

Spec-10:400

1340 x 400 imaging array | 20 x 20- μ m pixels



The Princeton Instruments Spec-10:400 utilizes high-performance, spectroscopic-format CCDs designed exclusively for Princeton Instruments. Liquid nitrogen cooling to -120°C minimizes dark charge, giving the best detection limits possible for long exposures. The 1340 x 400 imaging array with an 8-mm chip height is ideal for single- and multistripe spectroscopy applications. This detector delivers much higher resolution and sensitivity than industry-standard "1024 pixel" sensors. Another exclusive feature is the integration of software-selectable amplifiers that offer an easy choice of high sensitivity or high signal-to-noise ratio (SNR).

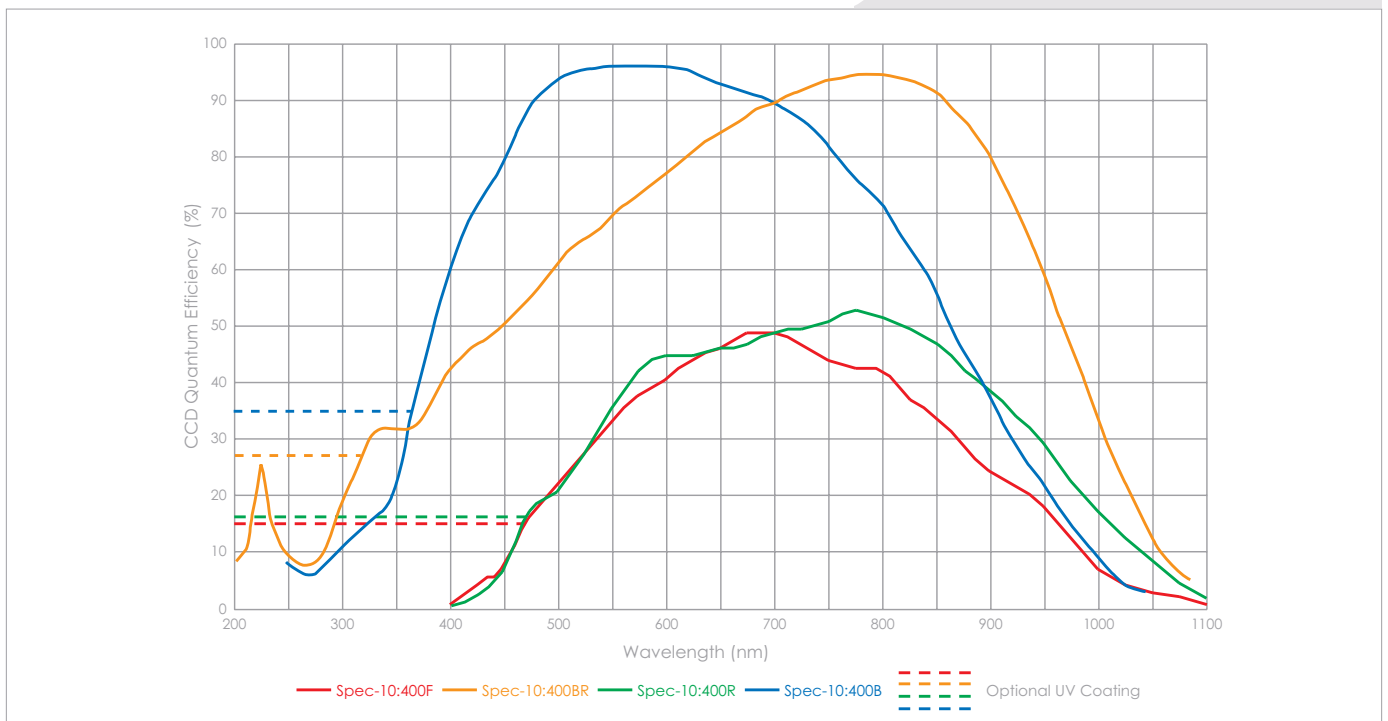
Features	Benefits
Cryogenic cooling	Eliminates noise attributable to dark current, even for long exposure times
1340 x 400 imaging array	Exclusive feature that provides superior resolution over industry-standard "1024 pixel" format
Exclusive CCD architecture	Provides industry's lowest-noise CCD system
20 x 20-μm pixels	Optimum pixel size for full well and high resolution
8-mm chip height	Ideal for rapid multistripe spectroscopy
Software-selectable amplifiers	Exclusive feature provides choice of superior sensitivity or superior SNR
Standard spectrometer interface	Will interface with most spectrometers
Optional dual digitizers	High speed provides fast data acquisition and easy focusing Slow scan provides lowest noise
"USB 2.0 interface" configuration	Seamless, plug-and-play connection to PC notebooks and desktops Easy OEM integration
"PCI interface" configuration	Industry standard for fast data transfer over long distances
WinSpec and PVCAM[®]	Offers easy-yet-sophisticated Windows [®] GUI controls Automates data acquisition, analysis and display
Linux[®] drivers and SITK[™] plug-in for National Instruments' LabVIEW[™]	Extends system utility

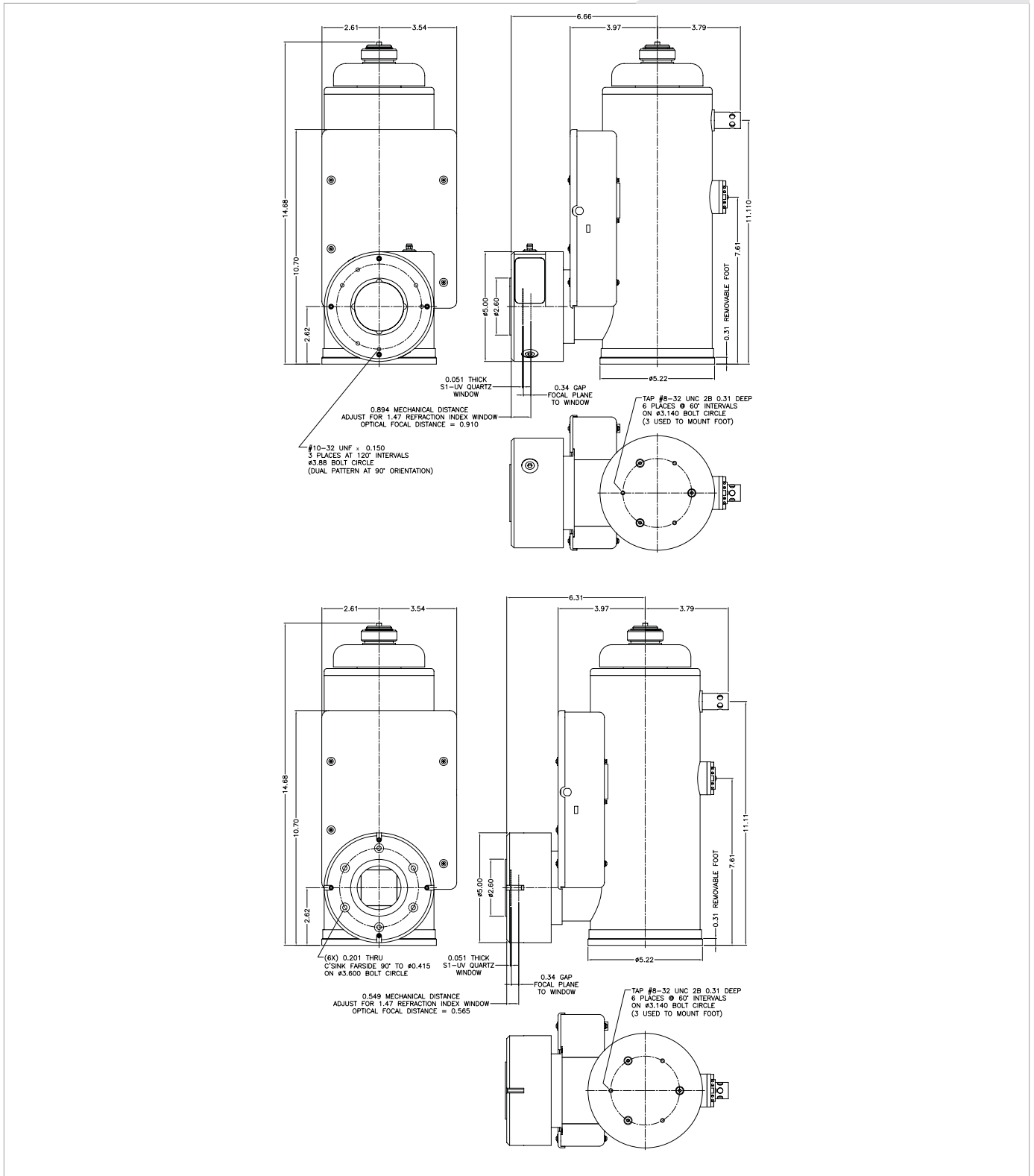
Spec-10:400 Specifications

	Spec-10:400F	Spec-10:400R	Spec-10:400B	Spec-10:400BR
CCD Image Sensor	front-illuminated	front-illuminated; deep depletion	back-illuminated	back-illuminated; deep depletion with anti- etaloning technology
Dark Current LN @ -120°C (e/p/hr)	Typical 0.3 Maximum 1	Typical 11 Maximum 36	Typical 0.3 Maximum 1	Typical 11 Maximum 36
	Front-illuminated		Back-illuminated	
	Typical	Maximum	Typical	Maximum
System Read Noise				
@ 100 kHz readout	3 e-rms	4 e-rms	3.5 e-rms	5 e-rms
@ 1 MHz readout	6 e-rms	8 e-rms	8 e-rms	10 e-rms
@ 2 MHz readout	12 e-rms	15 e-rms	13 e-rms	16 e-rms
Vertical shift rate	15 μsec/row			
Spectral rate¹				
@ 100 kHz	65 spectra/sec (FVB)			
@ 1 MHz	350 spectra/sec (FVB)			
@ 2 MHz	450 spectra/sec (FVB)			
@ 2 MHz	1000 spectra/sec (1.0 mm high)			
	All Spec-10:400s			
CCD Image Sensor	Princeton Instruments exclusive, scientific grade 1, MPP device, optional UV coatings available			
CCD Format	1340 x 400, 20 x 20 μm pixels, 26.8 x 8.0 mm imaging area			
	Minimum		Typical	
Spectrometric Well Capacity				
High Sensitivity	250 ke-		300 ke-	
High Capacity	800 ke-		1 Me-	
Deepest Cooling Temperature LN cooled (LN)	-120°C		-120°C	
Thermostat Precision	±0.05°C across entire temperature range			
Software-selectable gains	High		Mid	Low
High Sensitivity	1 e-/ct		2 e-/ct	4 e-/ct
High Capacity	4 e-/ct		8 e-/ct	16 e-/ct
Dynamic Range	16 bits			
Nonlinearity				
@ 100 kHz readout	< 1%			
@ 1 MHz readout	< 2%			
@ 2 MHz readout	< 2%			

Notes: All specifications subject to change.
¹ Fast spectral rates may require the use of custom timing modes.

QE Curves





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