D Family: Dynamic Range

Model Number	USLR-D20F-NANS	USLR-D20F-NDNN	USLR-D20F-NMNN	USLR-D12F-NANS
Smart Part Number	D5NA-NSNN-N1SR-NS00-0000	D5ND-NNNN-NNSR-NS00-0000	D5NM-NNNN-N1SR-NS00-0000	D3NA-NSNN-N1SR-NS00-0000
OPTICAL PERFORMANCE SPECIFICATIONS				
Spatial Luminance Uniformity over Exit Port (f/4) - All Lamps On	+/-1.0%	+/-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	+/-2.0% - 35° / 0.85 / 0.6
Expected Luminance Output: cd/m2	24,000	24,000	24,000	40,000
Expected Illuminance at Port: lux	78,000	78,000	78,000	135,000
Est. Peak Radiance: W/m2-sr-um @ 0.95 um	680	680	680	1,200
Est. Peak Irradiance @ Port: Photons/s-m2-um @ 0.95um	3.20E+00	3.20E+00	3.20E+00	5.80E+21
Minimum Resolution: lux	4.33E-03	1.20E+00	2.64E-01	7.50E-03
Number of Steps in System Range (#lamps*VA Steps)	8.80E+06	4.80E+04	4.00E+04	6.60E+06
Dynamic Range/Bits/dB	6.66e+07/25/154	7.33E+04/16/99	3.33E+05/18/109	8.63E+07/26/158
Approximate Correlated Color Temperature (QTH)	3000K +/-50K	3000K +/-50K	3000K +/-50K	3000K +/-50K
Typical Lamp Lifetimes (hrs)	>500	>500	>500	>500
Est. Lamp Degradation Over Lifetime (% & CCT Shift)	-10% & +/-200K	-10% & +/-200K	-10% & +/-200K	-10% & +/-200K
Est. Output Degradation over 50hrs (% & CCT Shift)	-1.0% & +/-20K	-1.0% & +/-20K	-1.0% & +/-20K	-1.0% & +/-20K
INTEGRATING SPHERE				
Coating / Material	Spectraflect®	Spectraflect	Spectraflect	Spectraflect
Sphere Internal Diameter: Inches (Meters)	20 (0.5)	20 (0.5)	20 (0.5)	12 (0.3)
Frame Type	20 in Cage	20 in Cage	20 in Cage	12 in Cage
Output Port Size: Inches (Meters)	8 (0.2)	8 (0.2)	8 (0.2)	4 (0.1)
SYSTEM COMPONENTS				
QTH Lamps Internal (# , Wattage)	(1) 35, (1) 75, (1) 150	(1) 35, (1) 75, (1) 150	(1) 35, (1) 75, (1) 150	(1) 35, (1) 75
QTH Lamps External (#, Wattage)	(1) 150	(1) 150	(1) 150	(1) 150
Power Supplies (# - Wattages)	(4) LPS-400	(4) LPS-400	(4) LPS-400	(3) LPS-400
Variable Attenuator	VAA-220A	VAD-012	VA-MM	VAA-220A
Monitor Detector	SD-S1	SD-S1	SD-S1	SD-S1
Detector Filters (in Filter Holder)	Photopic	Photopic	Photopic	Photopic
System Software	HELIOSense	HELIOSense	HELIOSense	HELIOSense
Cube Computer	Included	Included	Included	Included
STANDARD SYSTEM CALIBRATIONS (NIST Traceable)				
Luminance	Yes	Yes	Yes	Yes
Correlated Color Temp (All lamps matched & w/VA position)	Yes	Yes	Yes	Yes
Spectral Radiance (350-2400nm)	Yes	Yes	Yes	Yes
Exit Port Spatial Uniformity	Yes	Yes	Yes	Yes
Exit Port Angular Uniformity	Yes	Yes	Yes	Yes
Operational Duration of Calibration	50 hrs	50 hrs	50 hrs	50 hrs

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D Family: Dynamic Range

Model Number Smart Part Number	USRL-D12L-NANS D4NA-NSPN-N1SR-NS00-0000	USLR-D12F-NDNN D3ND-NNNN-NNSR-NS00-0000	USLR-D12L-NDNN D4ND-NNNN-NNSR-NS00-0000	USLR-D12F-NMNN D3NM-NNNN-NNSR-NS00-0000
OPTICAL PERFORMANCE SPECIFICATIONS				
Spatial Luminance Uniformity over Exit Port (f/4) - All Lamps On	+/-1.0%	+/-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	+/-2.0% - 35° / 0.85 / 0.6
Expected Luminance Output: cd/m2	59,000	40,000	59,000	40,000
Expected Illuminance at Port: lux	190,000	135,000	190,000	135,000
Est. Peak Radiance: W/m2-sr-um @ 0.95 um	1,900	1,200	1,900	1,200
Est. Peak Irradiance @ Port: Photons/s-m2-um @ 0.95um	9.10E+21	5.80E+21	9.10E+21	5.80E+21
Minimum Resolution: lux	1.06E-02	1.24E+00	1.24E+00	2.73E-01
Number of Steps in System Range (#lamps*VA Steps)	6.60E+06	3.60E+04	3.60E+04	3.00E+04
Dynamic Range/Bits/dB	1.15E+08/26/160	9.49E+04/16/93	1.27E+05/16/101	4.31E+05/17/111
Approximate Correlated Color Temperature (QTH)	3000K +/-50K	3000K +/-50K	3000K +/-50K	3000K +/-50K
Typical Lamp Lifetimes (hrs)	>500	>500	>500	>500
Est. Lamp Degradation Over Lifetime (% & CCT Shift)	-10% & +/-200K	-10% & +/-200K	-10% & +/-200K	-10% & +/-200K
Est. Output Degradation over 50hrs (% & CCT Shift)	-1.0% & +/-20K	-1.0% & +/-20K	-1.0% & +/-20K	-1.0% & +/-20K
INTEGRATING SPHERE				
Coating / Material	Spectralon	Spectraflect	Spectralon	Spectraflect
Sphere Internal Diameter: Inches (Meters)	11.5 (0.29)	12 (0.3)	11.5 (0.29)	12 (0.3)
Frame Type	12 in Cage	12 in Cage	12 in Cage	12 in Cage
Output Port Size: Inches (Meters)	4 (0.1)	4 (0.1)	4 (0.1)	4 (0.1)
SYSTEM COMPONENTS				
QTH Lamps Internal (# , Wattage)	(1) 35, (1) 75	(1) 35, (1) 75	(1) 35, (1) 75	(1) 35, (1) 75
QTH Lamps External (#, Wattage)	(1) 150	(1) 150	(1) 150	(1) 150
Power Supplies (# - Wattages)	(3) LPS-400	(3) LPS-400	(3) LPS-400	(3) LPS-400
Variable Attenuator	VAA-220A	VAD-012	VAD-012	VA-MM
Monitor Detector	SD-S1	SD-S1	SD-S1	SD-S1
Detector Filters (in Filter Holder)	Photopic	Photopic	Photopic	Photopic
System Software	HELIOSense	HELIOSense	HELIOSense	HELIOSense
Cube Computer	Included	Included	Included	Included
STANDARD SYSTEM CALIBRATIONS (NIST Traceable)				
Luminance	Yes	Yes	Yes	Yes
Correlated Color Temp (All lamps matched & w/VA position)	Yes	Yes	Yes	Yes
Spectral Radiance (350-2400nm)	Yes	Yes	Yes	Yes
Exit Port Spatial Uniformity	Yes	Yes	Yes	Yes
Exit Port Angular Uniformity	Yes	Yes	Yes	Yes
Operational Duration of Calibration	50 hrs	50 hrs	50 hrs	50 hrs

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D Family: Dynamic Range

Model Number Smart Part Number	USLR-D12L-NMNN D4NM-NNNN-NNSR-NS00-0000	USLR-D08F-NANS D1NA-NSNN-N1SR-NS00-0000	USLR-D08L-NANS D2NA-NSNN-N1SR-NS00-0000	USLR-D08F-NDNN D1ND-NNNN-NNSR-NS00-0000
OPTICAL PERFORMANCE SPECIFICATIONS				
Spatial Luminance Uniformity over Exit Port (f/4) - All Lamps On	+/-1.0%	+/-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	+/-2.0% - 35° / 0.85 / 0.6
Expected Luminance Output: cd/m2	59,000	55,000	85,000	55,000
Expected Illuminance at Port: lux	190,000	185,000	275,000	185,000
Est. Peak Radiance: W/m2-sr-um @ 0.95 um	1,900	1,600	2,700	1,600
Est. Peak Irradiance @ Port: Photons/s-m2-um @ 0.95um	9.10E+21	7.40E+21	1.30E+22	7.40E+21
Minimum Resolution: lux	2.73E-01	1.03E-02	1.53E-02	8.41E+00
Number of Steps in System Range (#lamps*VA Steps)	3.00E+04	2.00E+06	2.00E+06	2.40E+04
Dynamic Range/Bits/dB	5.75E+05/18/114	2.00E+07/24/145	2.00E+07/24/145	2.20E+04/14/86
Approximate Correlated Color Temperature (QTH)	3000K +/-50K	3000K +/-50K	3000K +/-50K	3000K +/-50K
Typical Lamp Lifetimes (hrs)	>500	>500	>500	>500
Est. Lamp Degradation Over Lifetime (% & CCT Shift)	-10% & +/-200K	-10% & +/-200K	-10% & +/-200K	-10% & +/-200K
Est. Output Degradation over 50hrs (% & CCT Shift)	-1.0% & +/-20K	-1.0% & +/-20K	-1.0% & +/-20K	-1.0% & +/-20K
INTEGRATING SPHERE				
Coating / Material	Spectralon®	Spectraflect	Spectralon	Spectraflect
Sphere Internal Diameter: Inches (Meters)	11.5 (0.29)	8 (0.2)	7.5 (0.19)	8 (0.2)
Frame Type	12 in Cage	8 in Cage	8 in Cage	8 in Cage
Output Port Size: Inches (Meters)	4 (0.1)	2 (0.05)	2 (0.05)	2 (0.05)
SYSTEM COMPONENTS				
QTH Lamps Internal (# , Wattage)	(1) 35, (1) 75	(1) 35	(1) 35	(1) 35
QTH Lamps External (#, Wattage)	(1) 150	(1) 150	(1) 150	(1) 150
Power Supplies (# - Wattages)	(3) LPS-400	(2) LPS-400	(2) LPS-400	(2) LPS-400
Variable Attenuator	VA-MM	VAA-220A	VAA-220A	VAD-012
Monitor Detector	SD-S1	SD-S1	SD-S1	SD-S1
Detector Filters (in Filter Holder)	Photopic	Photopic	Photopic	Photopic
System Software	HELIOSense	HELIOSense	HELIOSense	HELIOSense
Cube Computer	Included	Included	Included	Included
STANDARD SYSTEM CALIBRATIONS (NIST Traceable)				
Luminance	Yes	Yes	Yes	Yes
Correlated Color Temp (All lamps matched & w/VA position)	Yes	Yes	Yes	Yes
Spectral Radiance (350-2400nm)	Yes	Yes	Yes	Yes
Exit Port Spatial Uniformity	Yes	Yes	Yes	Yes
Exit Port Angular Uniformity	Yes	Yes	Yes	Yes
Operational Duration of Calibration	50 hrs	50 hrs	50 hrs	50 hrs

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D Family: Dynamic Range

Model Number	USLR-D08L-NDNN	USLR-D08F-NMNN	USLR-D08L-NMNN
Smart Part Number	D2ND-NNNN-NNSR-NS00-0000	D1NM-NNNN-NNSR-NS00-0000	D2NM-NNNN-NNSR-NS00-0000
OPTICAL PERFORMANCE SPECIFICATIONS			
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
Expected Luminance Output: cd/m2	85,000	55,000	85,000
Expected Illuminance at Port: lux	275,000	185,000	275,000
Est. Peak Radiance: W/m2-sr-um @ 0.95 um	2,700	1,600	2,700
Est. Peak Irradiance @ Port: Photons/s-m2-um @ 0.95um	1.30E+22	7.40E+21	1.30E+22
Minimum Resolution: lux	1.25E+01	1.85E+00	2.75E+00
Number of Steps in System Range (#lamps*VA Steps)	2.40E+04	2.00E+04	2.00E+04
Dynamic Range/Bits/dB	2.40E+04/14/87	1.00E+05/16/99	1.00E+05/16/99
Approximate Correlated Color Temperature (QTH)	3000K +/-50K	3000K +/-50K	3000K +/-50K
Typical Lamp Lifetimes (hrs)	>500	>500	>500
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
INTEGRATING SPHERE			
Coating / Material	Spectralon	Spectraflect	Spectralon
Sphere Internal Diameter: Inches (Meters)	7.5 (0.19)	8 (0.2)	7.5 (0.19)
Frame Type	8 in Cage	8 in Cage	8 in Cage
Output Port Size: Inches (Meters)	2 (0.05)	2 (0.05)	2 (0.05)
SYSTEM COMPONENTS			
QTH Lamps Internal (# , Wattage)	(1) 35	(1) 35	(1) 35
QTH Lamps External (#, Wattage)	(1) 150	(1) 150	(1) 150
Power Supplies (# - Wattages)	(2) LPS-400	(2) LPS-400	(2) LPS-400
Variable Attenuator	VAD-012	VA-MM	VA-MM
Monitor Detector	SD-S1	SD-S1	SD-S1
Detector Filters (in Filter Holder)	Photopic	Photopic	Photopic
System Software	HELIOSense	HELIOSense	HELIOSense
Cube Computer	Included	Included	Included
STANDARD SYSTEM CALIBRATIONS (NIST Traceable)			
Luminance	Yes	Yes	Yes
Correlated Color Temp (All lamps matched & w/VA position)	Yes	Yes	Yes
Spectral Radiance (350-2400nm)	Yes	Yes	Yes
Exit Port Spatial Uniformity	Yes	Yes	Yes
Exit Port Angular Uniformity	Yes	Yes	Yes
Operational Duration of Calibration	50 hrs	50 hrs	50 hrs

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