



**InSIGHT™**

Princeton Instruments, the foremost innovator in CCD camera technology has teamed up with Acton Research Corporation, the world's leading designer of spectroscopic instrumentation, to create the InSight Integrated Spectroscopy System.

The InSight is a complete "out-of the box" solution that was designed to suit many applications. The system incorporates proprietary CCDs with an image corrected spectrograph that comes pre-aligned and focused allowing for effortless integration into your experiment. The InSight comes standard with a kinematic dual interchangeable grating turret and a deeply cooled CCD. The USB interface further enables true "plug-and-play" operation with the industry standard WinSpec software. There are a wide range of accessories available for use with the InSight, including fiber adapters, filter wheels and notch filter chambers.

**Applications:** Visible and UV Raman, Fluorescence, Luminescence, Multistripe Emission Spectroscopy

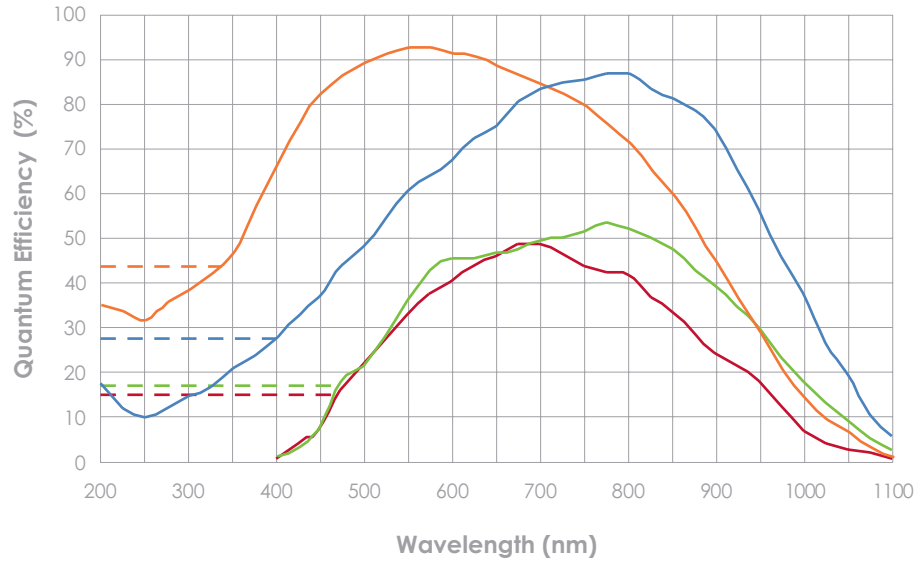
Features	Benefits
Permanent vacuum	Maintenance free operation for the life of the system
Deep thermoelectric cooling	Operate without the need for circulating liquid or an additional power supply
Compact design	Ideal for integration into applications where space is at a premium
Internal mounted shutter	Permits changing shutter later without removing slit and losing calibration
Exclusive CCD architecture	Provides industry's lowest-noise CCD system
Software-selectable amplifiers	Exclusive feature provides choice of superior sensitivity or superior SNR
Pre-aligned and focused digital spectroscopy solution	Quick and easy integration into your experimental setup
Image corrected optics	Offers the best spatial resolution for multi-stripe spectroscopy
USB 2.0 and RS 232 interface	Seamless, plug-n-play connection to PC notebooks and desktops No need for external control box or installing PCI cards
Renowned WinSpec software	Offers easy, yet sophisticated Windows® GUI controls Automates data acquisition, analysis and display
PICAM for VB, C, C++ and Scientific Toolkit for LabVIEW™	Respected application program interface provides a universal interface to all Princeton Instruments hardware
Wide range of accessories available	Including fiber adapters, filter wheels, sample chambers, and light sources
Manual or motorized slits	Provides the user the choice of either high accuracy slit mechanism
Two position detector mount	One flange with the ability to select best spectral or best spatial position
Acton Research high efficiency optical coatings	ARC #2000 Al + MgF <sub>2</sub> coatings deliver the highest throughput in the industry, guaranteeing 88 - 90% reflectance at 200 nm

CAMERA								
	InSight:100F		InSight:100R		InSight:100B		InSight:100BR	
CCD image sensor	front-illuminated		front-illuminated; deep depletion		back-illuminated		back-illuminated; deep depletion	
	Typical	Maximum	Typical	Maximum	Typical	Maximum	Typical	Maximum
Dark current @ -80 °C (e/p/s) @ (-40 °C) <sup>1</sup>	0.002 (0.1) <sup>1</sup>	0.004 (0.2) <sup>1</sup>	0.05	0.1	0.0025	0.005	0.1	0.2
	Front-illuminated				Back-illuminated			
	Typical		Maximum		Typical		Maximum	
System read noise @ 100 kHz readout @ 2 MHz readout	2.5 e- rms 12 e- rms		4 e- rms 15 e- rms		3.5 e- rms 13 e- rms		5 e- rms 16 e- rms	
Vertical shift rate (Software adjustable option)	15 µsec/row				30 µsec/row			
Spectral rate @ 100 kHz readout @ 2 MHz readout	61 spectra/sec (FVB) 505 spectra/sec (FVB) 1000 spectra/sec (1.0 mm high)				56 spectra/sec (FVB) 387 spectra/sec (FVB) 1000 spectra/sec (0.5 mm high)			
All InSight 100s								
CCD image sensor	Princeton Instruments exclusive, scientific grade 1, MPP device, optional UV coatings available							
CCD format	1340 x 100, 20 x 20 µm pixels, 26.8 x 2.0 mm imaging area							
	Minimum				Typical			
Spectrometric well capacity High sensitivity High capacity	250 ke- 800 ke-				300 ke- 1 Me-			
Deepest cooling temperature	-75°C (-35°C) <sup>1</sup>				-80°C (-40°C) <sup>1</sup>			
Thermostating precision	±0.05°C across entire temperature range							
	High		Mid		Low			
Software-selectable gains High sensitivity High capacity	1 e-/ct 4 e-/ct		2 e-/ct 8 e-/ct		4 e-/ct 16 e-/ct			
Dynamic range	16 bits							
Nonlinearity @ 100 kHz readout @ 2 MHz readout	< 1% < 2%							
SPECTROMETER								
Focal length	300 mm							
Aperture ratio	f/3.9							
Dispersion (RLD)	2.43 nm/mm with 1200 g/mm grating at 500 nm (nominal)							
Spectral resolution (10 µm slit x 4 mm high, 20 µm CCD pixel size)	0.10 nm with 1200 g/mm grating							
Spatial performance (Astigmatism)	60 µm							
Wavelength accuracy	±0.2 nm							
Wavelength repeatability	±0.05 nm							
Drive step size	0.0025 nm							
Focal plane size	27 mm wide x 14 mm high							
Grating size	68 mm x 68 mm							
Grating mount	Interchangeable, dual grating turret							
Computer interface	USB and RS232							

<sup>1</sup> Specifications in parenthesis are for InSight:100C model only. All others are the same as the InSight:100F.

All specifications subject to change without notice.

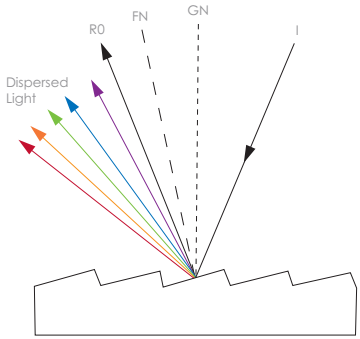
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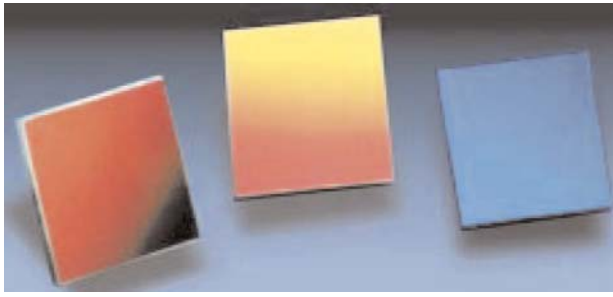
— InSight:100F    — InSight:100R    — InSight:100B    — InSight:100BR    - - - Optional UV coating (not available on InSight:100C)

Diffraction Gratings

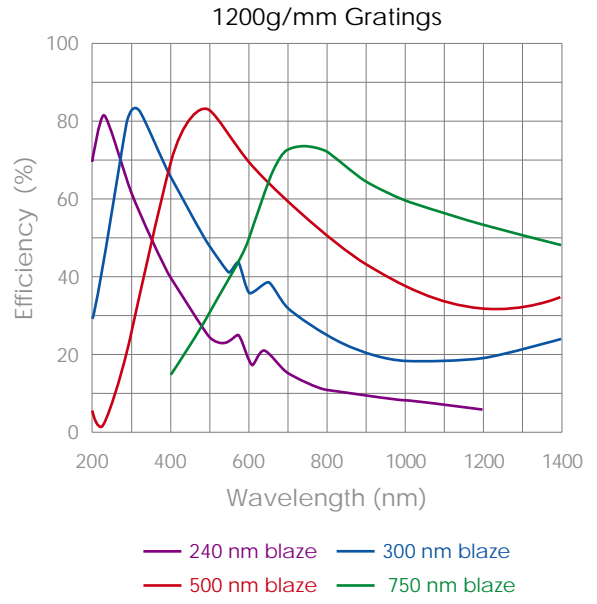
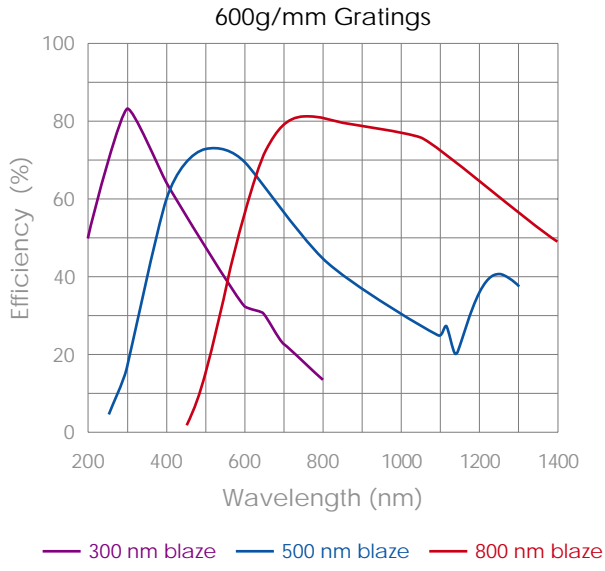
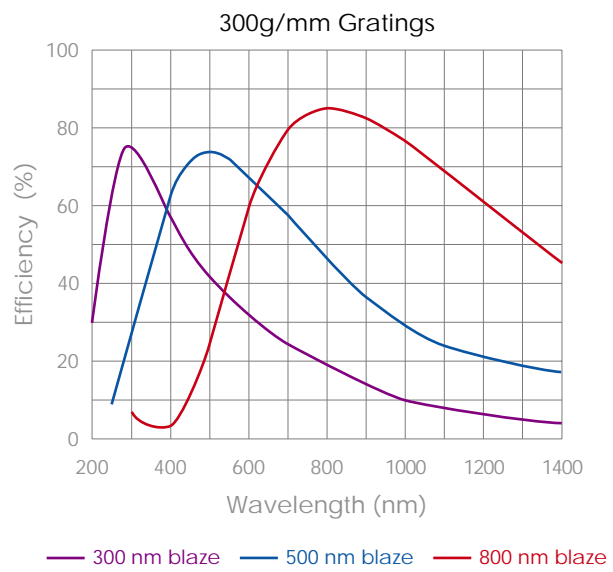
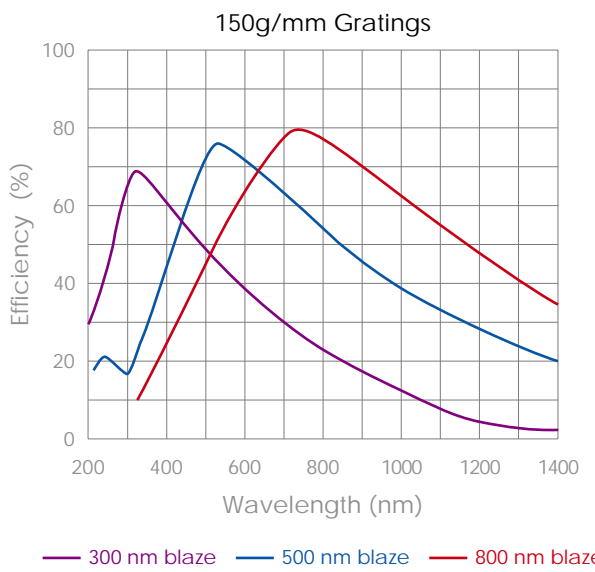
P/N	Groove Density	Blaze Wavelength	Range of Operation	Dispersion	Wavelength Coverage (26.8 mm)
1-05-600	50 g/mm	600 nm	400 - 800 nm	65.2 nm/mm	1748 nm
1-015-300	150 g/mm	300 nm	200 - 450 nm	21.6 nm/mm	579 nm
1-015-500		500nm	335 - 750 nm		
1-015-800		800 nm	535 nm - 1.2 μm		
1-030-500	300 g/mm	500 nm	335 - 750 nm	10.7 nm/mm	287 nm
1-030-750		750 nm	500 nm - 1.1 μm		
1-030-1		1 μm	650 nm - 1.5 μm		
1-060-300	600 g/mm	300 nm	200 - 450 nm	5.2 nm/mm	140 nm
1-060-500		500 nm	335 - 750 nm		
1-060-750		750 nm	500 nm - 1.1 μm		
1-060-1		1 μm	650 nm - 1.5 μm		
1-120-300	1200 g/mm	300 nm	200 - 450 nm	2.4 nm/mm	65 nm
1-120-500		500 nm	335 - 750 nm		
1-120-750		750 nm	500 nm - 1.1 μm		
1-120-HUV		Holographic, UV	185 - 375 nm		
1-120-HVIS		Holographic, VIS	300 - 800 nm		
1-180-500	1800 g/mm	500 nm	335 - 750 nm	1.7 nm/mm	44 nm
1-180-HUV		Holographic, UV	185 - 375 nm		
1-240-240	2400 g/mm	240 nm	185 - 375 nm	1.2 nm/mm	31 nm
1-240-HUV		Holographic,UV	185 - 375 nm		
1-240-HVIS		Holographic, VIS	300 - 800 nm		
1-360-240	3600 g/mm	240 nm	185 - 375 nm	0.7 nm/mm	18 nm
1-360-HUV		Holographic, UV	185 - 375 nm		

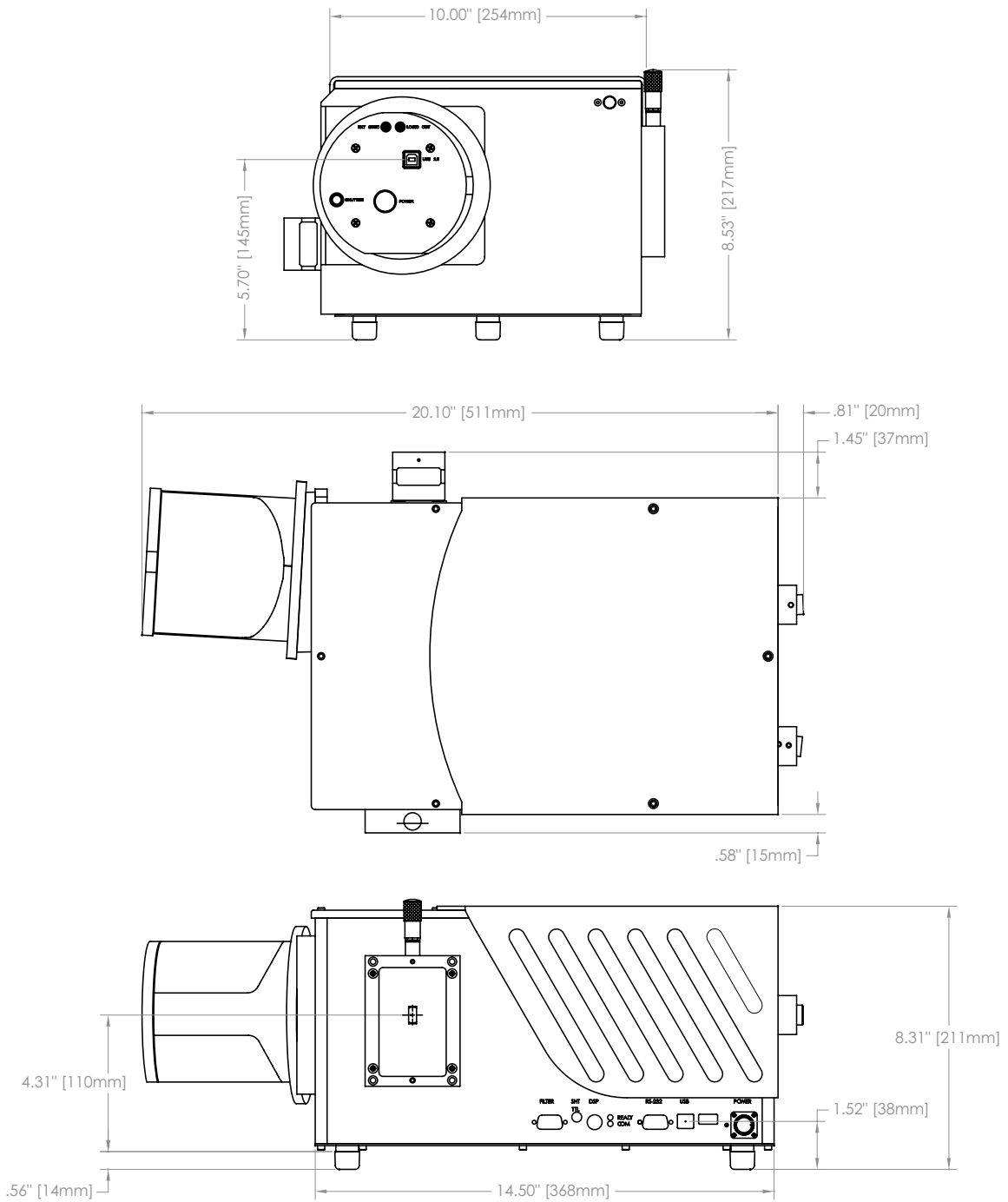


**Diffraction Grating**  
 GN: Grating Normal  
 FN: Facet Normal  
 I: Incident Light  
 RO : 0-Order Reflection



Grating Efficiency Curves





All Dimensions Nominal  
Measurements in Inches.

Princeton Instruments



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