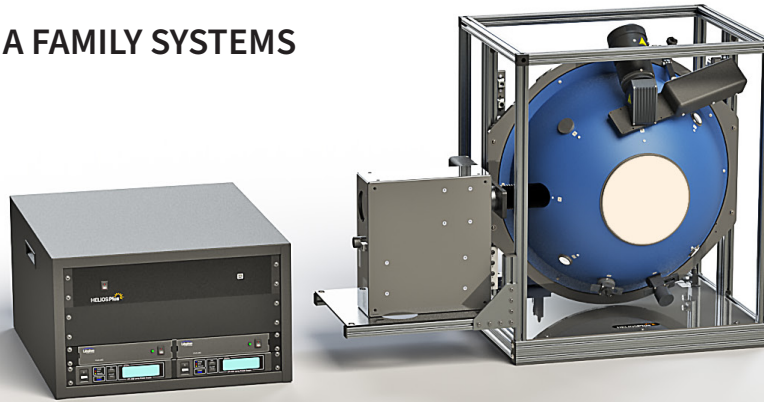


# Albedo Sunlight Levels and Halogen Spectrums for Full Testing Solutions

## HELIOSPlus-AMA A FAMILY SYSTEMS



### Great solution for “Test As You Fly” applications

The HELIOSPlus-AMA, A Family systems are the ultimate expression of uniform calibration source technology allowing you to test with spectrums and levels that are equivalent to solar outputs. Labsphere has employed Xenon sources for bluer spectrum for many years, but in the A Family we have added cutting edge Electrode-less Plasma lamps that have incredible lifetime, light level outputs and radiometric stability. The A Family allows you to confirm all your testing with classic QTH and augment your characterization to test as you fly in with traceable solar-like light.

### Value:

- Great solution for R&D and laboratory test flexibility
- Included CCD spectrometer and systems are compatible with Labsphere’s full family of CDS spectrometer technology
- All options in HELIOSPlus available for A Family inclusion: Easy to configure a system to meet your exact requirements
- High level of absolute characterization

### Performance:

- Test As You Fly: Solar and QTH spectrums from 250 - 2500 nm
  - Plasma 3000K to 5300K adjustable CCT and spectrum
  - Xenon 3000K to 6500K adjustable CCT and spectrum
- Large Dynamic Light Range:
  - >Albedo 0 (AM 0) down to night vision light levels
  - Cameras and sensors >16bit, actual 23bit (150dB)
  - Resolution and adjustability to meet customer’s application and budget needs
- UV (<380 nm) ranges available

# A Family: Air Mass (Albedo) Sunlight Source

Model Number	USLR-A20F-XAN2-P	USLR-A20F-XDN2-P	USLR-A20F-XMN2-P
Smart Part Number	A5XA-N2NN-NNAR-NS00-0000-P	A5XD-N2NN-NNAR-NS00-0000-P	A5XM-N2NN-NNAR-NS00-0000-P
<b>OPTICAL PERFORMANCE SPECIFICATIONS</b>			
<b>UNIFORMITY (EACH LAMP OR COMBINED)</b>			
Spatial Luminance Uniformity over Exit Port (f/4) - All Lamps On	+/-1.0%	+/-1.0%	+/-1.0%
Angular Uniform FOV (Full Angle) - Degrees / F# / NA - All Lamps On	+/-2.0% - 35° / 0.85 / 0.6	+/-2.0% - 35° / 0.85 / 0.6	+/-2.0% - 35° / 0.85 / 0.6
<b>QTH ONLY</b>			
Expected Luminance Output: cd/m <sup>2</sup>	3,800	3,800	3,800
Expected Illuminance at Port: lux	12,000	12,000	12,000
Est. Peak Radiance: W/m <sup>2</sup> -sr-um @ 0.95 um	100	100	100
Est. Peak Irradiance @ Port: Photons/s-m <sup>2</sup> -um @ 0.95um	4.70E+20	4.70E+20	4.70E+20
Minimum Resolution: lux	1.20E-03	1.09E+00	2.40E-01
Approximate Correlated Color Temperature (QTH)	3000K +/-50K	3000K +/-50K	3000K +/-50K
Typical Lamp Lifetimes (hrs)	>500hrs	>500hrs	>500hrs
Est. Lamp Degradation Over Lifetime (% & CCT Shift)	-10% & +/-200K	-10% & +/-200K	-10% & +/-200K
Est. Output Degradation over 50hrs (% & CCT Shift)	-1.0% & +/-20K	-1.0% & +/-20K	-1.0% & +/-20K
<b>PLASMA OR XENON ONLY</b>			
Expected Luminance Output: cd/m <sup>2</sup>	16,500	16,500	16,500
Expected Illuminance at Port: lux	51,000	51,000	51,000
Est. Peak Radiance: W/m <sup>2</sup> -sr-um @ 0.60um Pl @ 0.47 Xe	210	210	210
Est. Peak Irradiance @ Port: Photons/s-m <sup>2</sup> -um @ 0.60um Pl or 0.47 Xe	6.30E+20	6.30E+20	6.30E+20
Minimum Resolution: lux	5.10E-03	4.64E+00	1.02E-00
Approximate Correlated Color Temperature	6000K +200K/-400K	6000K +200K/-400K	6000K +200K/-400K
Plasma Rest Mode/Xenon Flicker (Peak-Peak/RMS/Hz) - Typical	4%/1%/5kHz	4%/1%/5kHz	4%/1%/5kHz
Plasma Test Mode (Peak-Peak/RMS/Hz) - 30 minutes (Rest 5min)	N/A	N/A	N/A
Installed Cold Mirror (330-750nm)	Yes	Yes	Yes
Typical Lamp Lifetimes (hrs) Plasma/Xenon	400	400	400
Est. Lamp Degradation Over Lifetime (% & CCT Shift)	-50% & -600K	-50% & -600K	-50% & -600K
Est. Output Degradation over 50hrs (% & CCT Shift)	-2.5% / -30K	-2.5% / -30K	-2.5% / -30K
<b>PLASMA/XENON &amp; QTH (Both Full Open VA)</b>			
Expected Luminance Output: cd/m <sup>2</sup>	20,000	20,000	20,000
Expected Illuminance at Port: lux	63,000	63,000	63,000
Est. Peak Radiance: W/m <sup>2</sup> -sr-um @ 0.60um Pl @ 0.47 Xe	280	280	280
Est. Peak Irradiance @ Port: Photons/s-m <sup>2</sup> -um @ 0.60um Pl @ 0.47 Xe	9.00E+20	9.00E+20	9.00E+20
Approximate Correlated Color Temperature (Xenon & QTH)	5100K +400K/-200K	5100K +400K/-200K	5100K +400K/-200K
<b>ATTENUATORS</b>			
Number of Steps in Attenuator Range	2.00E+06	1.20E+04	1.00E+04
Dynamic Range/Bits/dB - Full Range of System (both lamps)	4.41E+07/25/152	4.85E+04/15/93	2.20E+05/17/106
<b>INTEGRATING SPHERE</b>			
Coating / Material	Spectrafect®	Spectrafect	Spectrafect
Sphere Internal Diameter: Inches (Meters)	20 (0.5)	20 (0.5)	20 (0.5)
Frame Type	20 in Cage	20 in Cage	20 in Cage
Output Port Size: Inches (Meters)	8 (0.2)	8 (0.2)	8 (0.2)
<b>SYSTEM COMPONENTS</b>			
QTH Lamps Internal (#, Wattage)	(0)	(0)	(0)
QTH Lamps External (#, Wattage)	(1) 150	(1) 150	(1) 150
Xenon Lamp & Housing	300W	300W	300W
Plasma Lamp & Housing	None	None	None
Power Supplies (# - Model)	(1) LPS-350	(1) LPS-350	(1) LPS-350
Special Power Supply	Integrated Xenon	Integrated Xenon	Integrated Xenon
Variable Attenuator	(2) VAA-220A	(2) VAD-012	(2) VA-MM
Monitor Detector(s)	SD-S1	SD-S1	SD-S1
Detector Filters (in Filter Holder)	Photopic	Photopic	Photopic
System Software	HELIOsense	HELIOsense	HELIOsense
Spectral Radiance Monitor (Type, Spectral Range)	CDS-800	CDS-800	CDS-800
<b>STANDARD SYSTEM CALIBRATIONS (NIST Traceable)</b>			
Luminance	Yes	Yes	Yes
Correlated Color Temp (All lamps matched & w/VA position)	Yes	Yes	Yes
QTH Only Spectral Radiance (350-2400nm)	Yes	Yes	Yes
Xenon Only Spectral Radiance (350-2400nm)	Yes	Yes	Yes
QTH & Xenon Spectral Radiance (350-2400nm) & CDS	Yes	Yes	Yes
Exit Port Spatial Uniformity	Yes	Yes	Yes
Exit Port Angular Uniformity	Yes	Yes	Yes
Operational Duration of Calibration (Xe/QTH)	25 hrs / 50 hrs	25 hrs / 50 hrs	25 hrs / 50 hrs

# A Family: Air Mass (Albedo) Sunlight Source

Model Number Smart Part Number	USLR-A12F-XAN2-P A3XA-N2NN-NNAR-NS00-0000-P	USLR-A12L-XAN2-P A4XA-N2NN-NNAR-NS00-0000-P	USLR-A12L-UAN1-P A4UA-N1NN-NNAR-NS00-0000-P
<b>OPTICAL PERFORMANCE SPECIFICATIONS</b>			
<b>UNIFORMITY (EACH LAMP OR COMBINED)</b>			
Spatial Luminance Uniformity over Exit Port (f/4) - All Lamps On	+/-1.0%	+/-1.0%	+/-1.0%
Angular Uniform FOV (Full Angle) - Degrees / F# / NA - All Lamps On	+/-2.0% - 35° / 0.85 / 0.6	+/-2.0% - 35° / 0.85 / 0.6	+/-2.0% - 35° / 0.85 / 0.6
<b>QTH ONLY</b>			
Expected Luminance Output: cd/m <sup>2</sup>	11,500	15,500	15,500
Expected Illuminance at Port: lux	36,000	49,000	49,000
Est. Peak Radiance: W/m <sup>2</sup> -sr-um @ 0.95 um	350	460	460
Est. Peak Irradiance @ Port: Photons/s-m <sup>2</sup> -um @ 0.95um	1.50E+21	2.20E+21	2.20E+21
Minimum Resolution: lux	3.60E-03	3.60E-03	3.60E-03
Approximate Correlated Color Temperature (QTH)	3000K +/-50K	3000K +/-50K	3000K +/-50K
Typical Lamp Lifetimes (hrs)	>500hrs	>500hrs	>500hrs
Est. Lamp Degradation Over Lifetime (% & CCT Shift)	-10% & +/-200K	-10% & +/-200K	-10% & +/-200K
Est. Output Degradation over 50hrs (% & CCT Shift)	-1.0% & +/-20K	-1.0% & +/-20K	-1.0% & +/-20K
<b>PLASMA OR XENON ONLY</b>			
Expected Luminance Output: cd/m <sup>2</sup>	30,500	42,000	13,500
Expected Illuminance at Port: lux	96,000	132,000	42,000
Est. Peak Radiance: W/m <sup>2</sup> -sr-um @ 0.60um Pl @ 0.47 Xe	420	550	170
Est. Peak Irradiance @ Port: Photons/s-m <sup>2</sup> -um @ 0.60um Pl or 0.47 Xe	1.20E+20	1.60E+21	5.10E+20
Minimum Resolution: lux	9.60E-03	1.32E-02	4.20E-03
Approximate Correlated Color Temperature	6000K +200K/-400K	6000K +200K/-400K	6000 +/-300K
Plasma Rest Mode/Xenon Flicker (Peak-Peak/RMS/Hz) - Typical	4%/1%/5kHz	4%/1%/5kHz	4%/1%/5kHz
Plasma Test Mode (Peak-Peak/RMS/Hz) - 30 minutes (Rest 5min)	N/A	N/A	N/A
Installed Cold Mirror (330-750nm)	Yes	Yes	None
Typical Lamp Lifetimes (hrs) Plasma/Xenon	400	400	400
Est. Lamp Degradation Over Lifetime (% & CCT Shift)	-50% & -600K	-50% & -600K	-50% & -600K
Est. Output Degradation over 50hrs (% & CCT Shift)	-2.5% / -30K	-2.5% / -30K	-2.5% / -30K
<b>PLASMA/XENON &amp; QTH (Both Full Open VA)</b>			
Expected Luminance Output: cd/m <sup>2</sup>	37,500	47,300	32,500
Expected Illuminance at Port: lux	117,800	148,200	102,000
Est. Peak Radiance: W/m <sup>2</sup> -sr-um @ 0.60um Pl @ 0.47 Xe	600	770	620
Est. Peak Irradiance @ Port: Photons/s-m <sup>2</sup> -um @ 0.60um Pl @ 0.47 Xe	1.14E+21	1.52E+21	1.03E+21
Approximate Correlated Color Temperature (Xenon & QTH)	5100K +400K/-200K	5100K +400K/-200K	5400K +400K/-200K
<b>ATTENUATORS</b>			
Number of Steps in Attenuator Range	2.00E+06	2.00E+06	2.00E+06
Dynamic Range/Bits/dB - Full Range of System (both lamps)	2.68E+07/24/148	3.37E+07/25/150	2.32E+07/24/146
<b>INTEGRATING SPHERE</b>			
Coating / Material	Spectralect	Spectralon®	Spectralon
Sphere Internal Diameter: Inches (Meters)	12 (0.3)	11.5 (0.29)	11.5 (0.29)
Frame Type	12 in Cage	12 in Cage	12 in Cage
Output Port Size: Inches (Meters)	4 (0.1)	4 (0.1)	4 (0.1)
<b>SYSTEM COMPONENTS</b>			
QTH Lamps Internal (#, Wattage)	(0)	(0)	(0)
QTH Lamps External (#, Wattage)	(1) 150	(1) 150	(1) 150
Xenon Lamp & Housing	175W	175W	UV 175W
Plasma Lamp & Housing	None	None	None
Power Supplies (# - Model)	(1) LPS-350	(1) LPS-350	(1) LPS-350
Special Power Supply	Integrated Xenon	Integrated Xenon	Integrated Xenon
Variable Attenuator	(2) VAA-220A	(2) VAA-220A	(2) VAA-220A
Monitor Detector(s)	SD-S1	SD-S1	SD-S1
Detector Filters (in Filter Holder)	Photopic	Photopic	Photopic
System Software	HELIOsense	HELIOsense	HELIOsense
Spectral Radiance Monitor (Type, Spectral Range)	CDS-800	CDS-800	CDS-800
<b>STANDARD SYSTEM CALIBRATIONS (NIST Traceable)</b>			
Luminance	Yes	Yes	Yes
Correlated Color Temp (All lamps matched & w/VA position)	Yes	Yes	Yes
QTH Only Spectral Radiance (350-2400nm)	Yes	Yes	Yes
Xenon Only Spectral Radiance (350-2400nm)	Yes	Yes	Yes
QTH & Xenon Spectral Radiance (350-2400nm) & CDS	Yes	Yes	Yes
Exit Port Spatial Uniformity	Yes	Yes	Yes
Exit Port Angular Uniformity	Yes	Yes	Yes
Operational Duration of Calibration (Xe/QTH)	25 hrs / 50 hrs	25 hrs / 50 hrs	25 hrs / 50 hrs

# A Family: Air Mass (Albedo) Sunlight Source

Model Number Smart Part Number	USLR-A12F-XDN2-P A3XD-N2NN-NNAR-NS00-0000-P	USLR-A12L-XDN2-P A4XD-N2NN-NNAR-NS00-0000-P	USLR-A12L-UDN1-P A4UD-N1NN-NNAR-NS00-0000-P
<b>OPTICAL PERFORMANCE SPECIFICATIONS</b>			
<b>UNIFORMITY (EACH LAMP OR COMBINED)</b>			
Spatial Luminance Uniformity over Exit Port (f/4) - All Lamps On	+/-1.0%	+/-1.0%	+/-1.0%
Angular Uniform FOV (Full Angle) - Degrees / F# / NA - All Lamps On	+/-2.0% - 35° / 0.85 / 0.6	+/-2.0% - 35° / 0.85 / 0.6	+/-2.0% - 35° / 0.85 / 0.6
<b>QTH ONLY</b>			
Expected Luminance Output: cd/m <sup>2</sup>	11,500	15,500	15,500
Expected Illuminance at Port: lux	36,000	49,000	49,000
Est. Peak Radiance: W/m <sup>2</sup> -sr-um @ 0.95 um	350	460	460
Est. Peak Irradiance @ Port: Photons/s-m <sup>2</sup> -um @ 0.95um	1.50E+21	2.20E+21	2.20E+21
Minimum Resolution: lux	3.27E+00	3.27E+00	3.27E+00
Approximate Correlated Color Temperature (QTH)	3000K +/-50K	3000K +/-50K	3000K +/-50K
Typical Lamp Lifetimes (hrs)	>500hrs	>500hrs	>500hrs
Est. Lamp Degradation Over Lifetime (% & CCT Shift)	-10% & +/-200K	-10% & +/-200K	-10% & +/-200K
Est. Output Degradation over 50hrs (% & CCT Shift)	-1.0% & +/-20K	-1.0% & +/-20K	-1.0% & +/-20K
<b>PLASMA OR XENON ONLY</b>			
Expected Luminance Output: cd/m <sup>2</sup>	30,500	42,000	16,500
Expected Illuminance at Port: lux	48,000	132,000	51,800
Est. Peak Radiance: W/m <sup>2</sup> -sr-um @ 0.60um Pl @ 0.47 Xe	420	550	430
Est. Peak Irradiance @ Port: Photons/s-m <sup>2</sup> -um @ 0.60um Pl or 0.47 Xe	1.20E+21	1.60E+21	7.16E+20
Minimum Resolution: lux	4.36E+00	1.20E+01	4.71E+00
Approximate Correlated Color Temperature	6000K +200K/-400K	6000K +200K/-400K	6000 +/-300K
Plasma Rest Mode/Xenon Flicker (Peak-Peak/RMS/Hz) - Typical	4%/1%/5kHz	4%/1%/5kHz	4%/1%/5kHz
Plasma Test Mode (Peak-Peak/RMS/Hz) - 30 minutes (Rest 5min)	N/A	N/A	N/A
Installed Cold Mirror (330-750nm)	Yes	Yes	None
Typical Lamp Lifetimes (hrs) Plasma/Xenon	400	400	400
Est. Lamp Degradation Over Lifetime (% & CCT Shift)	-50% & -600K	-50% & -600K	-50% & -600K
Est. Output Degradation over 50hrs (% & CCT Shift)	-2.5% / -30K	-2.5% / -30K	-2.5% / -30K
<b>PLASMA/XENON &amp; QTH (Both Full Open VA)</b>			
Expected Luminance Output: cd/m <sup>2</sup>	42,000	58,000	32,000
Expected Illuminance at Port: lux	84,000	182,000	100,800
Est. Peak Radiance: W/m <sup>2</sup> -sr-um @ 0.60um Pl @ 0.47 Xe	600	820	620
Est. Peak Irradiance @ Port: Photons/s-m <sup>2</sup> -um @ 0.60um Pl @ 0.47 Xe	1.43E+21	2.50E+21	1.03E+21
Approximate Correlated Color Temperature (Xenon & QTH)	5100K +400K/-200K	5100K +400K/-200K	5400K +400K/-200K
<b>ATTENUATORS</b>			
Number of Steps in Attenuator Range	1.20E+04	1.20E+04	1.20E+04
Dynamic Range/Bits/dB - Full Range of System (both lamps)	2.95E+04/14/89	3.71E+04/15/91	2.55E+04/14/88
<b>INTEGRATING SPHERE</b>			
Coating / Material	Spectrafect	Spectralon	Spectralon
Sphere Internal Diameter: Inches (Meters)	12 (0.3)	11.5 (0.29)	11.5 (0.29)
Frame Type	12 in Cage	12 in Cage	12 in Cage
Output Port Size: Inches (Meters)	4 (0.1)	4 (0.1)	4 (0.1)
<b>SYSTEM COMPONENTS</b>			
QTH Lamps Internal (# , Wattage)	(0)	(0)	(0)
QTH Lamps External (#, Wattage)	(1) 150	(1) 150	(1) 150
Xenon Lamp & Housing	175W	UV 175W	UV 175W
Plasma Lamp & Housing	None	None	None
Power Supplies (# - Model)	(1) LPS-350	(1) LPS-350	(1) LPS-350
Special Power Supply	Integrated Xenon	Integrated Xenon	Integrated Xenon
Variable Attenuator	(2) VAD-012	(2) VAD-012	(2) VAD-012
Monitor Detector(s)	SD-S1	SD-S1	SD-S1
Detector Filters (in Filter Holder)	Photopic	Photopic	Photopic
System Software	HELIOsense	HELIOsense	HELIOsense
Spectral Radiance Monitor (Type, Spectral Range)	CDS-800	CDS-800	CDS-800
<b>STANDARD SYSTEM CALIBRATIONS (NIST Traceable)</b>			
Luminance	Yes	Yes	Yes
Correlated Color Temp (All lamps matched & w/VA position)	Yes	Yes	Yes
QTH Only Spectral Radiance (350-2400nm)	Yes	Yes	Yes
Xenon Only Spectral Radiance (350-2400nm)	Yes	Yes	Yes
QTH & Xenon Spectral Radiance (350-2400nm) & CDS	Yes	Yes	Yes
Exit Port Spatial Uniformity	Yes	Yes	Yes
Exit Port Angular Uniformity	Yes	Yes	Yes
Operational Duration of Calibration (Xe/QTH)	25 hrs / 50 hrs	25 hrs / 50 hrs	25 hrs / 50 hrs

# A Family: Air Mass (Albedo) Sunlight Source

Model Number Smart Part Number	USLR-A12F-XMN2-P A3XM-N2NN-NNAR-NS00-0000-P	USLR-A12L-XMN2-P A4XM-N2NN-NNAR-NS00-0000-P	USLR-A12L-UMN1-P A4UM-N1NN-NNAR-NS00-0000-P
<b>OPTICAL PERFORMANCE SPECIFICATIONS</b>			
<b>UNIFORMITY (EACH LAMP OR COMBINED)</b>			
Spatial Luminance Uniformity over Exit Port (f/4) - All Lamps On	+/-1.0%	+/-1.0%	+/-1.0%
Angular Uniform FOV (Full Angle) - Degrees / F# / NA - All Lamps On	+/-2.0% - 35° / 0.85 / 0.6	+/-2.0% - 35° / 0.85 / 0.6	+/-2.0% - 35° / 0.85 / 0.6
<b>QTH ONLY</b>			
Expected Luminance Output: cd/m <sup>2</sup>	11,500	15,500	15,500
Expected Illuminance at Port: lux	36,000	49,000	49,000
Est. Peak Radiance: W/m <sup>2</sup> -sr-um @ 0.95 um	350	460	460
Est. Peak Irradiance @ Port: Photons/s-m <sup>2</sup> -um @ 0.95um	1.50E+21	2.20E+21	2.20E+21
Minimum Resolution: lux	7.20E-01	9.80E+01	9.80E+01
Approximate Correlated Color Temperature (QTH)	3000K +/-50K	3000K +/-50K	3000K +/-50K
Typical Lamp Lifetimes (hrs)	>500hrs	>500hrs	>500hrs
Est. Lamp Degradation Over Lifetime (% & CCT Shift)	-10% & +/-200K	-10% & +/-200K	-10% & +/-200K
Est. Output Degradation over 50hrs (% & CCT Shift)	-1.0% & +/-20K	-1.0% & +/-20K	-1.0% & +/-20K
<b>PLASMA OR XENON ONLY</b>			
Expected Luminance Output: cd/m <sup>2</sup>	30,500	42,000	16,500
Expected Illuminance at Port: lux	42,000	132,000	51,800
Est. Peak Radiance: W/m <sup>2</sup> -sr-um @ 0.60um Pl @ 0.47 Xe	420	550	430
Est. Peak Irradiance @ Port: Photons/s-m <sup>2</sup> -um @ 0.60um Pl or 0.47 Xe	1.20E+21	1.60E+21	7.16E+20
Minimum Resolution: lux	8.40E+01	2.64E+00	1.04E+00
Approximate Correlated Color Temperature	6000K +200K/-400K	6000K +200K/-400K	6000 +/-300K
Plasma Rest Mode/Xenon Flicker (Peak-Peak/RMS/Hz) - Typical	4%/1%/5kHz	4%/1%/5kHz	4%/1%/5kHz
Plasma Test Mode (Peak-Peak/RMS/Hz) - 30 minutes (Rest 5min)	N/A	N/A	N/A
Installed Cold Mirror (330-750nm)	Yes	Yes	None
Typical Lamp Lifetimes (hrs) Plasma/Xenon	400	400	400
Est. Lamp Degradation Over Lifetime (% & CCT Shift)	-50% & -600K	-50% & -600K	-50% & -600K
Est. Output Degradation over 50hrs (% & CCT Shift)	-2.5% / -30K	-2.5% / -30K	-2.5% / -30K
<b>PLASMA/XENON &amp; QTH (Both Full Open VA)</b>			
Expected Luminance Output: cd/m <sup>2</sup>	42,000	58,000	32,000
Expected Illuminance at Port: lux	78,000	182,000	100,800
Est. Peak Radiance: W/m <sup>2</sup> -sr-um @ 0.60um Pl @ 0.47 Xe	600	820	620
Est. Peak Irradiance @ Port: Photons/s-m <sup>2</sup> -um @ 0.60um Pl @ 0.47 Xe	1.43E+21	2.50E+21	1.03E+21
Approximate Correlated Color Temperature (Xenon & QTH)	5100K +400K/-200K	5100K +400K/-200K	5400K +400K/-200K
<b>ATTENUATORS</b>			
Number of Steps in Attenuator Range	1.00E+04	1.00E+04	1.00E+04
Dynamic Range/Bits/dB - Full Range of System (both lamps)	1.34E+05/17/102	1.48E+05/17/102	1.02E+05/16/99
<b>INTEGRATING SPHERE</b>			
Coating / Material	Spectralect	Spectralon	Spectralon
Sphere Internal Diameter: Inches (Meters)	12 (0.3)	11.5 (0.29)	11.5 (0.29)
Frame Type	12 in Cage	12 in Cage	12 in Cage
Output Port Size: Inches (Meters)	4 (0.1)	4 (0.1)	4 (0.1)
<b>SYSTEM COMPONENTS</b>			
QTH Lamps Internal (#, Wattage)	(0)	(0)	(0)
QTH Lamps External (#, Wattage)	(1) 150	(1) 150	(1) 150
Xenon Lamp & Housing	175W	175W	UV 175W
Plasma Lamp & Housing	None	None	None
Power Supplies (# - Model)	(1) LPS-350	(1) LPS-350	(1) LPS-350
Special Power Supply	Integrated Xenon	Integrated Xenon	Integrated Xenon
Variable Attenuator	(2) VA-MM	(2) VA-MM	(2) VA-MM
Monitor Detector(s)	SD-S1	SD-S1	SD-S1
Detector Filters (in Filter Holder)	Photopic	Photopic	Photopic
System Software	HELIOsense	HELIOsense	HELIOsense
Spectral Radiance Monitor (Type, Spectral Range)	CDS-800	CDS-800	CDS-800
<b>STANDARD SYSTEM CALIBRATIONS (NIST Traceable)</b>			
Luminance	Yes	Yes	Yes
Correlated Color Temp (All lamps matched & w/VA position)	Yes	Yes	Yes
QTH Only Spectral Radiance (350-2400nm)	Yes	Yes	Yes
Xenon Only Spectral Radiance (350-2400nm)	Yes	Yes	Yes
QTH & Xenon Spectral Radiance (350-2400nm) & CDS	Yes	Yes	Yes
Exit Port Spatial Uniformity	Yes	Yes	Yes
Exit Port Angular Uniformity	Yes	Yes	Yes
Operational Duration of Calibration (Xe/QTH)	25 hrs / 50 hrs	25 hrs / 50 hrs	25 hrs / 50 hrs