



LumiBright™ 3300B

UV-LED Illuminators for DLP® Technology



LumiBright 3300B UV-LED Illuminators are an extremely high power, highly uniform UV-LED solution providing unprecedented speed and resolution for UV DLP applications such as 3D printing, computer-to-screen and computer-to-plate printing and maskless lithography. The patented UV-LED Illuminators comprise a densely packed UV-LED array coupled to a high efficiency non-imaging collection optic integrated with a telecentric imaging optic optimized to the DLP chipset.

Two models have been developed for DLP chipsets. The 20 Watt illuminator is designed for the DLP7000 chipset and the 30 Watt illuminator design supports the DLP9500 chipset. Water-cooling allows the UV-LED array to be operated at a very high current density. Available wavelengths for the UV-LED array include 365, 385, 395 and 405 nm in single or multi-wavelength configurations.

Benefits:

- Models for DLP9500 and DLP7000 chipsets
- High radiant power
 - > 30 Watts on DLP9500
 - > 20 Watts on DLP7000
- Long-life

ULTRAVIOLET:

- λ_p 365 nm thru 405

Features:

- UV-LED Array (COB)
- Non-imaging and imaging optics
- Thermistor temperature monitor
- Photosensor
- High thermal conductivity metal core PCB
- Water heat exchanger
- Quick disconnect no-spill couplings
- Driver/Controller
- Cables

Options:

- Single or or multi-wavelength configurations
- Inline or right-angle hose connections

Typical Applications:

- Computer-to-screen printing
- Computer-to-plate printing
- Maskless lithography
- 3-D printing
- Tissue engineering
- Digital phototherapy
- Corneal collagen cross-linking

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SPECIFICATIONS

Parameter	Specification	Comment
DLP acceptance half angle	12°	Matches DLP ± 12° micromirror tilt angle
DLP illumination overfill	≥ 10 %	Both height and width of DLP active array
Illumination non-uniformity	≤ 10 %	Peak-to-peak (P-P)
Drive current per channel/LED	Min 0.30 Amps Max 3.0 Amps	Continuous operation
Forward voltage	< 5V	• Requires constant current operation • V_f varies with drive current
Total drive power	300 Watts	Typical maximum
Electrical connectors	2 rows, 10 pin	(2) for LED board drive and control
	1 row, 4 pin	(1) for photosensor
Mounting flange	(4) through holes on 68mm diameter	10mm depth for M4 bolts
	Kinematic hole/slot	Locks position/rotation
Cooler fittings	Quick disconnect no-spill couplings	Right angle or Inline
Water supply	Use inline filter on inlet	Must be 20 μm rating
Thermistor $B_{25/85}$	3574 to 3646	For 10 kΩ
Thermistor impedance	10 kΩ	At 25° C
Operating temperature	15° C to 35° C	5% to 85% RH, non-condensing
Lifetime (hours)	> 3k hours	To 70% of initial radiant flux

WATER HEAT EXCHANGER PERFORMANCE CHART

Notes on Liquid Cooling

The cold plate of the water heat exchanger on the Model 3300B contains microchannels as small as 0.1 mm in size. The inlet water supply must use an inline filter with a 30 micron rating to avoid creating obstructions within the microchannels. The minimum flow rate must be 1.5 liters/min. An ideal water flow rate is 3 liters/min. A recirculating chiller with an inlet water temperature maintained at or below 25°C is recommended.

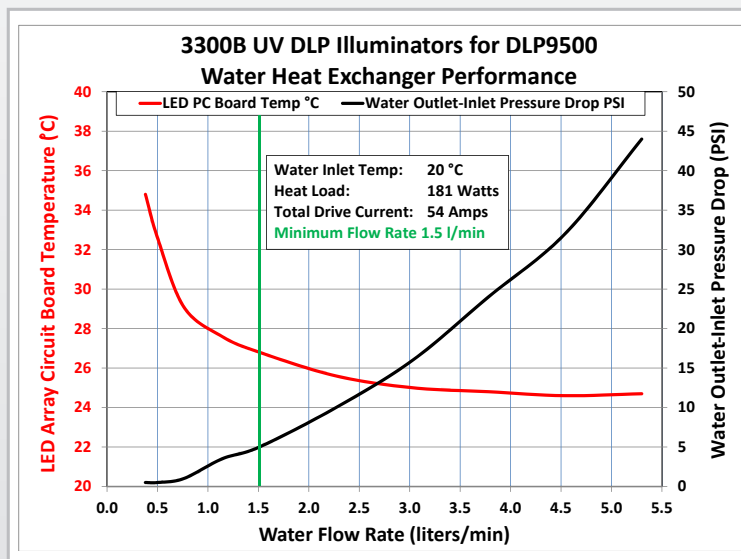


Figure 1

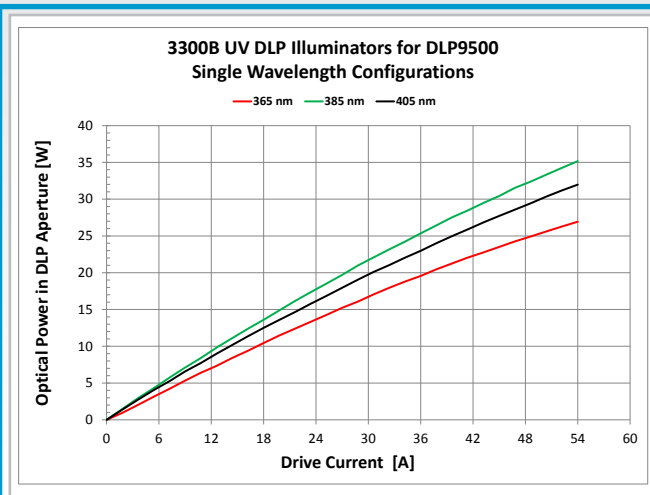


Figure 2

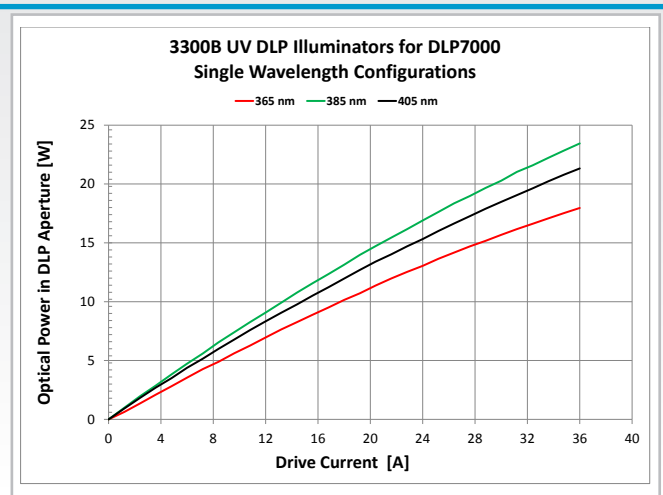


Figure 3

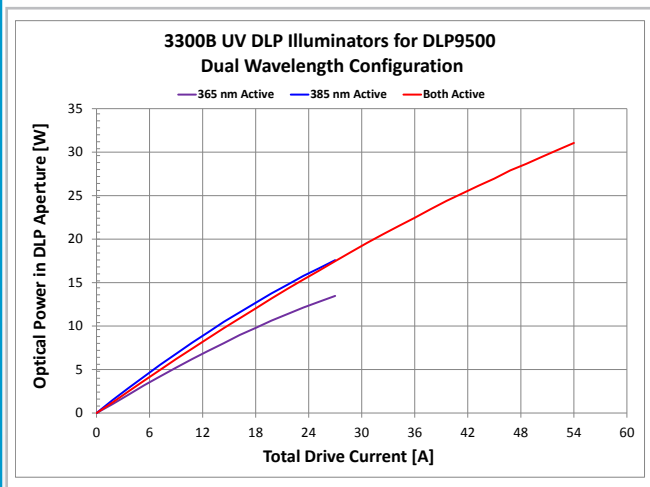


Figure 4

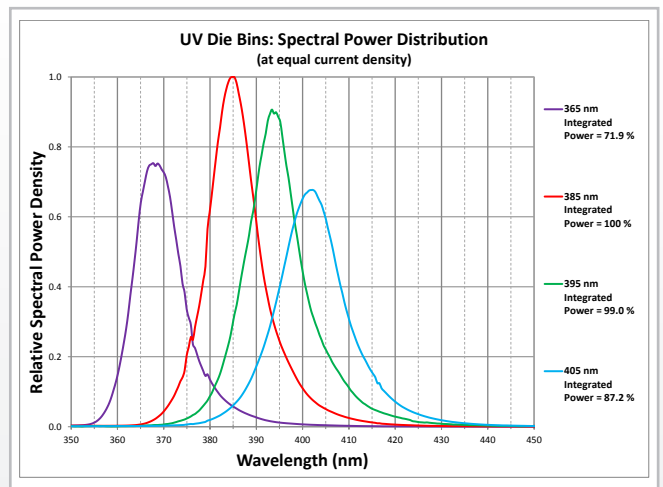


Figure 5

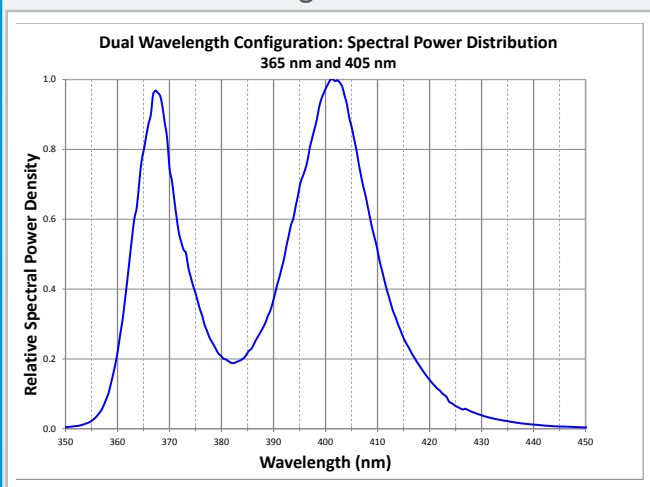


Figure 6

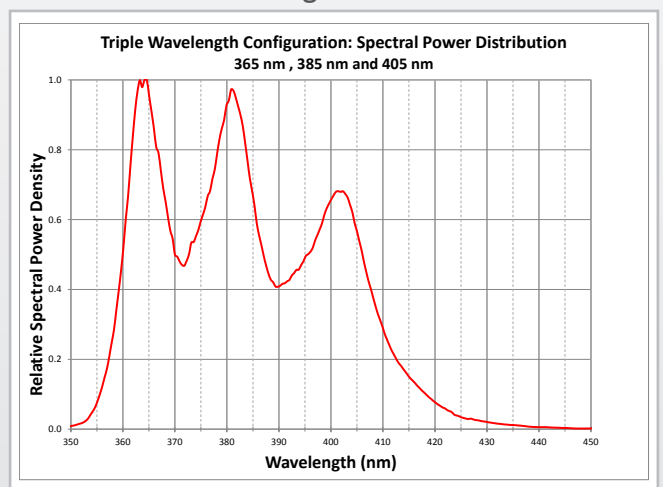


Figure 7

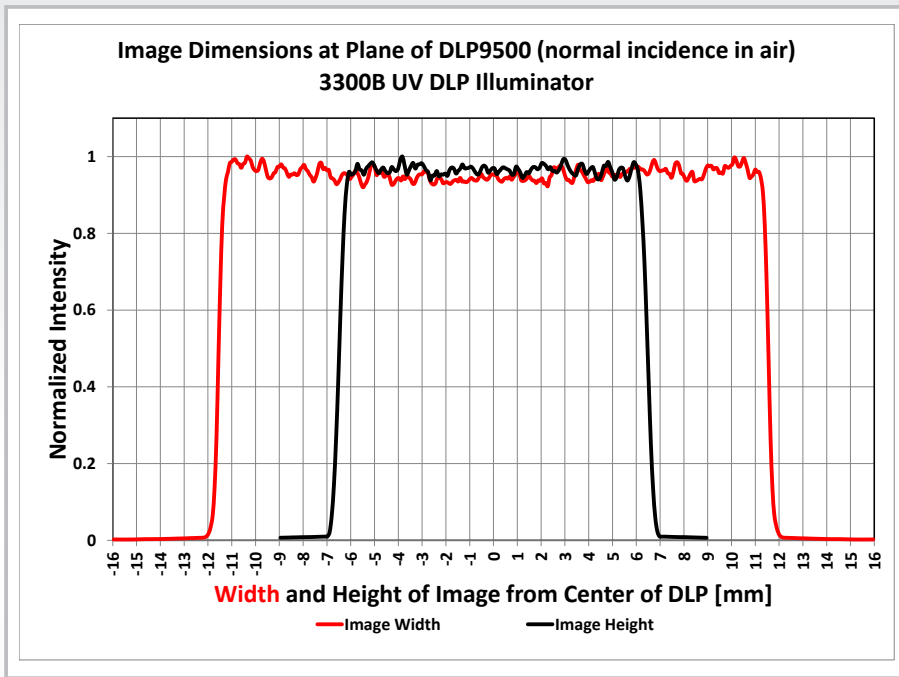


Figure 8

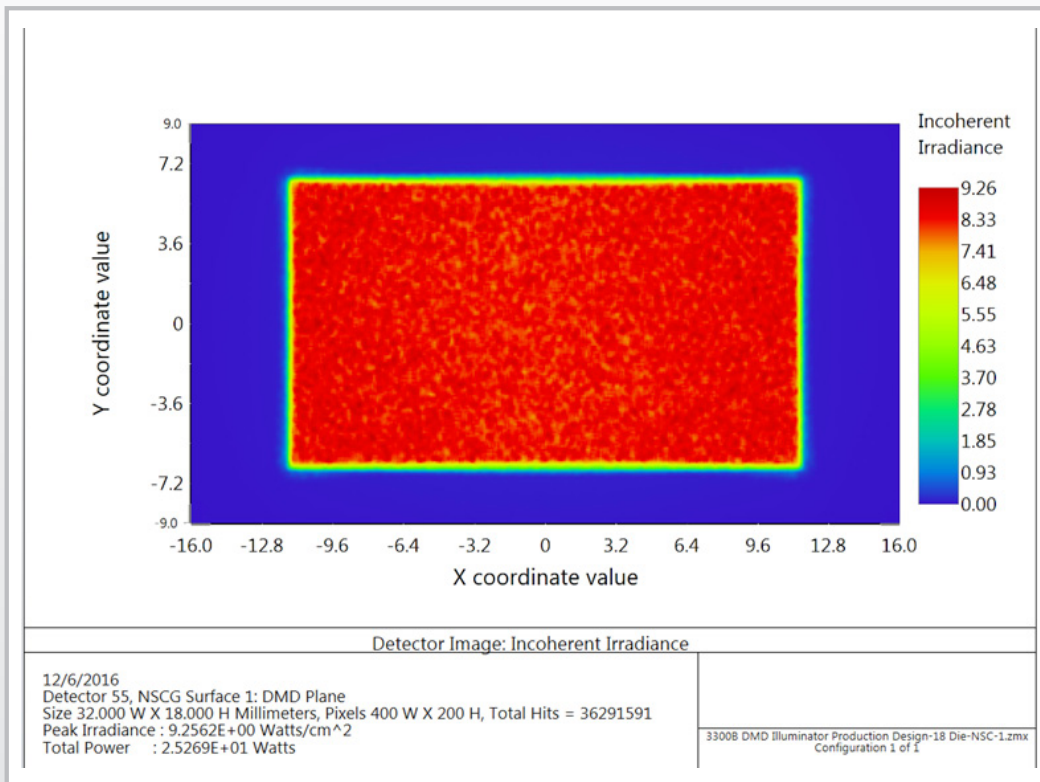


Figure 9

CONFIGURATIONS

BASELINE CONFIGURATIONS:

Model Number	DLP Chipset	LED Array Die Count	Cooler Type
3300B-620	DLP9500	18	Right Angle
3300B-621	DLP9500	18	Inline
3300B-650	DLP7000	12	Right Angle
3300B-651	DLP7000	12	Inline

DRIVER/CONTROLLER

Multi-Channel:



The IOI Model 5500A is a multi-channel OEM Driver/Controller with Ethernet and USB. The driver provides independent current control to each of the LED die to achieve optimal performance and lifetime.

Up to 18-die in the UV-LED array can be driven and modulated independently for precise exposure control in direct imaging systems. A command set is provided for user programming.

The 5500A has been specially designed to ensure maximum output and lifetime from Innovations in Optics' LumiBright 3300B UV-LED Illuminators by ensuring uniform current density through the entire LED array.

OPTIONS: (Please contact IOI to specify a final configuration and for pricing)

Wavelengths:

Four different center wavelengths are available with nominal spectral power distributions as plotted in Figure 5. The center wavelengths are within 5 nm of the following: 365 nm, 385 nm, 395 nm, 405 nm. Single or multiple wavelength configurations can be arranged.

Hose Connections:

The standard configuration uses hose connections aligned at a right-angle to the illuminator body as shown in the Interface Control Drawings. An optional configuration features hose connections that are in line with the illuminator body.

*** Failure to use the 5500A Driver/Controller or an inline water filter would void our warranty.**

NOTES**KINEMATIC MOUNTING FLANGE DESIGN**

All 3300B illuminators provide a kinematic type interface for accurate positional and angular registration to the DLP chipset. The mounting flange features a flat surface, a hole and a slot. The flange must mate to a flat surface on the DLP chipset housing which also must include two pins for the hole and slot. This ensures that the illuminator and housing always mate correctly. The pin-to-hole locks position and the pin-to-slot locks rotation.

In addition, when using the mounting flange, illumination overfill of the DLP active area designed into the telecentric optics relaxes positional and transverse tolerances along the optical axis.

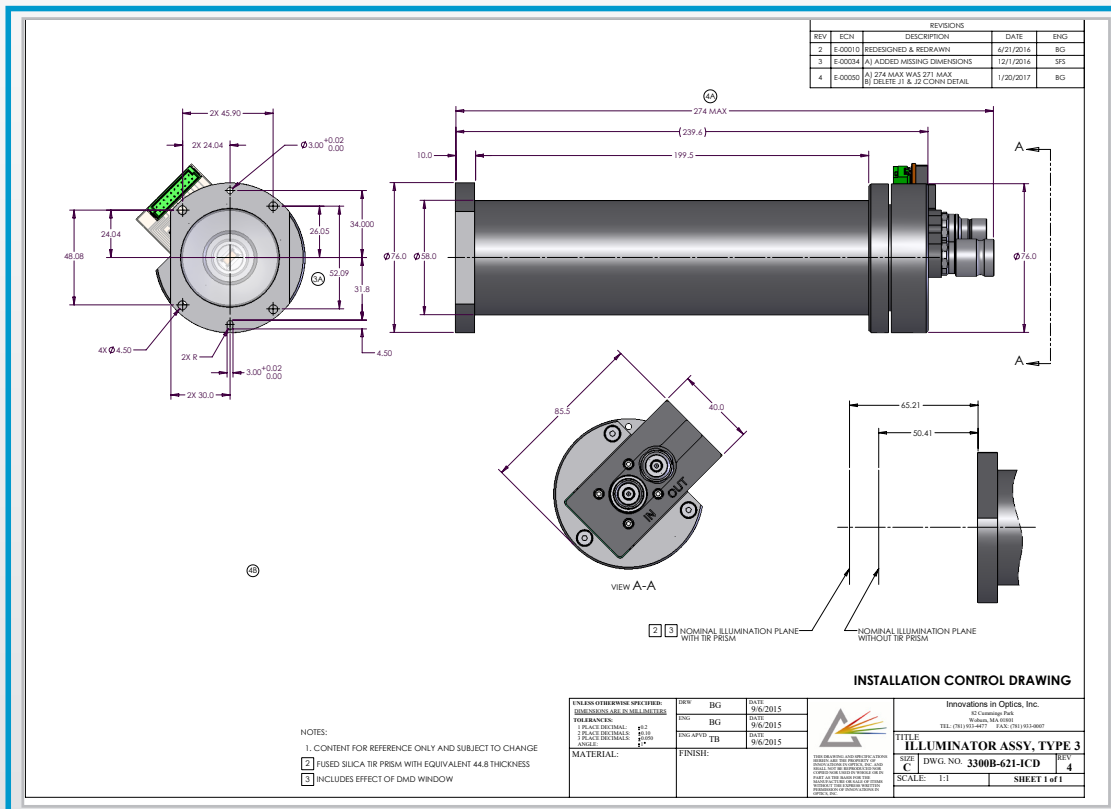
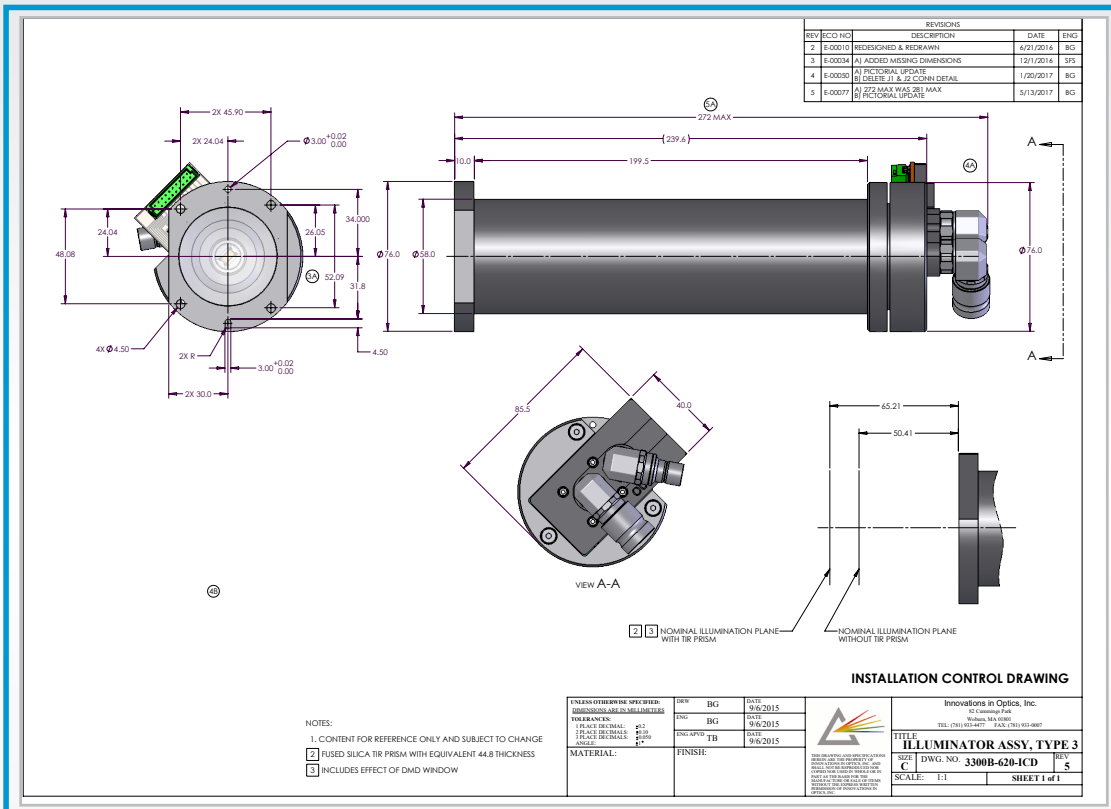
TIR PRISMS

Adding a TIR prism to the telecentric illumination enables a compact, on-axis design that minimizes field size and ensures a high degree of uniformity across the entire field. In addition, a TIR prism separates the illumination and projection axes so that the telecentric condition also produces uniform distribution of angles of incidence across the antireflection (AR) coated surfaces of the DLP chipset window to avoid spatial non-uniformities in projected brightness due to coating-performance variation with angle of incidence.

A TIR prism behaves optically as a thick, flat glass plate that elongates the optical path length (OPL) to the illumination plane. The ICD drawings specify the optical path length for a fused silica TIR prism with a refractive index of 1.46 and an OPL of 44.8 mm.

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LUMIBRIGHT UV 3300B INSTALLATION CONTROL DRAWINGS

