

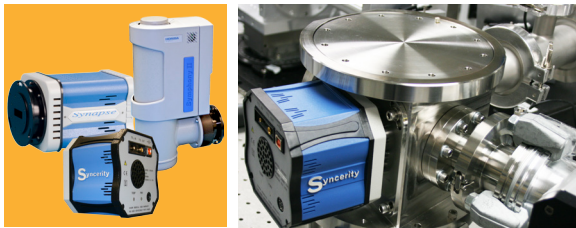


Syncerity™ VUV Camera

Back-illuminated Deep-cooled CCD

- ELEMENTAL ANALYSIS
- FLUORESCENCE
- GRATINGS & OEM SPECTROMETERS
- OPTICAL COMPONENTS
- FORENSICS
- PARTICLE CHARACTERIZATION
- R A M A N
- SPECTROSCOPIC ELLIPSOMETRY
- SPR IMAGING

OEM
Cameras

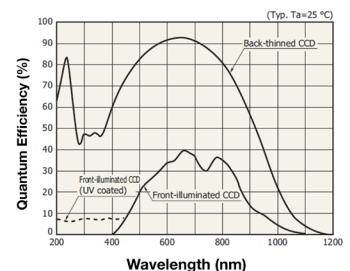
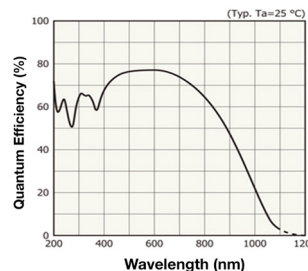
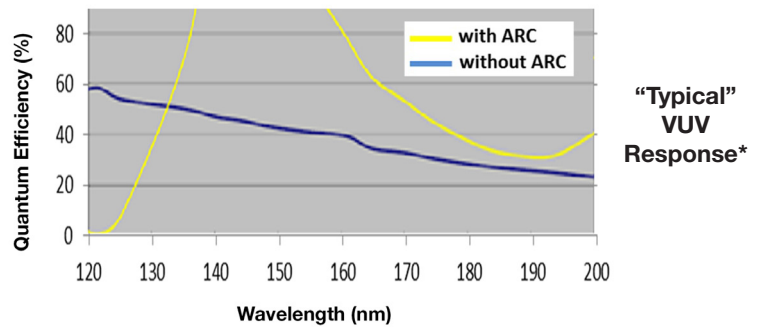


VUV Optimized Scientific Camera



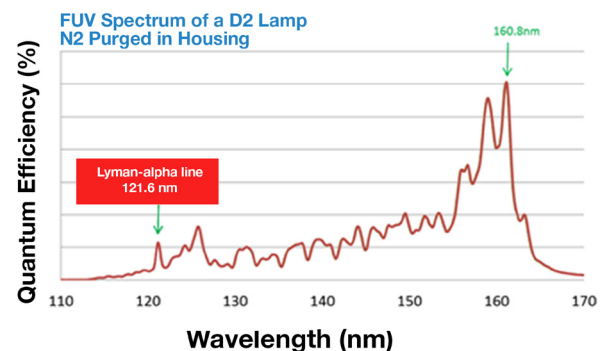
Up to
2048 x 512
Pixels

- High QE in VUV Range
58% @120 nm (no ARC)
- Attachable to High Vacuum Chamber
with Viton® O-Ring, down to $< 10^{-6}$ Torr
- TE-cooled to -50°C (Vacuum) or -30°C with N2 Purge
Low Dark Current, Low Noise



*This data is reference data only and is not guaranteed.
*Cameras provided without window have no warranty on CCD and need special handling under N2

| Q.E. | Standard Type-A | Special Type-B | Special Type-B |
|------------------|---|--------------------------|-----------------------|
| CCD pixel format | 2048 x 70 | 2048 x 256 2048 x 512 | 1024 x 128 |
| CCD pixel size | 14 x 14 μm | 12 x 12 μm | 24 x 24 μm |
| CCD height | 1 mm | 3 mm / 6 mm | 3 mm |
| CCD AR coating | Without AR coating for 115 nm - 200 nm With AR coating for 135 nm - 1100 nm | | |
| Window | No window or with MgF2 window | | |
| Flange | Special flange for vacuum chamber with Viton O-ring (Standard Syncerity cap + MgF2 window is also available) | | |



D2 Spectrum on a VUV Spectrograph

Syncerity™ Specifications (Syncerity VUV 2048 x 70 Back-illuminated - Standard)

| | |
|---|--|
| CCD sensor format | 2048 × 70 |
| Quantum efficiency at 20°C | See type A curve for VUV and UV-VIS QE responses |
| Pixel size | 14 μm × 14 μm |
| Image area | 28.7 mm × 0.98 mm; 100% fill factor |
| Deep thermoelectric cooling | -50°C under vacuum (10 ⁻⁶ mbar) with +25°C ambient or -30°C under N2 purging |
| Single pixel well capacity | 50 000 e ⁻ /pixel (minimum); 60 000 e ⁻ /pixel (typical) |
| Serial register full well capacity | 250 000 e ⁻ /pixel (minimum) 500 000 e ⁻ /pixel (typical output register saturation) |
| Scan rates | 45 kHz and 500 kHz |
| Readout noise (at 45 kHz and at -50°C)*¹ Readout noise (at 500 kHz and at -50°C)*¹ | 9 e ⁻ (typical) to 12 e ⁻ (maximum) 20 e ⁻ (typical) to 25 e ⁻ (maximum) |
| Maximum spectral rate | 20 Hz at 45 kHz scan rate 189 Hz at 500 kHz scan rate |
| Digitization | 16-bit ADC |
| Dynamic range (typical for single pixel)*² | 55 500:1 |
| Non-linearity (measured on each camera) | <0.15% (typical) at 45 kHz (0.4% maximum) <0.20% (typical) at 500 kHz (1% maximum) |
| Dark current at -50°C*³ (Note that pixel size = 14 μm) | 0.05 e ⁻ /pixel/s (typical) |
| Software-adjustable gains | 2, 4, and 10 e ⁻ /count at -50°C |
| Environmental conditions | <ul style="list-style-type: none"> • Operating temperature 0°C to 40°C ambient • Relative humidity <70% (non-condensing) • Storage temperature -25°C to 50°C |
| Weight | 1.769 kg (3.90 lb) |
| Dimensions | See mechanical drawings |
| Power requirements AC/DC power supply (provided) | 90-264 VAC, 47-63 Hz |
| Recommendation for OEM supplying camera to power directly: | <ul style="list-style-type: none"> • Pin: +9 V, ± 5%, 6.44 A maximum • Regulation: +8.55 V_{min}, +9 V_{typ}, +9.45 V_{max} • Ripple & noise: 200 mV_{pp} maximum |
| Minimum computer requirements | <ul style="list-style-type: none"> • 3.0 GHz single core or 2.4 GHz multi-core processor • 2 GB RAM • 32-bit or 64-bit compatible • 500 MB free hard disk space (additional disk space may be required depending on data-storage needs) • USB 2.0 high-speed host controller capable of sustained rate of 40 MB/s • Windows® (XP, Vista and 7) |

Syncerity - Other CCD Format Specifications: Contact us

2048 x 256

2048 x 512

1024 x 128

*1. Entire system noise measured for a single pixel

*2. Dynamic range is defined as Full Well/Readout Noise, measured at 45 kHz

*3. Averaged over CCD area, but excluding any regions of blemishes

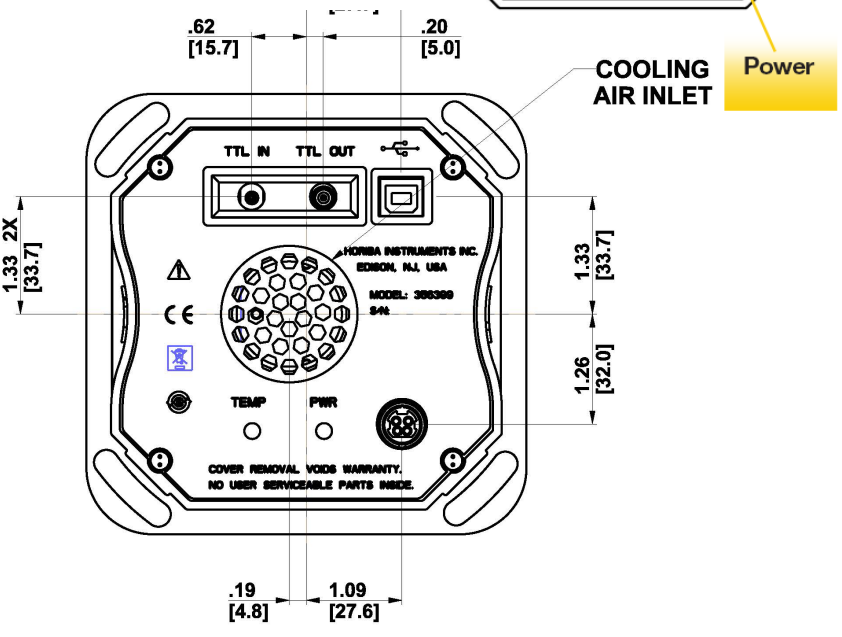
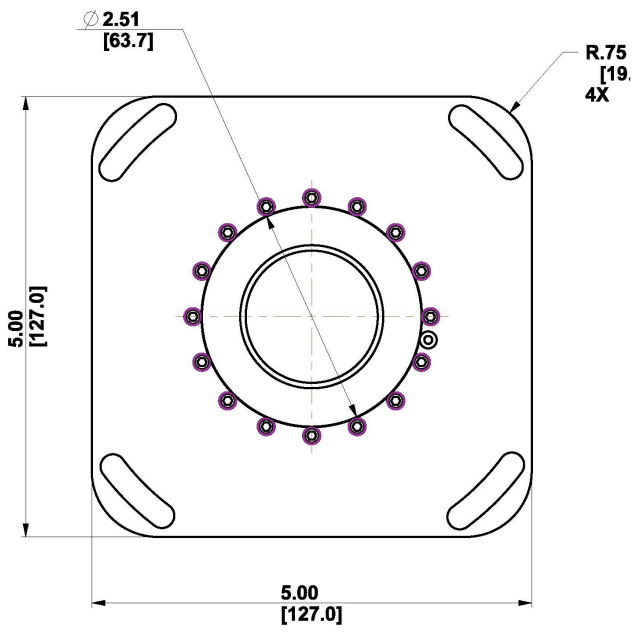
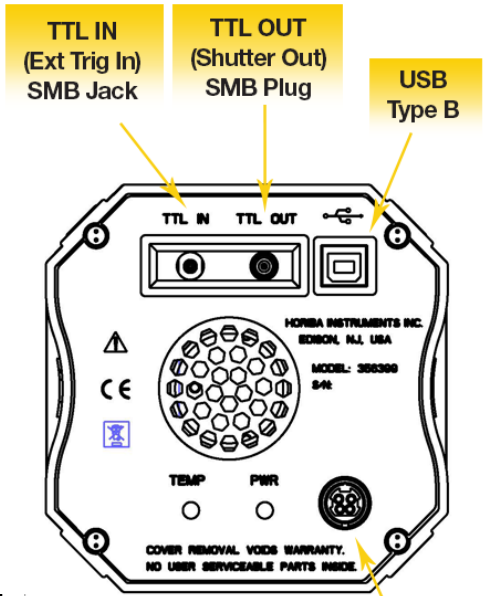
All specifications subject to change without notice.

Connecting to Sincerity

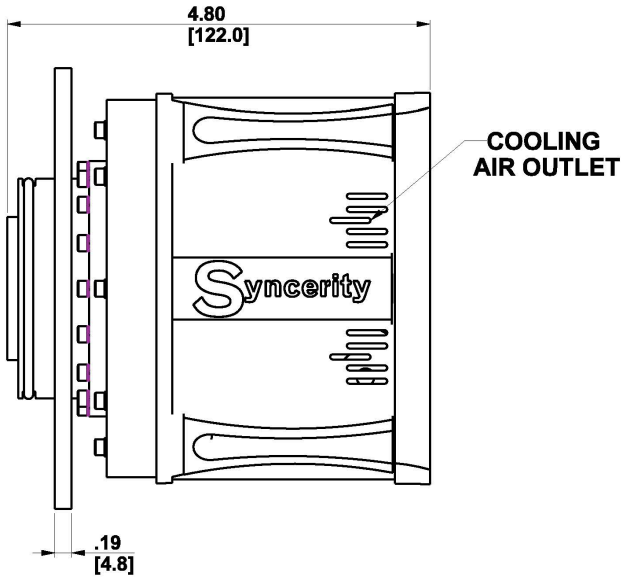
Power Interface:
 Connector Type: PDP-40, Mini PWR DIN, 4-Position, STR Plug

Camera Interface:
 Connector Type: USB Standard Type B

Sync I/O Connectors:
 Connector Type: SMB
 Input Jack: TTL IN (EXT TRIG In)
 Output Plug: TTL OUT (SHUTTER Out)



DIMENSIONS IN INCHES [MM]



**O-RING SIZE = #141
 ID X 2.506 [63.65] OD X .103 [2.62] CS**

Ordering Information

SYNCER-2048x70-VUV
Sincerity TE-cooled CCD Camera includes:

- | | |
|---------------------|------------------------------|
| USB 2.0 Camera Head | Specify: |
| AC-DC Power Supply | • With/without ARC |
| USB Cable | • With/without Vacuum Flange |
| CD Manual | • With/without MgF2 Window |

Other CCD Formats up to 2048 x 512: Contact us

- Optional:**
- UV-VIS CCD or VIS-NIR CCD (See Q.E. Curve)
 - Shutter Driver (SDrive-500 Shutter Control Unit with Cable)
 - CCD Shutter
 - TTL IN Trigger Cable
 - Printed Manual

VUV Sincerity

Latest Addition to our Growing Family of Scientific Cameras

HORIBA Scientific provides a wide variety of deep-cooled CCD cameras...offering “Best-in-Class” performance with respect to system read noise, linearity and dynamic range.

Sincerity



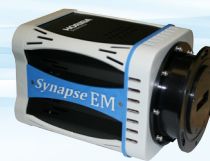
Low Cost -50°C
Air Cooled Camera

Synapse Plus



Deep-cooled -80°C to -100°C
Air or Water Cooled Camera

Synapse EM



EM CCD
Deep-cooled Camera

Symphony



LN2 Cooled Camera

Family of Vacuum Monochromators and CCD Spectrometers

Most popular models: H20UVL, H30UVL and TGS300

Typical applications: High Harmonic Generation, Plasma Characterization

HORIBA Scientific provides a wide variety of vacuum monochromators, spectrographs and VUV cameras. We can customize these VUV designs for OEM volume applications.

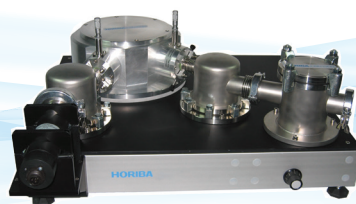
We cover a large spectral range from few nanometers to a few hundred nanometers. Based on toroidal, spherical or plane diffraction gratings, our systems provide unequaled throughput with competitive spectral resolution for Soft X-Ray, EUV, FUV and DUV applications.



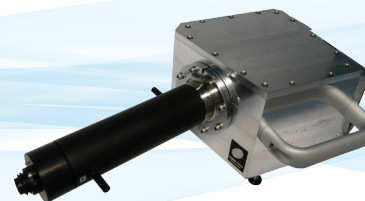
| Spectral range (nm) | | Energy range (eV) | | Model | Focal length (mm) | Grating Rotation | Single channel detector | Array Detector | Replica Available | VLS grating correction |
|---------------------|-----|-------------------|-------|---------|-------------------|------------------|-------------------------|----------------|-------------------|------------------------|
| Min | Max | Min | Max | | | | | | | |
| 9.5 | 110 | 11.3 | 135.5 | TGS300 | 300 | | | x | x | x |
| 50 | 300 | 4.1 | 24.8 | H30-UVL | 300 | x | x | x | x | x |
| 100 | 300 | 4.1 | 12.4 | H20-UVL | 200 | x | x | x | x | x |



VUV Monochromators



VUV Systems



VUV Accessories



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UK: +44 (0)20 8204 8142
China: +86 (0)21 6289 6060

<http://www.horiba.com/sincerityVUV>

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Italy: +39 2 5760 3050
Brazil: +55 11 2923-5440

Germany: +49 (0)89 4623 17-0
Japan: +81 (0)3 6206 4721
Other: +33 (0)1 69 74 72 00