Low Noise Diode Laser System
DLL Series (UV-Visible)

Data Sheet

Overview

The DLL UV-Visible series is a family of ultraviolet and visible diode lasers with less than 1% noise that can deliver up to 1800 mW output power. The laser series is available in a wide range for wavelengths from 375nm to 730nm, and features a compact design, low noise, long operating lifetime, easy operation, and FDA-compliant system with driver. The laser is widely used in biological, medical, laser pumping, scientific research, medical imaging, flow cytometry, DNA sequencing, measurement, communication, spectrum analysis, and many other applications.

Features

- UV-Visible wavelength range
- CW operating mode
- Optical output power 10mW to 1800mW
- Low noise
- Ultra-compact design
- FDA compliant

Applications

- Biological
- Medical
- Laser pumping
- Scientific research
- Medical imaging
- DNA sequencing
- Flow cytometry
- Communication
- Measurement
- Spectrum analysis

375-405 nm Specifications

Parameter	DLL375		DLL395	DLL397	DLL400		DLL405	
Wavelength	375 nm		395 nm	397 nm	400 nm		405 nm	
Wavelength tolerance	±5 nm		±5 nm	±5 nm	±5 nm	±6 nm	±5 nm	±6 nm
Output power	>30 mW, >50 mW	>100 mW, >150 mW	>20 mW, >50 mW, >80 mW, >100 mW	>20 mW, >50 mW, >80 mW, >100 mW	>50 mW, >100 mW, >150 mW, >200 mW, >250 mW, >300 mW	>500 mW, 1000 mW	>50 mW, >100 mW, >200 mW, >300 mW, >400 mW	>500 mW, 1000 mW
Operating mode	CW							
Transverse mode	Near TEM_{00}	Multimode	Near TEM_{00}	Multimode	Near TEM_{00}	Multimode	Near TEM_{00}	Multimode
Noise of amplitude (rms, 20Hz-20MHz)	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%
Power stability (rms, over 4 hours)	<1%, <0.5%	<1%, <0.5%	<2%, <1%, <0.5%	<2%, <1%, <0.5%	<2%, <1%, <0.5%	<2%, <1%, <0.5%	<3%, 2%, <1%, <0.5%	<3%, 2%, <1%, <0.5%
M^2 factor	<1.5	/	<1.5	/	<1.5	/	<1.5	/
Beam diameter at aperture ($1/e^2$)	~3.0 mm	<1.5x3.5 mm	~3.5 mm	~3.5x1.0 mm	~2.5 mm	~3.0x2.5 mm	~2.5 mm	~3.0x2.5 mm
Beam divergence, full angle	<0.5 mrad	~2.3x0.2 mrad	<1.0 mrad	<2.0x0.5 mrad	~0.5 mrad	<2.5x1.0 mrad	~0.5 mrad	<2.5x1.0 mrad
Polarization ratio	>50:1, Horizontal ±5 degree	>50:1, Horizontal ±5 degree	>50:1 Horizontal ±5 degree	/	>50:1 Horizontal ±5 degree	>50:1, Horizontal ±5 degree	>50:1, Horizontal ±5 degree	>50:1, Horizontal ±5 degree
Warm-up time	<5 min	<5 min	<5 min	<5 min	<5 min	<5 min	<5 min	<5 min
Pointing stability after warm-up	<0.05	/	<0.05	/	/		/	
Operating temperature	10-35°C							
Modulation option	TTL/Analog: 1Hz-1kHz, 1kHz-10kHz, 10kHz-30kHz, 30kHz-100kHz							
Expected lifetime	10,000 hours							
Warranty period	10 months							

Remarks:

- Specifications of the CW laser is based on the laser performance at full power output after the specified warmup period. The stability of output power may change when output power is adjusted at a different power level.
- Specifications are subject to change without notice.

410-447 nm Specifications

Parameter	DLL410	DLL415	DLL442			DLL445			DLL447		
Wavelength	410 nm	415 nm	442 nm			445 nm			447 nm		
Wavelength tolerance	±5 nm	±5 nm	±10 nm	±5 nm		±5 nm			±5 nm		
Output power	>50 mW, >100 mW, >200 mW, >350 mW	>20 mW, >50 mW, >80 mW, >100 mW	>10 mW, >30 mW, >50 mW, >80 mW	>80 mW, >200 mW	>500 mW, >1000 mW	>30 mW, >50 mW, >80 mW	>200 mW, >500 mW	>1000 mW	>30 mW, >50 mW, >80 mW	>200 mW, >500 mW	>1000 mW
Operating mode	CW										
Transverse mode	Multimode	Near TEM_{00}	Near TEM_{00}	Multimode		Near TEM_{00}	Multimode		Near TEM_{00}	Multimode	
Noise of amplitude (rms, 20Hz-20MHz)	<1%	<1%	<1%	<1%		<1%	<1%		<1%	<1%	
Power stability (rms, over 4 hours)	<2%, <1%, <0.5%	<2%, <1%, <0.5%	<2%, <1%, <0.5%	<2%, <1%, <0.5%		<2%, <1%, <0.5%	<2%, <1%, <0.5%		<2%, <1%, <0.5%	<3%, 2%, <1%, <0.5%	
M^2 factor	/	<1.5	<1.5	/		<1.5	/		<1.5	/	
Beam diameter at aperture ($1/e^2$)	~3.5x1.0 mm mm	~3.5 mm	~3.5 mm	<2.5 x5.2 mm	<2x5 mm	~3.5 mm	<2.5 x5.2 mm	<2x5 mm	~3.5 mm	<2.5 x5.2 mm	<2x5 mm
Beam divergence, full angle	<0.5x2.0 mrad	<1.0 mrad	<1 mrad	<2.1 x1.6 mrad	<2.5x0 .2 mrad	<1 mrad	<2.1 x1.6 mrad	<2.5x 0.2 mrad	<1.0 mrad	<2.1 x1.6 mrad	<2.5x 0.2 mrad
Polarization ratio	/	>50:1 Horizontal ±5 degree	>50:1, Horizontal ±5 degree	/		>50:1, Horizontal ±5 degree			>50:1, Horizontal ±5 degree		
Warm-up time	<5 min	<5 min	<5 min	<5 min		<5 min	<5 min		<5 min	<5 min	
Pointing stability after warm-up	/	<0.05 mrad	<0.05 mrad	/		<0.05 mrad	/		<0.05 mrad	/	
Operating temperature	10-35°C										
Modulation option	TTL/Analog: 1Hz-1kHz, 1kHz-10kHz, 10kHz-30kHz, 30kHz-100kHz										
Expected lifetime	10,000 hours										
Warranty period	10 months										

Remarks:

- Specifications of the CW laser is based on the laser performance at full power output after the specified warmup period. The stability of output power may change when output power is adjusted at a different power level.
- Specifications are subject to change without notice.

450-462 nm Specifications

Parameter	DLL450			DLL454			DLL460			DLL462	
Wavelength	450 nm			454 nm			460 nm			462 nm	
Wavelength tolerance	±5 nm			±5 nm			±10 nm	±5 nm		±5 nm	
Output power	>30 mW, >50 mW, >80 mW	>200 mW, >500 mW	>1000 mW	>30 mW, >50 mW, >80 mW	>100 mW, >200 mW, >300 mW, >500 mW	>800 mW	>30 mW, >50 mW, >80 mW	>100 mW, >200 mW, >300 mW	>500 mW, >800 mW	>100 mW, >200 mW, >300 mW	>500 mW, >800 mW
Operating mode	CW										
Transverse mode	Near TEM_{00}	Multimode		Near TEM_{00}	Multimode		Near TEM_{00}	Multimode		Multimode	
Noise of amplitude (rms, 20Hz-20MHz)	<1%	<1%		<1%	<1%		<1%	<1%		<1%	
Power stability (rms, over 4 hours)	<2%, <1%, <0.5%			<2%, <1%, <0.5%			<2%, <1%, <0.5%			<2%, <1%, <0.5%	
M^2 factor	<1.5	/		<1.5	/		<1.5	/		/	
Beam diameter at aperture ($1/e^2$)	~3.5 mm	<2.5x5.2 mm	<2x5 mm	~3.5 mm	<2.5x5.2 mm	<2x5 mm	~3.5 mm	<2.5x5.2 mm	<2x5 mm	<2.5x5.2 mm	<2x5 mm
Beam divergence, full angle	<1.0 mrad	<2.1x1.6 mrad	<2.5x0.2 mrad	<1.0 mrad	<2.1x1.6 mrad	<2.5x0.2 mrad	<1.0 mrad	<2.1x1.6 mrad	<2.5x0.2 mrad	<2.1x1.6 mrad	<2.5 x0.2 mrad
Polarization ratio	>50:1, Horizontal ±5 degree			>50:1, Horizontal ±5 degree	/		>50:1, Horizontal ±5 degree	/		/	
Warm-up time	<5 min	<5 min		<5 min	<5 min		<5 min	<5 min		<5 min	
Pointing stability after warm-up	<0.05 mrad	/		<0.05 mrad	/		<0.05 mrad	/		/	
Operating temperature	10-35°C										
Modulation option	TTL/Analog: 1Hz-1kHz, 1kHz-10kHz, 10kHz-30kHz, 30kHz-100kHz										
Expected lifetime	10,000 hours										
Warranty period	10 months										

Remarks:

- Specifications of the CW laser is based on the laser performance at full power output after the specified warmup period. The stability of output power may change when output power is adjusted at a different power level.
- Specifications are subject to change without notice.

465-514.5 nm Specifications

Parameter	DLL465		DLL470	DLL488		DLL505	DLL510	DLL514
Wavelength	465 nm		470 nm	488 nm		505 nm	510 nm	514.5 nm
Wavelength tolerance	±5 nm		±10 nm	±5 nm		±5 nm	±5 nm	±1 nm
Output power	>100 mW, >200 mW, >300 mW	>500 mW, >800 mW	>100 mW, >200 mW, >300 mW, >500 mW, >800 mW	>30 mW, >50 mW	>200 mW, >300 mW, >500 mW, >800 mW, >1000 mW, >1500 mW, >1800 mW	>10 mW, >20 mW, >30 mW, >50 mW, >80 mW	>10 mW, >20 mW, >30 mW	>30 mW, >50 mW
Operating mode	CW							
Transverse mode	Multimode		Multimode	Near TEM_{00}	Multimode	Near TEM_{00}	Near TEM_{00}	Near TEM_{00}
Noise of amplitude (rms, 20Hz-20MHz)	<1%		<1%	<1%	<1%	<1%	<1%	<1%
Power stability (rms, over 4 hours)	<2%, <1%, <0.5%		<2%, <1%, <0.5%	<2%, <1%, <0.5%	<2%, <1%, <0.5%	<2%, <1%, <0.5%	<2%, <1%, <0.5%	<2%, <1%, <0.5%
M^2 factor						<1.5	<1.5	/
Beam diameter at aperture ($1/e^2$)	<2.5x5.2 mm	<2x5 mm	~1.5x3.0 mm	<2.0	~3.0x3.0 mm	~2.5 mm	~3.0 mm	~3.0 mm
Beam divergence, full angle	<2.1x1.6 mrad	<2.5x0.2 mrad	<2.5x0.5 mrad	~3.5 mm	~2.5x1.0 mrad	0.5 mrad	<1.0 mrad	<1.0 mrad
Polarization ratio	/		/	>50:1, Horizontal ±5 degree	>50:1, Horizontal ±5 degree	>50:1 Horizontal ±5 degree	/	/
Warm-up time	<5 min		<5 min	<5 min	<5 min	<5 min	<5 min	<5 min
Pointing stability after warm-up	/		/	<0.05 mrad	/	<0.05 mrad	<0.05 mrad	<0.05 mrad
Operating temperature	10-35°C							
Modulation option	TTL/Analog: 1Hz-1kHz, 1kHz-10kHz, 10kHz-30kHz, 30kHz-100kHz							
Expected lifetime	10,000 hours							
Warranty period	10 months							

Remarks:

- Specifications of the CW laser is based on the laser performance at full power output after the specified warmup period. The stability of output power may change when output power is adjusted at a different power level.
- Specifications are subject to change without notice.

520-642 nm Specifications

Parameter	DLL520		DLL633	DLL635		DLL637	DLL640	DLL642
Wavelength	520 nm		633 nm	635 nm		637 nm	640 nm	642 nm
Wavelength tolerance	±5 nm	±10 nm	±3 nm	+/-5 nm	±10 nm	±5 nm	±5 nm	±5 nm
Output power	>20 mW, >50 mW	>300 mW, >500 mW, >800 mW	>20 mW, >50 mW, >80 mW, >100 mW	>100 mW, >200 mW	>300 mW, >500 mW, >1000 mW	>100 mW, >200 mW	>100 mW, >200 mW	>100 mW, >200 mW
Operating mode	CW							
Transverse mode	Near TEM_{00}	Multimode	Near TEM_{00}	Near TEM_{00}	Multimode	Near TEM_{00}	Near TEM_{00}	Near TEM_{00}
Noise of amplitude (rms, 20Hz-20MHz)	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%
Power stability (rms, over 4 hours)	<2%, <1%, <0.5%		<2%, <1%, <0.5%	<2%, <1%, <0.5%	<2%, <1%, <0.5%	<2%, <1%, <0.5%	<2%, <1%, <0.5%	<2%, <1%, <0.5%
M^2 factor	<1.5	/	<1.5	<1.5	/	<1.5	<1.5	<1.5
Beam diameter at aperture ($1/e^2$)	~3.0 mm	~1.0x3.0 mm	~3.0 mm	~3.0 mm	~5x8 mm	~3.0 mm	~3.0 mm	~3.0 mm
Beam divergence, full angle	<1.0 mrad	<4.0x0.5 mrad	<1.0 mrad	<1.0 mrad	<3.0 mrad	<1.0 mrad	<1.0 mrad	<1.0 mrad
Polarization ratio	>50:1 Horizontal ±5 degree	/	>50:1 Horizontal ±5 degree	>50:1 Horizontal ±5 degree	/	>50:1 Horizontal ±5 degree	>50:1 Horizontal ±5 degree	>50:1 Horizontal ±5 degree
Warm-up time	<5 min	<5 min	<5 min	<5 min	<5 min	<5 min	<5 min	<5 min
Pointing stability after warm-up	<0.05 mrad	/	<0.05 mrad	<0.05 mrad	/	<0.05 mrad	<0.05 mrad	<0.05 mrad
Operating temperature	10-35°C							
Modulation option	TTL/Analog: 1Hz-1kHz, 1kHz-10kHz, 10kHz-30kHz, 30kHz-100kHz							
Expected lifetime	10,000 hours							
Warranty period	10 months							

Remarks:

- Specifications of the CW laser is based on the laser performance at full power output after the specified warmup period. The stability of output power may change when output power is adjusted at a different power level.
- Specifications are subject to change without notice.

650-685 nm Specifications

Parameter	DLL650		DLL655		DLL660		DLL680	DLL685
Wavelength	650 nm		655 nm		660 nm		680 nm	685 nm
Wavelength tolerance	+13/-5 nm	±12 nm	±10 nm		±5 nm		+10/-5 nm	±5 nm
Output power	>100 mW, >180 mW	>300 mW, >500 mW, >800 mW, >1000 mW	>100 mW, >180 mW	>300 mW, >500 mW, >800 mW, >1000 mW	>100 mW, >180 mW	>300 mW, >500 mW, >800 mW, >1000 mW	>300 mW, >500 mW, >800 mW, >1000 mW	>10 mW, >20 mW
Operating mode	CW							
Transverse mode	Near TEM_{00}	Multimode	Near TEM_{00}	Multimode	Near TEM_{00}	Multimode	Multimode	Near TEM_{00}
Noise of amplitude (rms, 20Hz-20MHz)	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%
Power stability (rms, over 4 hours)	<2%, <1%, <0.5%	<2%, <1%, <0.5%	<2%, <1%, <0.5%	<2%, <1%, <0.5%	<2%, <1%, <0.5%	<2%, <1%, <0.5%	<2%, <1%, <0.5%	<2%, <1%, <0.5%
M^2 factor	<1.5	/	<1.5	/	<1.5	/	/	<1.5
Beam diameter at aperture ($1/e^2$)	~3.0 mm	~10x5 mm	~3.0 mm	~10x5 mm	~3.0 mm	~5x8 mm	~5x8 mm	~3.5 mm
Beam divergence, full angle	<1.0 mrad	<3.0 mrad	<1.0 mrad	<3.0 mrad	<1.0 mrad	<3.0 mrad	<3.0 mrad	<1.0 mrad
Polarization ratio	>50:1 Horizontal ±5 degree	/	>50:1 Horizontal ±5 degree	/	>50:1 Horizontal ±5 degree	/	/	>50:1 Horizontal ±5 degree
Warm-up time	<5 min	<5 min	<5 min	<5 min	<5 min	<5 min	<5 min	<5 min
Pointing stability after warm-up	<0.05 mrad	/	<0.05 mrad	/	<0.05 mrad	/	/	<0.05 mrad
Operating temperature	10-35°C							
Modulation option	TTL/Analog: 1Hz-1kHz, 1kHz-10kHz, 10kHz-30kHz, 30kHz-100kHz							
Expected lifetime	10,000 hours							
Warranty period	10 months							

690-730 nm Specifications

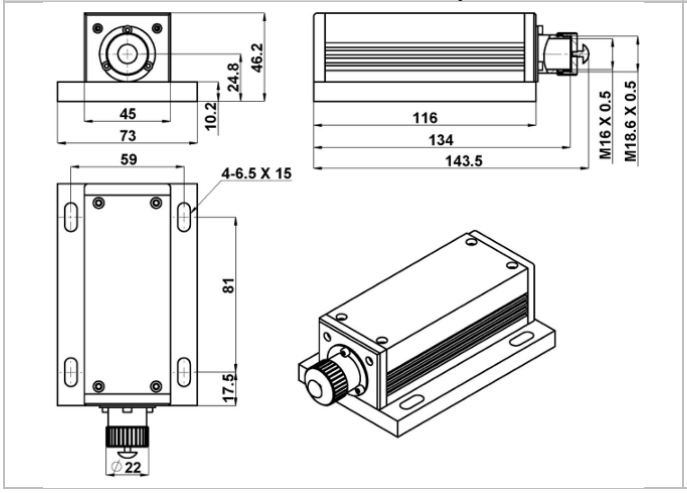
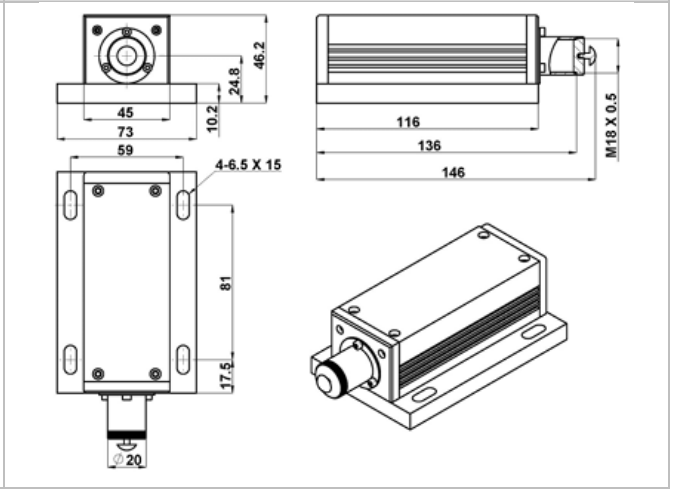
Parameter	DLL690	DLL705	DLL730	
Wavelength	690 nm	705 nm	730 nm	
Wavelength tolerance	±5 nm	±10 nm	±10 nm	
Output power	>300 mW, >500 mW, >800 mW, >1000 mW	>10 mW, >20 mW, >25 mW	>10 mW, >20 mW, >30 mW	>100 mW, >300 mW, >1000 mW, >1500 mW
Operating mode	CW			
Transverse mode	Multimode	Near TEM_{00}	Near TEM_{00}	Multimode
Noise of amplitude (rms, 20Hz-20MHz)	<1%	<1%	<1%	<1%
Power stability (rms, over 4 hours)	<2%, <1%, <0.5%	<2%, <1%, <0.5%	<2%, <1%, <0.5%	<2%, <1%, <0.5%
M^2 factor	/	<1.5	/	/
Beam diameter at aperture ($1/e^2$)	~5x8 mm	~3.0 mm	~3.0 mm	~5x8 mm
Beam divergence, full angle	<3.0 mrad	<1.0 mrad	<1.0 mrad	<3.0 mrad
Polarization ratio	/	/	/	/
Warm-up time	<5 min	<5 min	<5 min	<5 min
Pointing stability after warm-up	/	<0.05 mrad	<0.05 mrad	/
Operating temperature	10-35°C			
Modulation option	TTL/Analog: 1Hz-1kHz, 1kHz-10kHz, 10kHz-30kHz, 30kHz-100kHz			
Expected lifetime	10,000 hours			
Warranty period	10 months			

Remarks:

- Specifications of the CW laser is based on the laser performance at full power output after the specified warmup period. The stability of output power may change when output power is adjusted at a different power level.
- Specifications are subject to change without notice.

DLL Series (UV-Visible) Laser Head Dimensions

Unit: mm

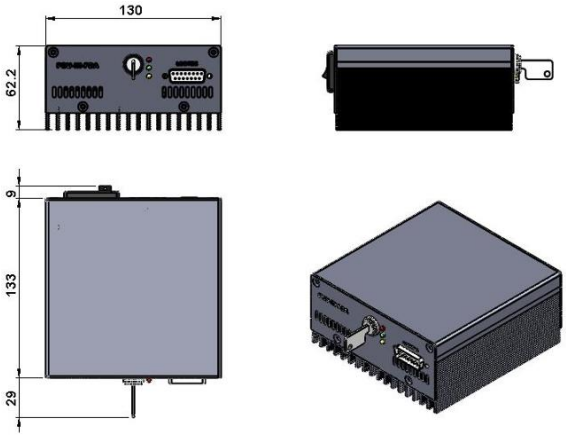
DLL Series (375, 397, 400, 405, 410, 442, 445, 447, 450, 454, 460, 462, 465, 470, 488, 520 nm), DLL-H Series	DLL Series (635, 650, 655, 660, 680, 690, 730 nm)
	

Parameter	DLL Series (375, 397, 400, 405, 410, 442, 445, 447, 450, 454, 460, 462, 465, 470, 488, 520 nm), DLL-H Series	DLL Series (635, 650, 655, 660, 680, 690, 730 nm)
Dimensions	143.5(L)×73(W) ×46.2(H) mm^3	146(L)×73(W) ×46.2(H) mm^3
Weight	0.7 kg	0.7 kg
Beam height from base plate	24.8 mm	24.8 mm

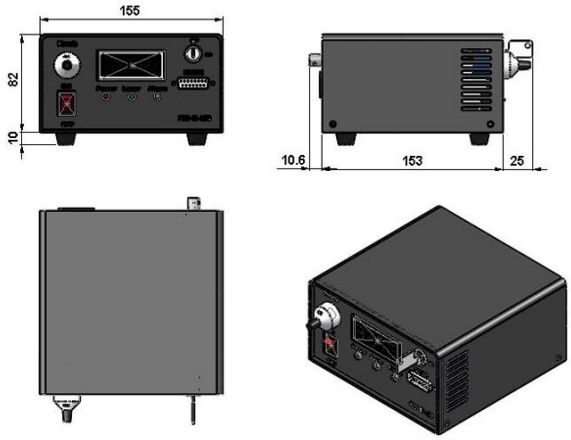
DLL Series (UV-Visible) Power Supply Dimensions

Unit: mm

Elite Power Supply



Laboratory Power Supply



A Version Laboratory Power Supply

Parameter	Elite Power Supply	Laboratory Power Supply	A Version Laboratory Power Supply
Dimensions	171(L) ×130(W) ×62.2(H) mm^3	188.6(L) ×155(W) ×92(H) mm^3	162(L) ×144(W) ×70(H) mm^3
Weight	1.2 kg	1.5 kg	1.0 kg
Input voltage	85-264VAC	85-264VAC	100-240VAC
Feature	Standard, Frequency 1Hz-30kHz	Adjustable power, Frequency 1Hz-30kHz	Adjustable power, LCD Display, Frequency 30kHz-100kHz

Ordering Information

For more information, please contact Lasermate directly at sales@lasermate.com.

Part Number Configuration DLL[1][2][3][4][5][6][7]							
DLL = Laser Model Series	**[1] = Wavelength**	**[2] = Transverse Mode**	**[3] = Output Power**	**[4] = Power Supply**	**[5] = Power Stability**	**[6] = Noise of Amplitude**	**[7] = Modulation**
	375= 375nm 395= 395nm … 685= 685nm 690= 690nm 705= 705nm 730= 730nm	Blank= Multimode H= Near TEM_{00}	10= >10mW … 1W= >1000mW 1H= >1500mW 1E= >1800mW	E= Elite Power Supply L= Laboratory Power Supply T= A Version Laboratory Power Supply	E=<3% 2=<2% D=<1% S=<0.5%	1= <1%	0=None T1=TTL 1Hz-1kHz T2=TTL 1kHz-10kHz T3=TTL 10kHz-30kHz T4=TTL 30kHz-100kHz A1=Analog 1Hz-1kHz A2=Analog 1kHz-10kHz A3=Analog 10kHz-30kHz A4=Analog 30kHz-100kHz

Note: The above specifications are subject to change without notice.