	Fiber bundles
FCM-GF2.2	59	50.8	F/2.2 glass	Glass filter bundles with bundle diam. 8mm and 16mm
FCM-QF2.2	59	50.8	F/2.2 quartz	

# Light Sources for Spectroscopy

## LED light sources



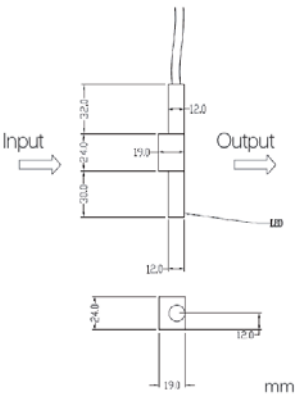
**Application**

Photocatalysis, ultraviolet analyzer biological genetic engineering, molecular genetics, medical and health, biological products, pharmaceutical research, health and epidemic prevention, dye chemical industry, petroleum chemical industry, textile industry, etc.

- Feature:**
- Efficient electro-optic conversion efficiency, energy conservation and environmental protection
  - Small volume, convenient to carry, convenient for system integration
  - Digital switch control, remote communication control, 1-100% light intensity adjustment
  - Set work plan for exposure time and light intensity.

### LED order information

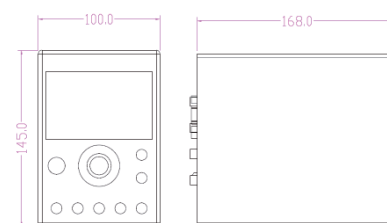
Model	Wavelength	Output Power	Iop (mA)	Model	Wavelength	Output Power	Iop(mA)
M265L	265nm	50μW	20	M620L	620nm	>240mW	700
M280L	280nm	50μW	20	M635L	635nm	>320mW	700
M310L	310nm	50μW	20	M660L	660nm	>280mW	350
M365L	365nm	>420mW	700	M690L	690nm	>240mW	350
M395L	395nm	>450mW	700	M710L	710nm	>200mW	350
M405L	405nm	>400 mW	700	M735L	735nm	>80mW	350
M425L	425nm	>280mW	700	M760L	760nm	>50mW	350
M450L	450nm	>320mW	700	M808L	808nm	>80mW	350
M470L	470nm	>240mW	700	M850L	850nm	>80mW	350
M515L	515nm	>180mW	700	M880L	880nm	>150mW	350
M525L	525nm	>180mW	700	M900L	900nm	>110mW	350
M550L	550nm	>200mW	700	M940L	940nm	>50mW	350
M560L	560nm	>150mW	700	M980L	980nm	>50mW	350
M590L	590nm	>80mW	700	M1020L	1020nm	>50mW	350



Light Sources for Spectroscopy

**LED power supply order information**

Model	MLED4-1	MLED4-2	MLED4-3	MLED4-4	MLED4-5
CH1(output current mA)	700	20	20	20	20
CH2(output current mA)	700	700	700	700	20
CH3(output current mA)	700	700	700	350	350
CH4(output current mA)	700	700	350	350	350
Radiation mode	Fixed irradiation: irradiation power (0-100%) adjusted (adjusting the duty ratio), modulation switch frequency 120 Hz, the irradiation time can be set maximum 9999.9 s, long time exposure can be realized by manual control.				
Control mode	Manual control, Digital signal control(turn on, turn off), RS232 control (turn on, turn off)				
Cooling	Fan				
Power supply	Input AC 110V~220V, output DC12~4A				
Environmental temperature	Working temperature: +5~+35℃, storage temperature: -10~+55℃				
Environmental humidity	Working/Storage: RH 20~80%				
Weight	1.5kg				



LED power supply Dimensions ( in mm )

**LED holder order information**

Model	MLED-POST1	MLED-POST2	MLED-POST3	MLED-POST4
LED number	1	2	3	4

LED holder can fix the LED conveniently, and the height( up to 200 mm), direction are adjustable. The MLED-POST1, MLED-POST2, MLED-POST3, MLED-POST4, It can fix one to four LED at the same time respectively.

# Application Solutions

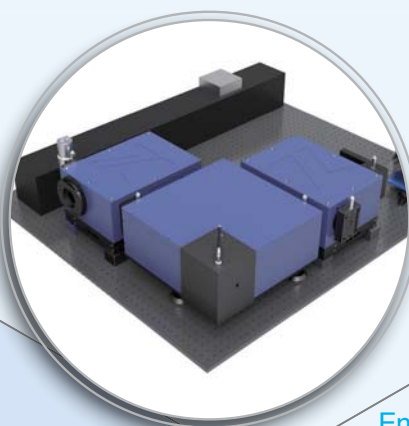
## Application

Zolix has many years of experience designing spectroscopy instruments. We are not only supply optical components, but also design optical systems; We offers high-performance spectrometers, spectrographs and detectors to many demanding spectroscopy applications including Fluorescence/Photoluminescence, Raman Spectroscopy, Absorbance, Transmittance and Reflectance, Plasma Emission Spectroscopy and Solar Cell Spectral Response/QE/IPCE etc.

Solar Cell Testing & Characterization



Fluorescence/Photoluminescence



Raman Spectroscopy

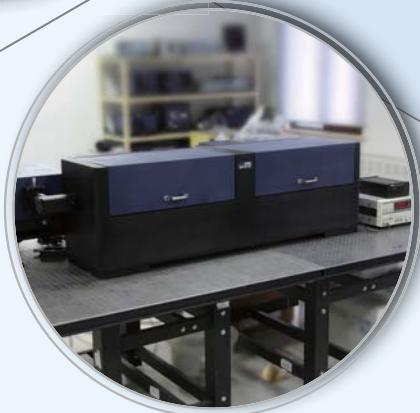


Emission Spectroscopy



## Application Solutions

Absorbance, Transmittance and Reflectance



Detector Spectral Responsivity Measurement

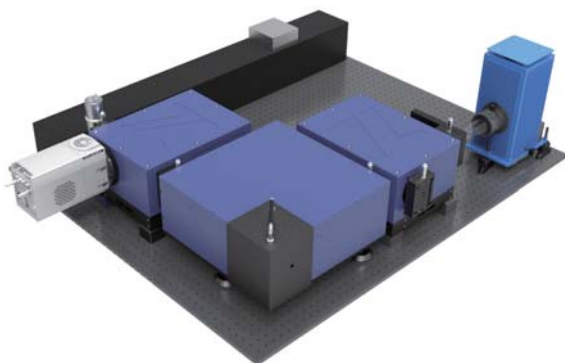




## Fluorescence/Photoluminescence

Fluorescence & Photoluminescence occur when a sample is excited by absorbing photons and then emits them with a decay time that is characteristic of the sample environment. Fluorescence is a term used by chemists when the absorbing and emitting species is an atom or molecule. Photoluminescence is the term physicists use to describe the absorption and emission of light by things such as semiconductors and nanotubes. Regardless of the terminology, when samples absorb photons and then emit them at a different wavelength the resultant light can be dispersed by a spectrograph, the spectrum can be detected by a device such as a CCD, and information can be gleaned about the sample

### OmniFluo Steady-State Fluorescence/ Photoluminescence System



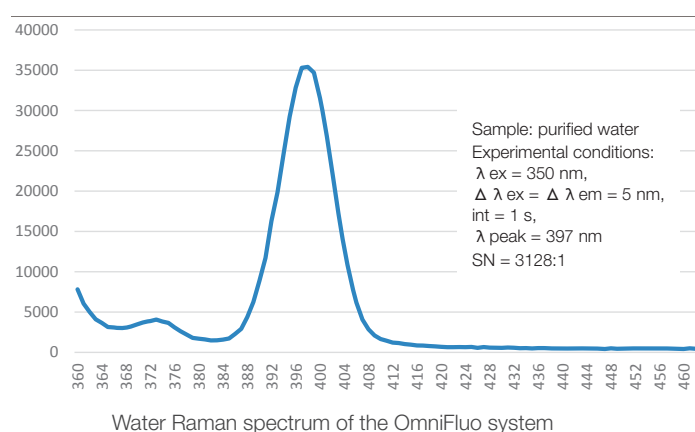
#### System Specifications

- Modular design, different function perfect combination to fit your specific needs
- Extended wavelength range with triple grating monochromators, 200 nm-2500 nm
- Emission spectroscopy correction function
- High output power, 150W or 500W Xenon light source
- Different Laser wavelength option, 266nm/325nm/375nm/405nm/442nm/532nm/785nm/1064nm.
- Quantum Yield-Expansion option
- EL-Expansion option
- Ultralow temperature accessory ( $\leq 10K$ )

#### Application

- Materials science (wide bandgap semiconductor materials luminescence properties testing), biology (chlorophyll and carotenoid testing)
- Biomedical (fluorescence diagnosis of malignant disease)
- Environment monitoring

#### System Performance (Water Raman S/N Ratio: 3128:1)



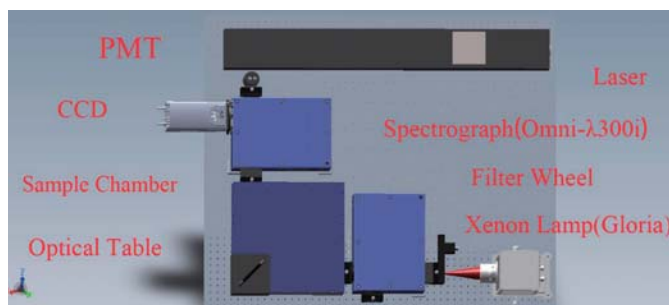
Model	OmniFluo			
Wavelength Range	200 nm to 2500 nm			
Fluorescence Spectral Resolution	0.1 nm			
Excitation Light Source	Tunable Light Source (150W/500W Xenon Light Source with 320mm monochromator)			
Excitation Output Bandwidth	0.1 nm to 30 nm			
Optional Laser	266 nm/325 nm/375 nm/405 nm/442 nm/532 nm/785 nm/1064 nm			
Optional Detector	TE-cooled CCD (2000*256)	TE-cooled InGaAs( 512*1)	PhotoMultiplier Tube	TE-cooled InGaAs
	200-1000 nm	800-2200 nm	200-870 nm	800-2500 nm
Data Acquisition Unit	-	-	single photon counting or lock-in amplifier	lock-in amplifier

Note: Above are the basic configuration, the specification depends on different requirements !

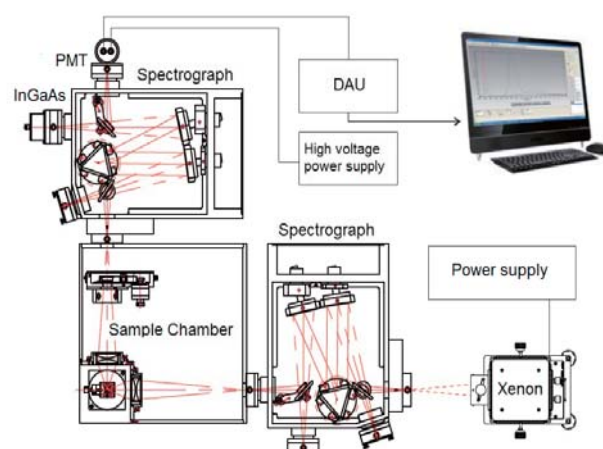
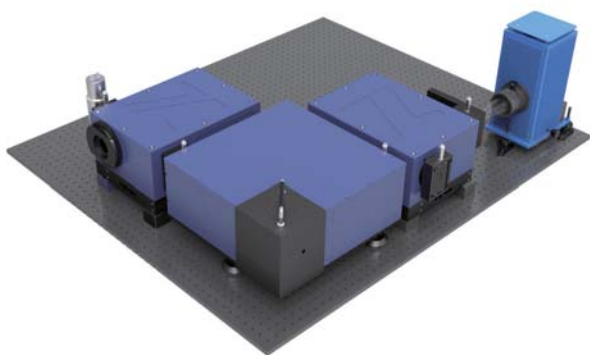


## System composition

1. Excitation light source: UV to NIR wavelength range light source or laser.
2. Spectroscopy acquisition: imaging calibration spectrograph/ monochromator, high sensitivity scientific CCD or single-channel detectors, and data acquisition unit.
3. Sample chamber: solid powders sample holder, ultralow temperature sample stage and so on.

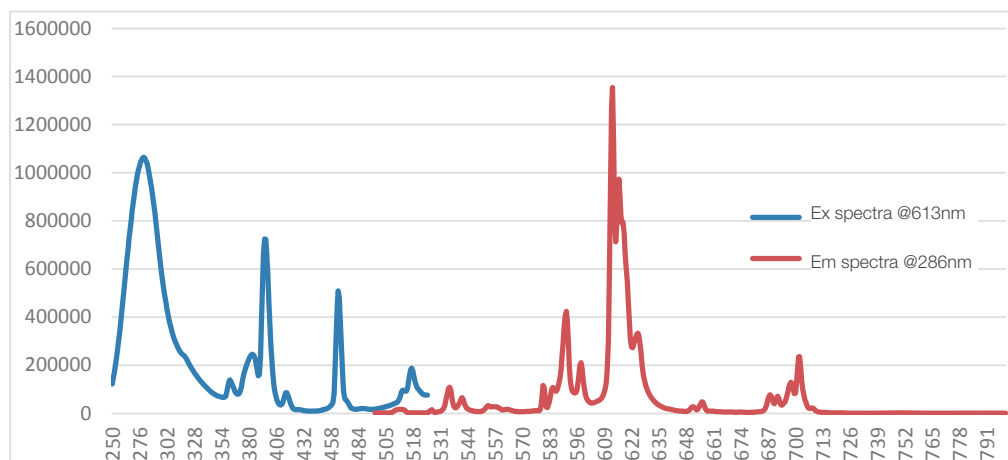


## OmniFluo Fluorescence Basic Configuration

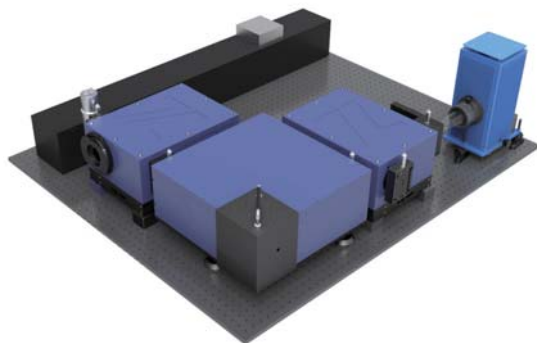


The basic configuration of OmniFluo is for fluorescence spectra and fluorescence excitation spectra measurement. And this configuration can be updated to NIR spectral range coverage.

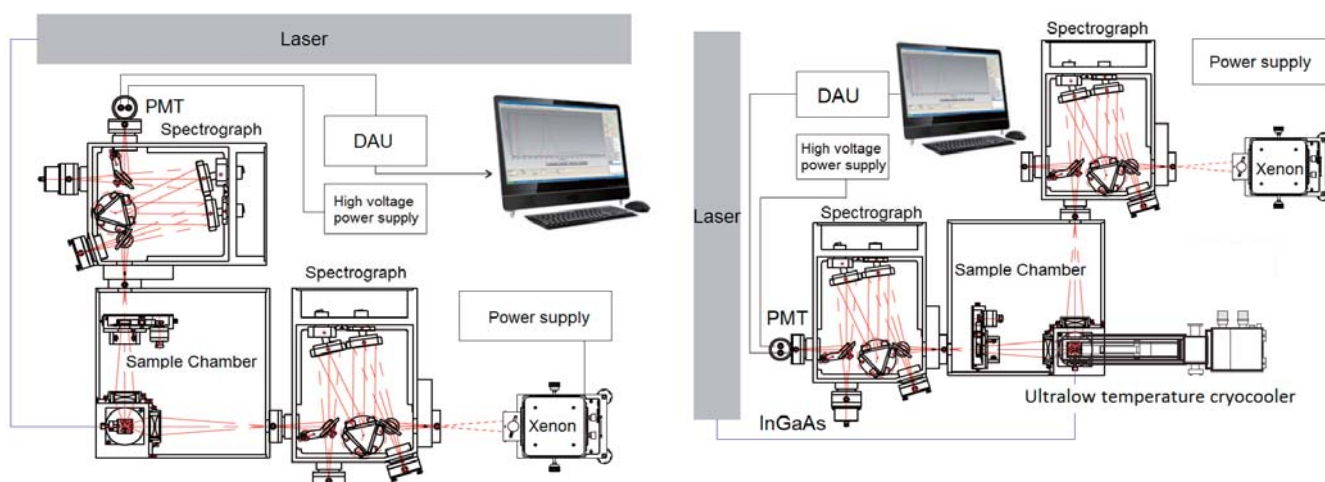
The excitation and emission spectra of rare earth material  $\text{Ca}_2\text{YSbO}_6$



## OmniFluo Photoluminescence(PL) Basic Configuration

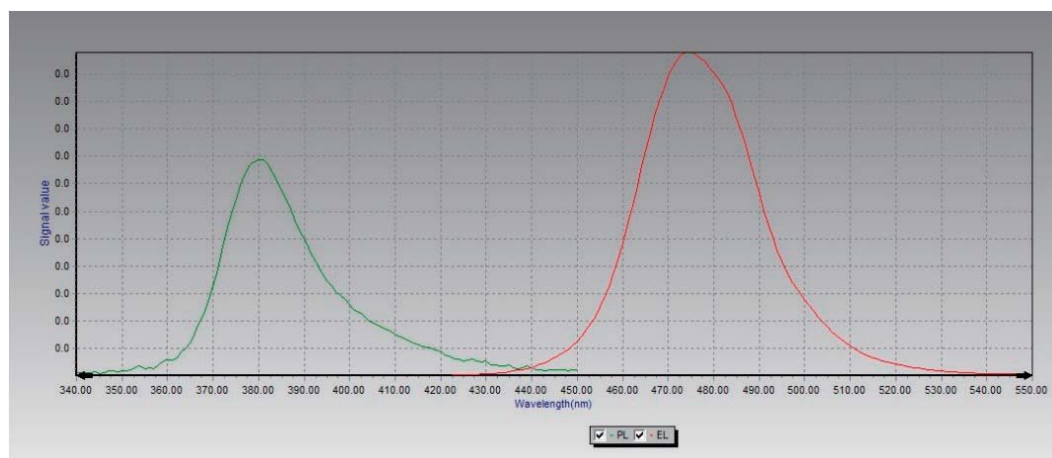


OmniFluo Photoluminescence(PL) System can realize the PL/PLE fluorescence spectra measurement. This system solves the energy shortage problem effectively for some experiment using Xenon lamp as the excitation light source. And you can add the sample temperature controllers for ultralow temperature testing condition, which is very convenient for rare earth luminescent material luminous performance research.



### Sample Test :

PL&EL of InGaN/GaN, excitation 325nm Laser with 30mW Power , Spectral Range: 340-700nm



(Green curve is PL and red curve is EL)

## Raman Spectroscopy

Raman spectroscopy is a non-destructive light scattering technique spanning a wide range of scientific and industrial applications. Most often, Raman spectroscopy is used to characterize or identify the chemical composition and structure of an unknown material. Incident laser light in the UV, visible or NIR, is scattered inelastically from molecular vibrational modes

### OmniRS Modular Raman Spectrometers

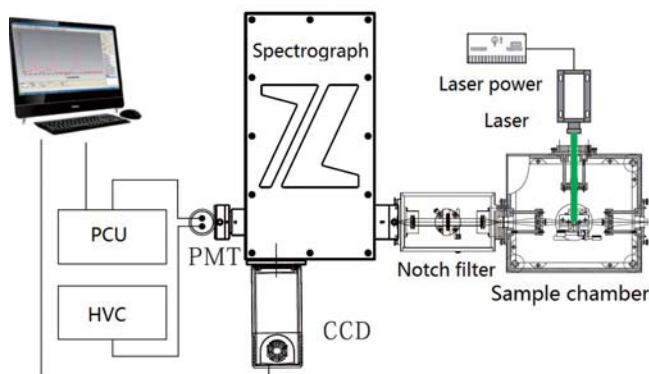


OmniRS series Raman spectrometer adopts the modular design, choose the excellent performance of optical components, according to the needs of the experiment, the choice of flexible required components, such as double monochromator, laser, data acquisition unit, etc., suitable for scientific research institutes, institutions of higher learning physics laboratory and chemical laboratory of Raman spectrum and fluorescence spectrum measurement, simple structure, easy to adjust and measurement, high sensitivity, good stability.

OmniRS series, the typical architecture of Raman spectroscopy system includes the following several parts: a laser, a spectrometer, sample chamber and holder (including XYZ adjustable sample holder, level liquid sample holder, solid and powder sample holder, etc.), CCD, software, a computer, optical table.

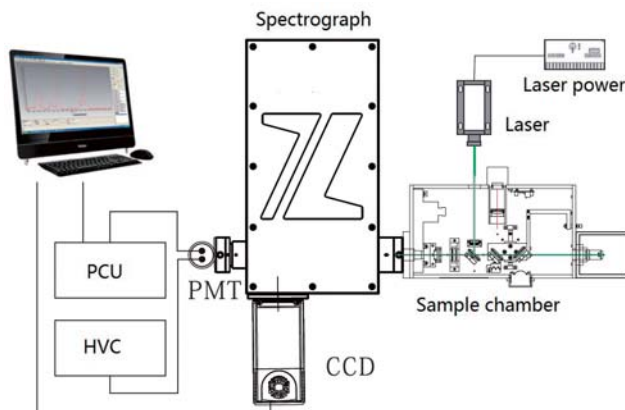
### OmniRS-532 Modular Raman Spectrometers

OmniRS-532 Modular Raman Spectrometers , using 532 nm wavelength DPSS solid state laser as the excitation light source, high resolution, low stray light of long focal length correction spectrometer as a beam splitter, a notch filter or edge cut-off filter as a notch filter, using scientific TE cooling CCD as the signal acquisition unit, equipped with a variety of accessories, applicable to the analysis of the liquid and solid samples.



### OmniRS-Micro Modular Microscopic Raman Spectrometers

OmniRS-Micro system uses microscopic optical path, compared with the conventional optical path, the microscopic optical path has a higher collection efficiency, makes the system has higher sensitivity.

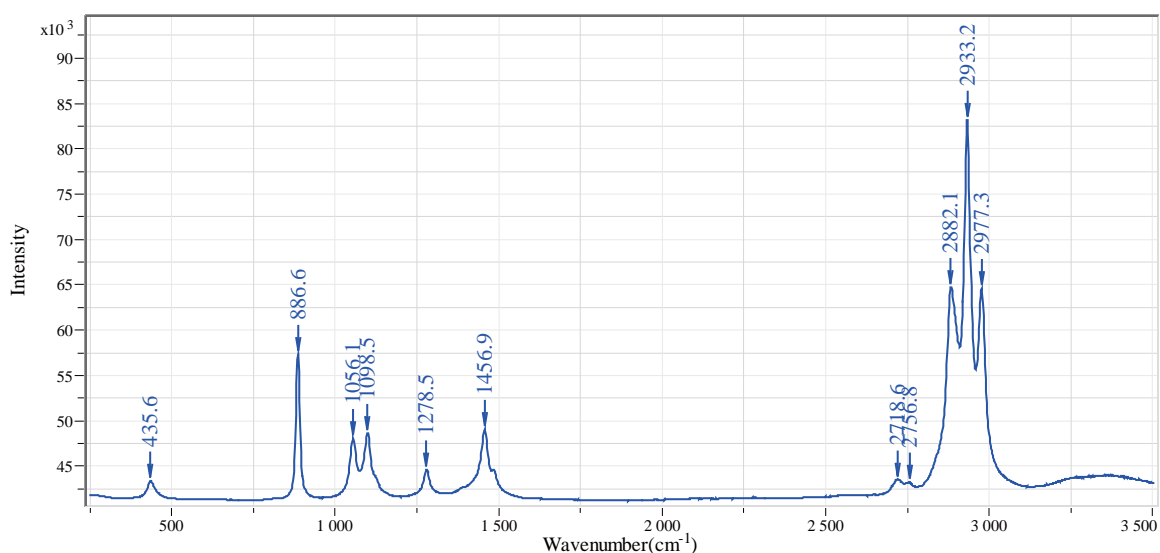


**Specification\***

Model**	OmniRS-532		OmniRS-Micro	
Raman Spectral range	200-4,000 cm <sup>-1</sup> (Typ.)			
Spectral resolution	≤5cm <sup>-1</sup>			
Laser	Standard: 532nm(100mW, TEM00) Optional: 488nm、 632.8nm、 785nm			
Spectrograph	Focal length: 500mm, imaging correction, triple grating turret, USB			
Spectrograph spectral range	200-2500nm			
Detector	TE cooling CCD 2000×256 200-1100nm	PMTH-S1-R1527 200-670nm Dark counts <100cps	TE cooling CCD 2000×256 200-1100nm	PMTH-S1-R1527 200-670nm Dark counts <100cps
Data Acquisition Unit	-	DCS202PC Photon counter rate : 5Mcps	-	DCS202PC Photon counter rate : 5Mcps
Microscopic	--		Microscopic optical path	

\*@532nm (Typ)

\*\*According to the different measurement requirements, the modular system can have a variety of options, please inquire!

**Measurement of Alcohol using OmniRS-Micro, laser 532 nm.**

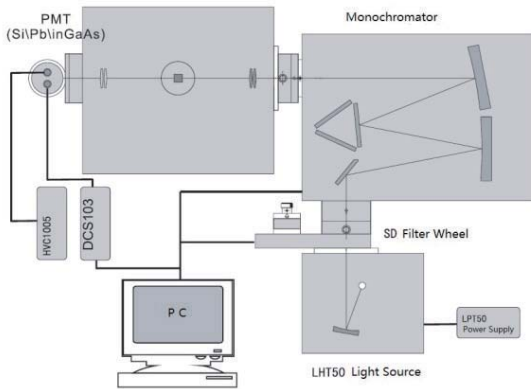
## Absorbance, Transmittance and Reflectance

Absorbance is a measure of the amount of light absorbed by a sample as a beam of light passes through it. In this process, a chemical species is excited from a lower to a higher energy level

Absorbance, transmittance, and reflectance measurements are typically made with.

When choosing a single-point detector, you must first consider the wavelength region to be studied. Photomultiplier tubes (PMTs) are used in the ultraviolet, silicon detectors in the visible, indium gallium arsenide (InGaAs) and lead sulfide detectors in the near-infrared region, and mercury cadmium telluride (MCT) in the mid-infrared region. Zolix sells single-point detectors made of each of these materials.

### OmniAS Absorbance, Transmittance and Reflectance Measurement System



#### Application

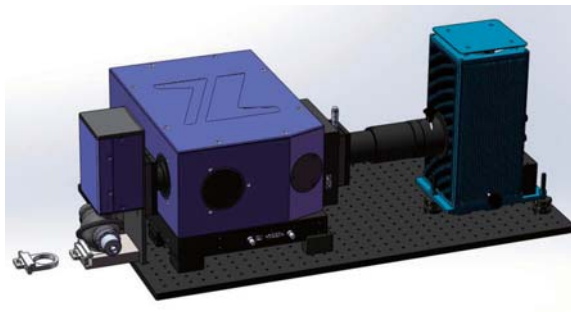
Transmission and reflection/absorption is optical element (such as optical material, filter, coating, etc.) and a variety of life material (glass, cloth, car sticker etc.) important indicators. The optical properties of OmniAS transmission and reflection/absorption spectra measurement system is aimed at the application requirement, the design of high integration, automated measurement system, it can help developers easily and fast in the laboratory QC or complete transmission/reflection spectral testing.

A generic absorbance/transmittance or reflectance measurement system consists of:

- light source
- Monochromator
- Detection system
- Filter wheel
- Sample chamber or system (such as a fiber optic probe)

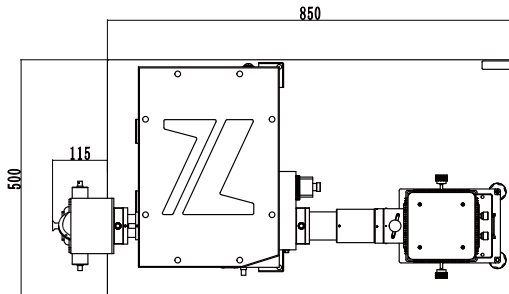
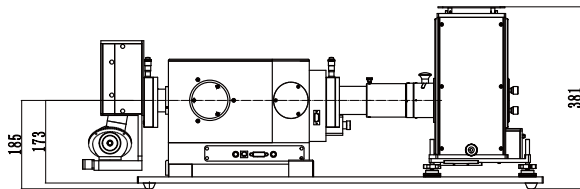
Other options are available upon request.

### Omni-DR300 Solid Powder Diffuse Reflectance Measurement System



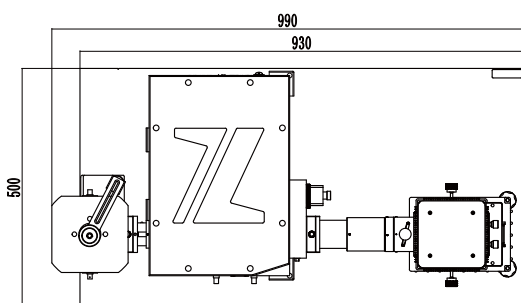
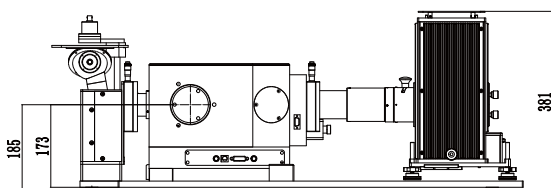
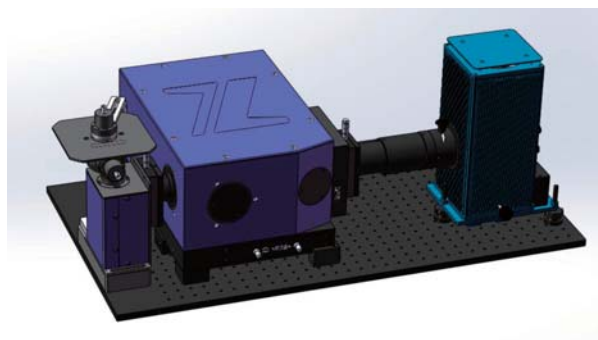
- Spectral range: 350-2500nm
- Spectral resolution: 2nm
- Step: 0.2-100nm
- Wavelength Accuracy:  $\pm 0.2\text{nm}$ (UV, visible),  $\pm 0.5\text{nm}$ (NIR)
- Photometric measurement accuracy: 1%(UV, visible), 2%(NIR)
- Photometric measurement repeatability: 1%
- Testing optical axis and the sample Angle: $<10^\circ$
- Sample size (typ.):  $\varnothing 10(\text{D}) * 3(\text{H})(\text{mm})$

This system adopts the wide band wavelength tunable monochromatic light source and integrating sphere, down-looking configurations, sample stage for small drawer sample box, convenient to place the powder samples, easy to replace.





## Omni-DR600 Plane Material Diffuse Reflectance & Transmittance Measurement System



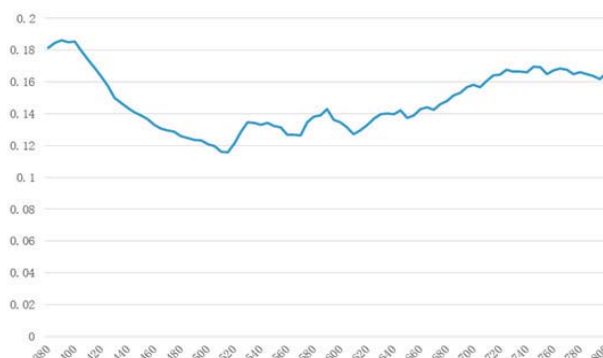
This system adopts the wide band wavelength tunable monochromatic light source and integrating sphere, up-looking configurations(8° focusing). Sample stage is 160 \* 160 mm, convenient placement of all kinds of plane object for testing, such as all kinds of functional fabric. At the same time, the system integration of the transmittance measurement probe, can measure all kinds of pervious to light material (thickness less 5 mm).

- Spectral range: 350-2500nm
- Spectral resolution: 2nm
- Step: 0.2-100nm
- Wavelength Accuracy:  $\pm 0.2\text{nm}$ (UV, visible),  $\pm 0.5\text{nm}$ (NIR)
- Photometric measurement accuracy: 1%(UV, visible), 2%(NIR)
- Photometric measurement repeatability: 1% (450nm-1800nm)
- Testing optical axis and the sample Angle: $<10^\circ$
- Sample size (typ.): Diameter $>15\text{mm}$ , thickness less 5 mm for transmittance measurement

### Sample Test

Spectral range: 380-800nm, Bandwidth: 5nm,

Grating: 1200g/mm 300nm



Reflectivity curve of perovskite sample

### Optical Lens Transmittance Measurement System



### Goggles Spectral & Integral Transmittance Measurement System



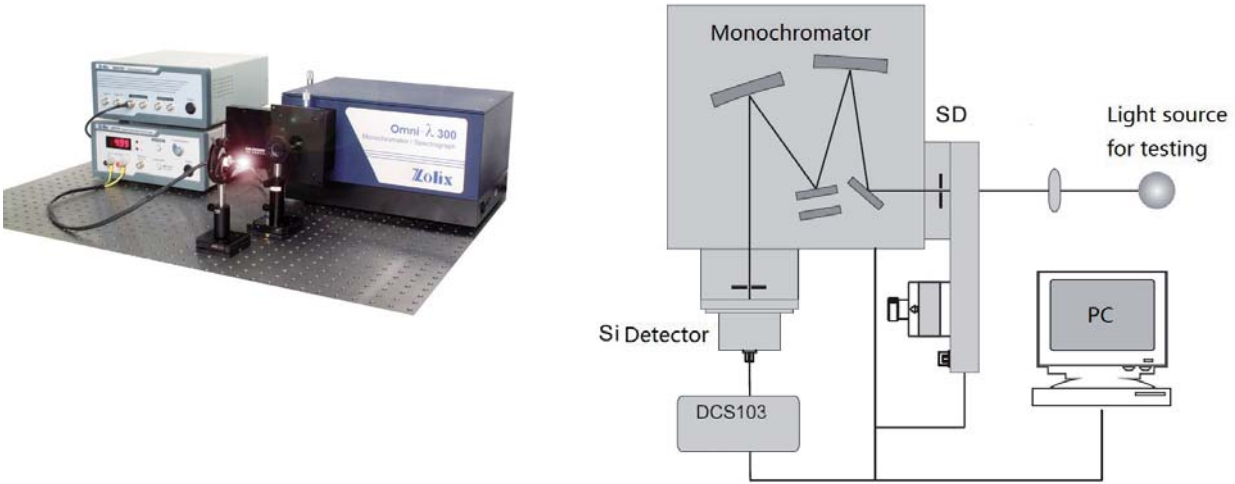
## Emission Spectroscopy

Light, such as incandescent lamp, fluorescent lamp, LED radiation spectrum and luminescence properties testing, is of great help to study its characteristics. Emission Spectroscopy measurement system not only can measure light source or other emission spectrum distribution, and can be obtained on the basis of the integral radiation flux, luminous flux and color coordinate, etc.

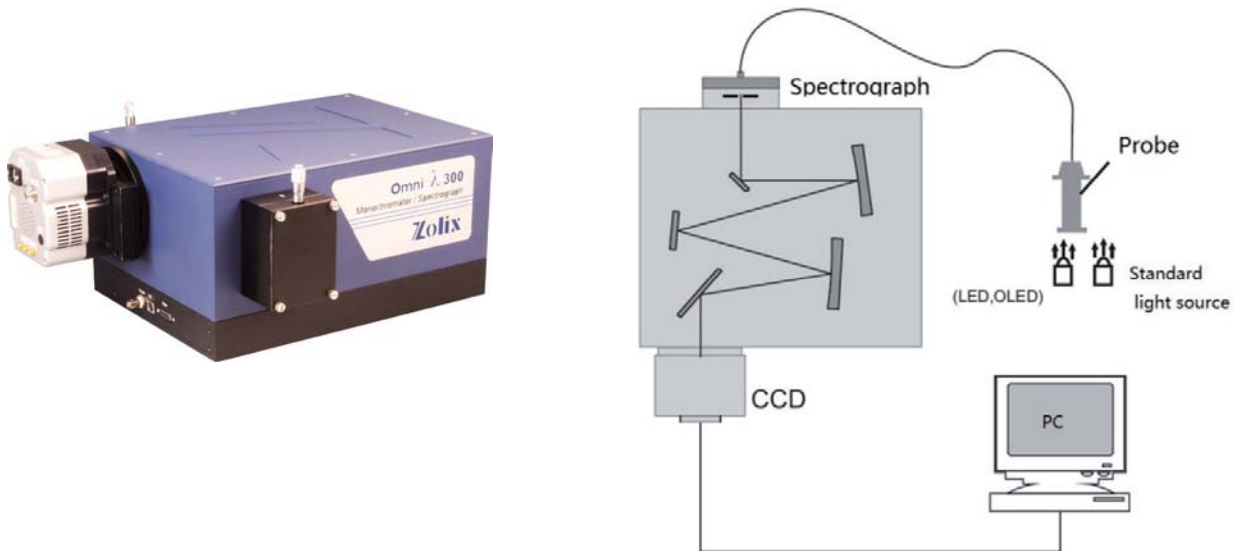
According to different characteristics of the radiation source, flexible choice test system, such as: broadband light source and LED often requires resolution is not high, it is recommended to use short focal length spectrometer/monochromator. Lasers, discharge, plasma, atomic emission spectrum, such as high resolution requirements, recommend the use of long focal length spectrometer/monochromator. Wide wavelength range (UV to the IR), the proposal uses double monochromator exports meet two detectors. Test wide spectrum light, need to use SD filter wheel multistage spectrum.

System composition: spectroscopic system + detection system, data acquisition and processing system + computer system and software system.

### OmniES-Scanning Emission Spectrum Measurement System



### OmniES-Spectrographic Emission Spectrum Measurement System



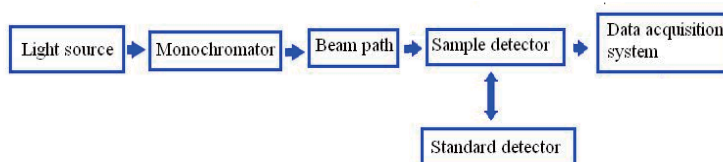


## Detector Spectral Responsivity Measurement

Photodetector is the sensor that could convert the optical radiation signal to the electrical signal, which is made from photoemission material. Most of the photodetectors have strong spectral selectivity in a certain Spectrum area. Therefore, for one photodetector, different wavelengths have different spectral responsivity. The spectral responsivity is an important parameter index for characterizing the photodetector performance.

And for the photoelectric material researching, the effect of some characteristics of the material itself such as doping density, lattice imperfection, absorption coefficient and minority carrier diffusion length on the photoelectric response capacity and the quantum efficiency could be obtained by measuring and analyzing the spectral responsivity data. That is very important and helpful for choosing better material and processing improvement.

### DSR100 Detector Responsivity Measurement System

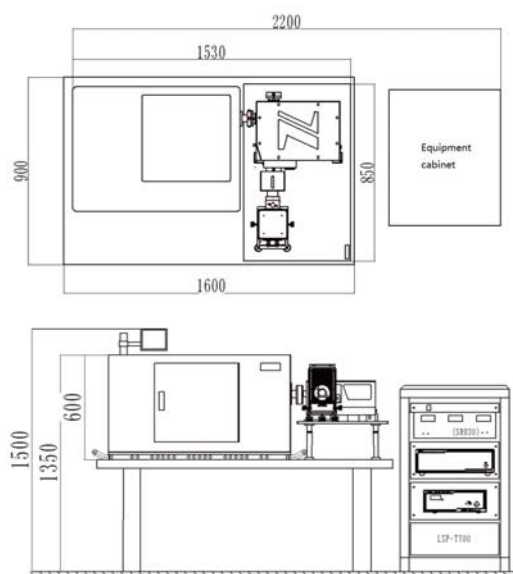


*Schematic diagram of alternative Measurement*

#### Application

- DUV detector
- Solar cell detector
- Optical fiber sensor
- IR photoelectric sensor

#### System Size



#### System Specifications

Model	DSR100-X150A-A	DSR100-T75SiN40-A
Wavelength Range	200~2500nm	350~14μm
Light source	UV enhanced Xenon light source	Tungsten-halogen lamp and silicon nitride light source
Repeatability*1	200~450 nm	≤ 2%
	450~1800nm	≤ 1%
	1.8~2.5 μm	≤ 2.5%
	2~6 μm	-
	6~14 μm	≤ 5%
Optical	UV enhanced	Silvering
Spot	≤ Φ1 mm	≤ Φ1 mm

\*1. Repeatability data is provided when the peak wavelength signal intensity is closing to the saturation value of the detector, and there are different standard detectors to cover the different wavelength range.

#### Standard Reference Detector Accessories

Model	Wavelength Range	Calibrated by
DSR-A1	200~1100 nm	National Institute of Metrology, China
DSR-A7	300~1100 nm	National Institute of Metrology, China
DSR-T1	350~1000 nm	NIST-traceable
DSR-T2	800~1800 nm	NIST-traceable
DSR-A2	800~2500 nm	Xi 'an Institute of Applied Optics, China
DSR-A8	1~14 μm	Xi 'an Institute of Applied Optics, China

## Sample Test

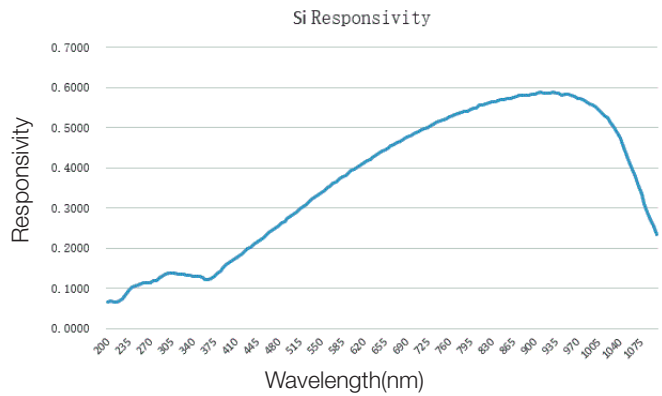
Si Detector

Wavelength range: 200-2500nm

Wavelength spacing: 10nm

Bias voltage: 1V

Chopper frequency: 330 Hz



## System Benefits

◆ Wide wavelength range (200~14000 nm, optional), widely applicable

◆ Turnkey system, Easy maintenance.

The system uses substitution method of measuring principle, which is designed into Turnkey mode. Users do not need to debug the system before experiments. Routine maintenance is also very simple.

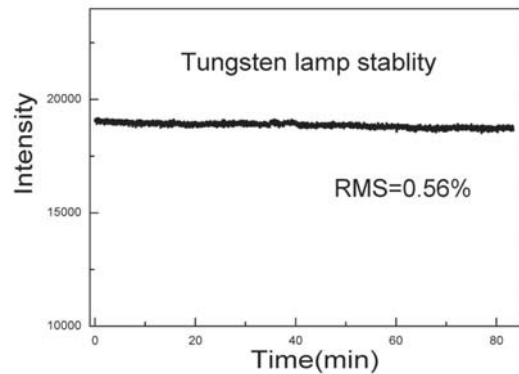
◆ CCD monitoring optical path for sample location.

The detectors with very small area can be located precisely by the system.

◆ perfect reflection optical design, optimization of spot quality

the perfect reflection optical system, you can get the quality parallel spot or much small convergency spot.

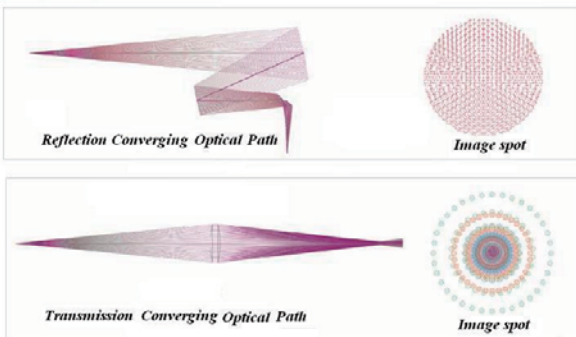
◆ High stability light source, reducing the background noise.



◆ Data export format supports third- party software.

DSR100 can save all original data, and the experimenter can save the data as the \*.txt, \*.xls\* and so on.

Converging optical path imaging effect



# Solar Cell Testing & Characterization

## Omni-Station Perovskite & DSSC IPCE Measurement System



### Samples:

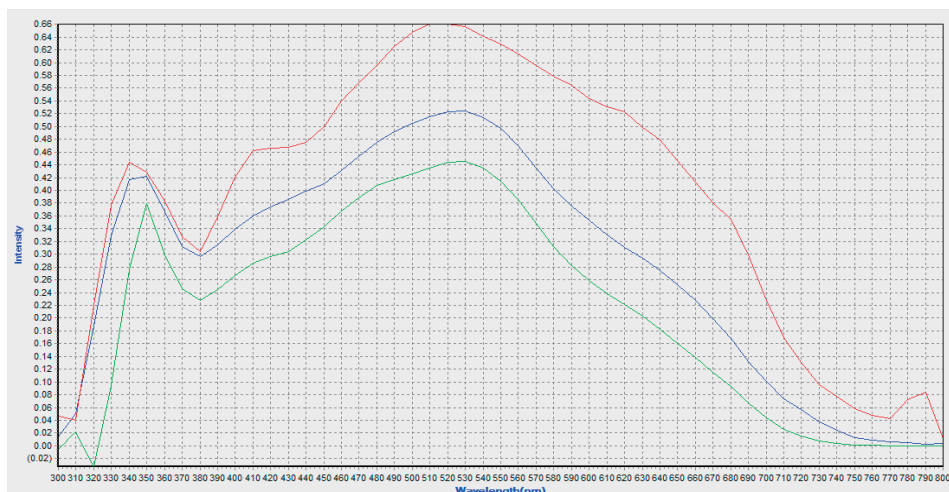
Si, mc-Si,  $\alpha$ -Si, GaAs, GaInP, InP, Ge, CdTe, CIS, CIGS, DSSC, Organic Solar Cell, Polymer Solar Cell, Perovskite Solar Cell and so on.

### Function:

External Quantum Efficiency, Internal Quantum Efficiency, Spectral Responsivity, Transmittance, reflectivity, Jsc.

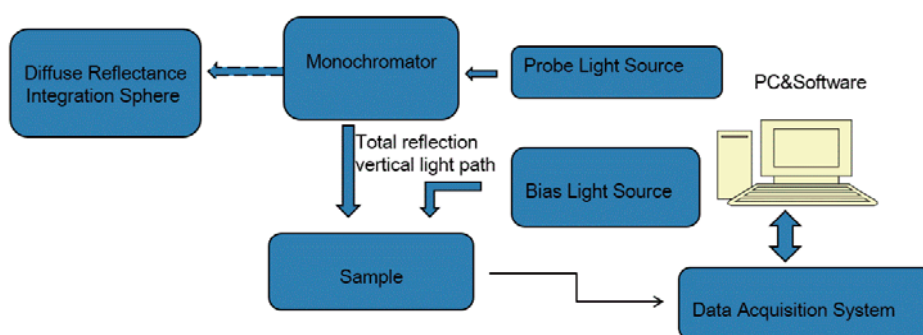
### Features:

- Spectral range: 300~1100 nm
- Measurement items: Spectral responsivity, QE, Short circuit current density.
- Sample: 100x100 mm
- Measurement: DC, DC with bias light;
- AC measurement mode as option
- Mapping function as option



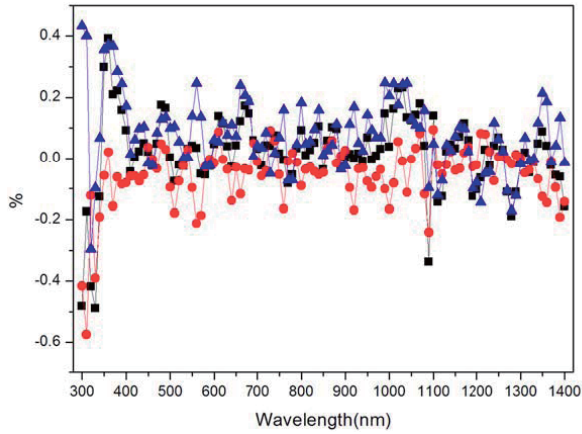
Note:  
Green AC(3.8Hz)+0.1Sun bias light  
Blue DC without bias light  
Red DC+0.1Sun bias light

### System Configuration

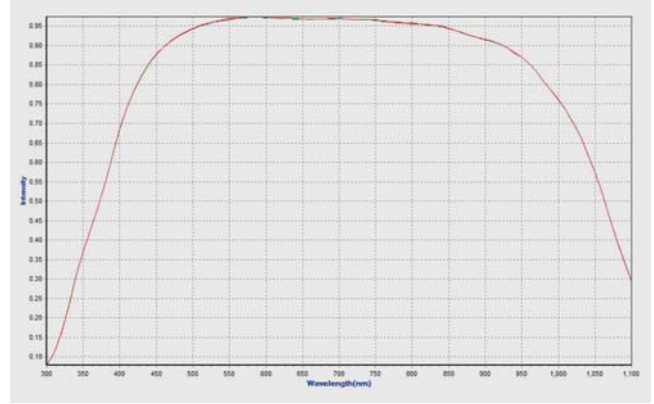


## System Performance

Repeatability : 300~400nm <0.6%; 400~1000nm <0.3%; Above 1000nm <0.6%



All wavelength repeatability test



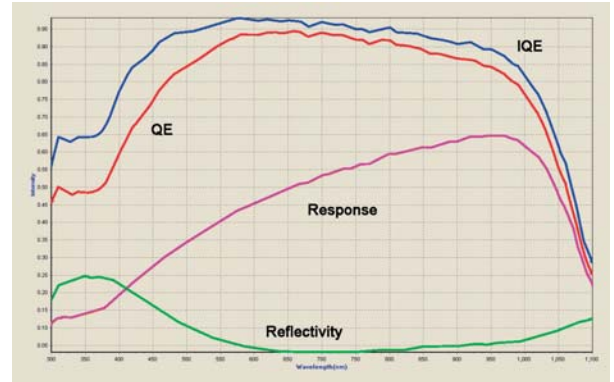
5 times test results, each time interval for an hour

## Sample Test

### Crystalline silicon Solar Cell measurement

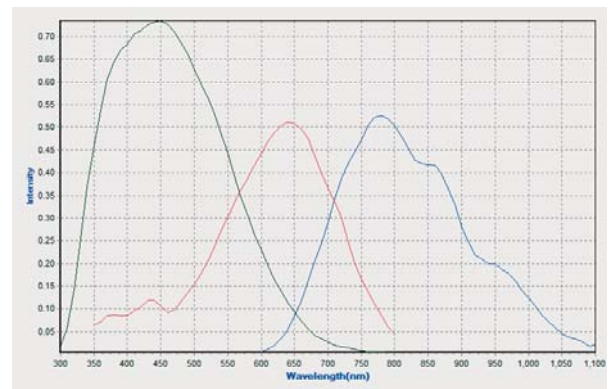
Measurement items: Spectral responsivity, EQE & IQE, Reflectivity, Short circuit current density.

- Sample description: Crystalline silicon Solar Cell 156 x 156 mm
- Spectral range: 300~1100 nm
- Light spot:  $\Phi$  10 mm
- Frequency: 170Hz
- Time constant: 100 ms
- Ambient temperature:  $25 \pm 1^\circ\text{C}$
- Mapping measurement: Room temperature, step 1 mm. Scanning time 5 min, testing wavelength 550 nm.



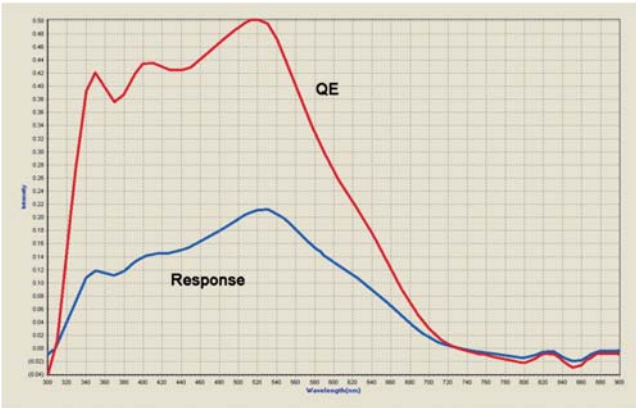
### a-Si Solar Cell measurement

- Spectral range: 300~1100 nm
- Light spot diameter  $\Phi$  2.5 mm
- Frequency: 180Hz
- Time constant: 300 ms
- Blue, red bias light
- Ambient temperature:  $25 \pm 1^\circ\text{C}$
- Measurement items: p-n Junction EQE, Short circuit current density.



Dye Sensitized Solar Cell Measurement

- Sample: DSSC, 10 x 10 mm
- Spectral range: 300~800 nm
- Light spot: diameter Φ 1.5 mm
- DC Mode
- Ambient temperature: 25±1℃
- Measurement items: IPCE, Spectral responsivity



Specifications

	Specification
Light Spot	2-10mm
Wavelength Range	300-1100nm
Step	Min.0.1nm, recommend 5nm
Filter Wheel	Automatic switching according to the wavelength
Calibration Detector	Calibrated silicon detector
Data Acquisition Sensitivity	100nA
Sample Holder	Suit for Sandwich DSSC
Optical Table Size	≥1200mmx800mm
PC and Software	Win7 system and Setup software



## Solar Simulator



### Ordering information:

Model	Description
<b>150 W AAA class solar simulator, 1000W/m<sup>2</sup>, 40mm Illumination diameter</b>	
Sirius-SS150A	light direction is up
Sirius-SS150A-D	light direction is down
Sirius-SS150A-L	light direction is left
Sirius-SS150A-R	light direction is right
<b>150 W ABA class solar simulator, 1000W/m<sup>2</sup>, 50mm Illumination diameter</b>	
Sirius-SS150	light direction is up
Sirius-SS150-D	light direction is down
Sirius-SS150-L	light direction is left
Sirius-SS150-R	light direction is right
<b>500W AAA class solar simulator, 1000W/m<sup>2</sup>, 75mm Illumination diameter</b>	
Sirius-SS500A	light direction is up
Sirius-SS500A-D	light direction is down
Sirius-SS500A-L	light direction is left
Sirius-SS500A-R	light direction is right
<b>500W ABA class solar simulator, 1000W/m<sup>2</sup>, 100mm Illumination diameter</b>	
Sirius-SS500	light direction is up
Sirius-SS500-D	light direction is down
Sirius-SS500-L	light direction is left
Sirius-SS500-R	light direction is right
<b>1000W AAA class solar simulator, 1000W/m<sup>2</sup>, 100mm Illumination diameter</b>	
Sirius-SS1000A	light direction is up
Sirius-SS1000A-D	light direction is down
Sirius-SS1000A-L	light direction is left
Sirius-SS1000A-R	light direction is right
<b>1000W ABA class solar simulator, 1000W/m<sup>2</sup>, 150mm Illumination diameter</b>	
Sirius-SS1000	light direction is up
Sirius-SS1000-D	light direction is down
Sirius-SS1000-L	light direction is left
Sirius-SS1000-R	light direction is right

Note: Please specify illumination direction

Solar simulators provide a broadband spectrum close to that of the sun from the UV to the IR. The main part of the solar simulator is a xenon arc lamp that reaches a color temperature of approximately 6000 K which is very close to sun light.

The main application of our solar simulator systems is the evaluation of power parameters of solar cells. For this type of measurements, the solar simulator is integrated into an IV measuring station. For setting the correct irradiance value we offer calibrated reference cells.

Further applications are the determination of Measurements can be made on a wide range of solar cell materials, such as: Monocrystal silicon, polycrystalline silicon,  $\alpha$ -Si, GaAs, GaInP, InP, Ge, CdTe, CIS, CIGS, DSSC, Organic Solar Cell, Polymer Solar Cell.

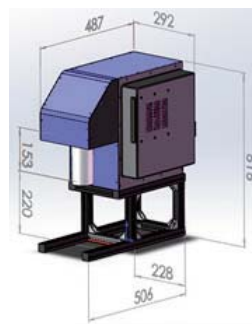
In addition the system is also applicable for a variety of solar cell structures, for example: Single junction, multi-junction, HIT, thin film, HPV and so on.

According to European ICE 60904-9 norm, solar simulators are tested for 3 different criteria and classified for each criterion into class A,B, or C. This results in a classification of the complete solar simulator, for example AAA or ABA. The criteria being tested are spectral match, non-uniformity and temporal stability of the light.

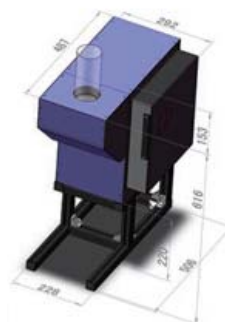
The main application of our solar simulator systems is the evaluation of power parameters of solar cells. For this type of measurements, the solar simulator is integrated into an IV measuring station. For setting the correct irradiance value we offer calibrated reference cells.

Further applications are the determination of plant growth, characterization of transparent components like sun protection glasses or the development of skin care products.

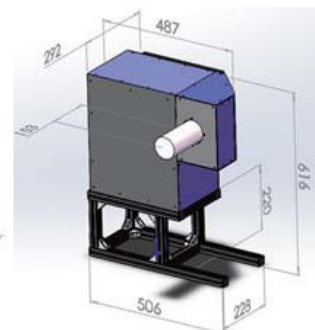
Spectral range (nm)	Irradiance range (%)	Irradiance (%)
400-500	13.9-23.1	18.5
500-600	15.1-25.1	20.1
600-700	13.7-22.9	18.3
700-800	11.1-18.5	14.8
800-900	9.2-15.3	12.2
900-1100	12.1-20.1	16.1



Sirius-SS150A-D 150W



Sirius-SS150A



Sirius-SS150A-L

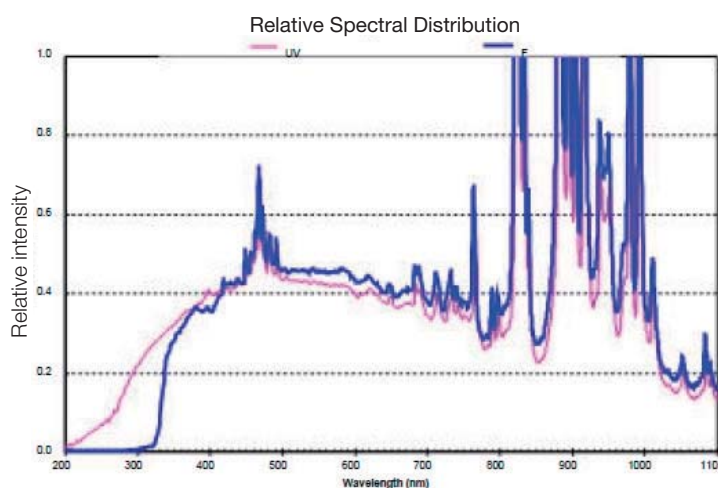
# Photocatalysis

## Sirius-300P 300W Photocatalysis Light Source



- High effective parabolic condenser ensure high collimation and high energy output
- The light height can be adjustable according to customer's requirement
- Light Source can be used as whole system or separately( housing and power supply can be divided into separate parts)
- The power supply can be turned off automatically by setting time
- High effective air-cooling has improved bulb lifetime
- High stability,unstability degree<1°

Sirius-300P series photocatalysis light source has high output from UV to NIR, Sirius-300P-F focus on simulated sunlight of visible light; Sirius-300P-UV has strong continuous output within 200-400nm and focus on applications of high UV requirements. Spectral curve as right picture:



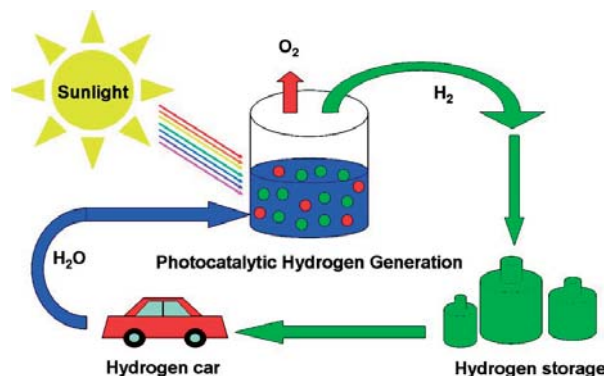
### Specification

Parameters	Sirius-300P	Sirius-300PU
Power Supply Voltage	AC190~240V 50Hz FUSE~5A	AC190~240V 50Hz FUSE~5A
Rated Power	300W(180~320W)	300W(180W~320W)
Current	DC 21A(10A~22A)	DC 21A(10A~22A)
Voltage	DC 14V(13~16V)	DC 14V(13~16V)
Output Power	50W	50W
Spectral Range	320~2500nm	200~2500nm
Output Powe(UV)<390nm(Watts)	2.6W	6.6W
Output Powe(IR) >770nm(Watts)	28.8	26.8
Output Power(VIS) 390-770nm(Lumens)	5000Lu	4500Lu
Power Intensity	5~15Sun@50mm	5~15Sun@50mm
Color Temperature	5600K	5050K
Bean Diameter	50mm adjustable	50mm adjustable
Divergence Angle of Parallel Light	Average 5°	Average 5°
Center Height of Output Light	70-220mm adjustable	70-220mm adjustable
Bulb Life(Hours)	1000H to 6000H	1000H to 6000H
Size	341mmx244mmx290mm	341mmx244mmx290mm
Weight(Kg)	11Kg	11Kg



### Application:

Photocatalysis, industrial catalysis, hydrogen aquatic photolysis, photochemical catalysis, photochemistry synthesis, optical degradation of pollutants, water pollution treatment, biological light, optical detection, various accelerated test simulated sunlight visible, ultraviolet band accelerated test and other research areas.



### Safety Tips

#### Automatic power off after open the cover

The system will automatic power off if the cover of power supply/housing is opened by man-made, it ensure user's safety.

#### Overheating protection function

The system will automatic power off when the housing temperature over safety, ensure lamp will work within safe condition and prolong life.

#### Trigger protection function

The system will ban on lighting if light is not successful trigger for ten seconds. Avoid long time continuous frequent light caused damage of trigger and bulb.

#### Bulb life tips

Most electric energy transform to heat when the bulb output attenuation is too large, bulb explosion danger is exist. Sirius300P can check bulb condition and give tips for customer to change bulb when it is danger.

### Light Source Accessories

Lens Holder



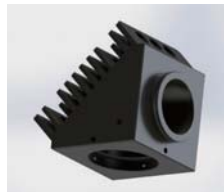
Filter Holder



Iris Diaphragm



Beam Steering Component



Beam-Splitting Component



Light Path Sealing Component



Fiber Coupling Component



As a manufacturer, we also have complete sets of scientific instruments and Opto-mechanics in addition to spectrographs, light sources, detectors etc. List of pictures as reference, welcome to contact us if you are interested in further information !

**Laser Confocal Raman Microspectrometer**

---Finder Vista



**Microscope Photoluminescence Spectrometer**

---Flex One



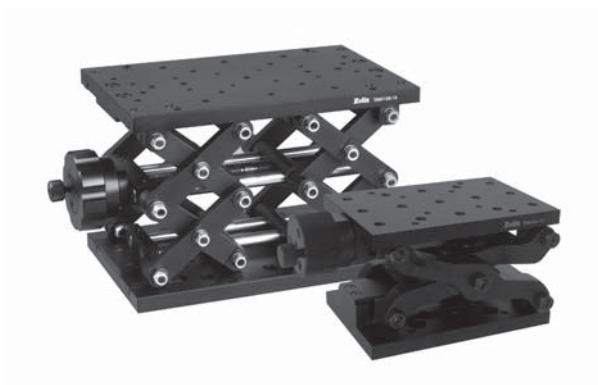
**Solid Damping Vibration Isolation Optical Table**



**Pneumatic Vibration Isolation Optical Table**



**Motorized/Manual Stage**



**Kinematic Mirror Mount**





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