Blue Solid-State Laser System 488 nm, 10 to 50 mW

The Melles Griot 85 BDD series, directly doubled diode laser, combines the highest efficiency available in a 488 nm solid-state laser with features that make it an indispensable tool for a wide range of applications. Its compact size and turn-key controller make it easy to integrate into any system or instrument, and its superb beam quality and extremely low power consumption make it ideal for OEM use.

The 85 BDD is available with output power from 10 to 50 mW and features automatic power control (APC) for excellent power stability. Power is also adjustable from 10 to 110% of specified power. Modulation option is available. The 85 BDD series can be used as a direct replacement for air-cooled argon ion lasers in many bioanalytical and medical applications (e.g., flow cytometry, confocal microscopy, DNA analysis), thereby reducing power consumption from 1000 W to less than 15 W, vastly simplifying thermal management, and increasing system life.

85 BDD series lasers use a completely new platform with fewer parts than conventional diode-pumped solid-state lasers, thereby increasing stability, performance, and reliability while reducing manufacturing costs. Applications in metrology, defect inspection, and other fields are also possible.

Key Attributes

- Up to 50 mW at 488 nm
- Automatic power control (APC)
- Excellent beam quality ($M^2 < 1.2$)
- Low-noise output:
  rms: < 0.5%, 20 Hz to 1 MHz (typical)
  < 0.75% (maximum)
  peak-to-peak: < 1%, 20 Hz to 20 kHz
- Power consumption < 15 W
- Stable operation at baseplate temperatures from +10° to +55°C
  (45°C maximum for 50 mW)
- Solid-state reliability for long lifetime
- Minimal heat-sinking requirements

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Specifications

Beam Characteristics:

Output Wavelength[1]: 488 ± 0.5 nm

M^2: < 1.2

Transverse Mode: TEM_{00}

Beam Dimension ($1/e^2$): 0.70 ± 0.05 mm

Beam Ellipticity: 1.1:1

Far-Field Divergence ($1/e^2$): < 1.2 mrad

Polarization: Linear (Vertical ±5°), > 100:1

Stability Characteristics:

Power Stability:
±2% over 2 hours, ambient ±2°C

Pointing Stability: < 30 µrad

Amplitude Noise:

Peak-to-Peak: < 1% (20 Hz to 20 kHz)

rms: < 0.75% (20 Hz to 1 MHz),
< 0.5% typical

Static Alignment Tolerance[3]:

Beam Position: ±0.25 mm

Beam Angle: ±2.5 mrad

Operating Characteristics:

Warm-up Time: < 5 minutes

Maximum Heat Dissipation:

Laser head: 7 W

Controller: 8 W

Environmental Requirements:

Operating Temperature: 10°C to 40°C

Nonoperating Temperature: -10°C to +60°C

Operating Humidity: 0 to 95%, noncondensing

Baseplate Temperature: 10°C to 45°C

Shock: < 25 g (11msec)

Vibration: (5 to 500 Hz)
Operating: < 0.3 g (sinusoidal)
Nonoperating: < 3.0 g (sinusoidal)

Controller Heat Spreader Temperature[5]:
0 to +50°C

Electrical Characteristics:

Input Voltage: 100 to 240 Vac ±10%

Input Frequency: 50 to 60 Hz single phase

Computer Interface: RS-232

Input Power: < 15 W

Weight:

Laser Head: 0.5 kg (1.1 lb)

Controller: 0.39 kg (0.87 lb)

Mounting Surface Requirements:
Laser Head: flatness < 0.003 inches

Output Power[2]:

85-BDD-010-XXX: 10 mW

85-BDD-020-XXX: 20 mW

85-BDD-030-XXX: 30 mW

85-BDD-050-XXX: 50 mW

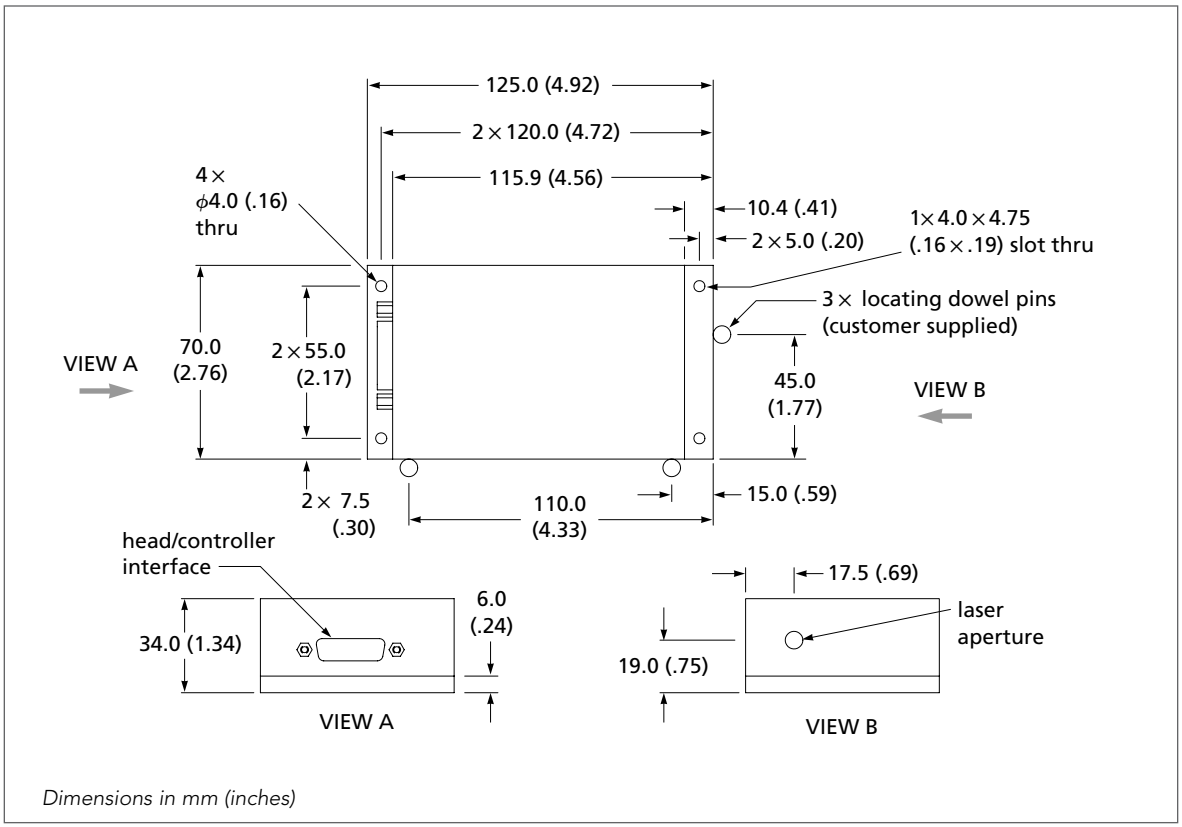
Power Cords:

XXX = 001 for 100 Vac, JIS 8303 (Japan)
002 for 115 Vac, NEMA 5-15P (U.S.A.)
003 for 230 Vac, CEE7/VII Schuko (Europe)
004 for 240 Vac, BS 1363/A (U.K.)
000 for OEM, no DC power supply
or power cord

1 Laser-to-laser tolerance.
2 Output power is adjustable via RS-232 or analog interface from 10% to 110%. Specifications are valid at 100% of specified power. Recommended power range is 70 to 110% power.
3 Static alignment tolerances are relative to the right bottom edge (see laser head drawing).
4 DC power must meet the following requirements:
Power >20 W; ripple < 5% peak-to-peak; line regulation < 0.5%.
5 Mounted on adequate heat-sinking surface meeting mounting surface requirements.

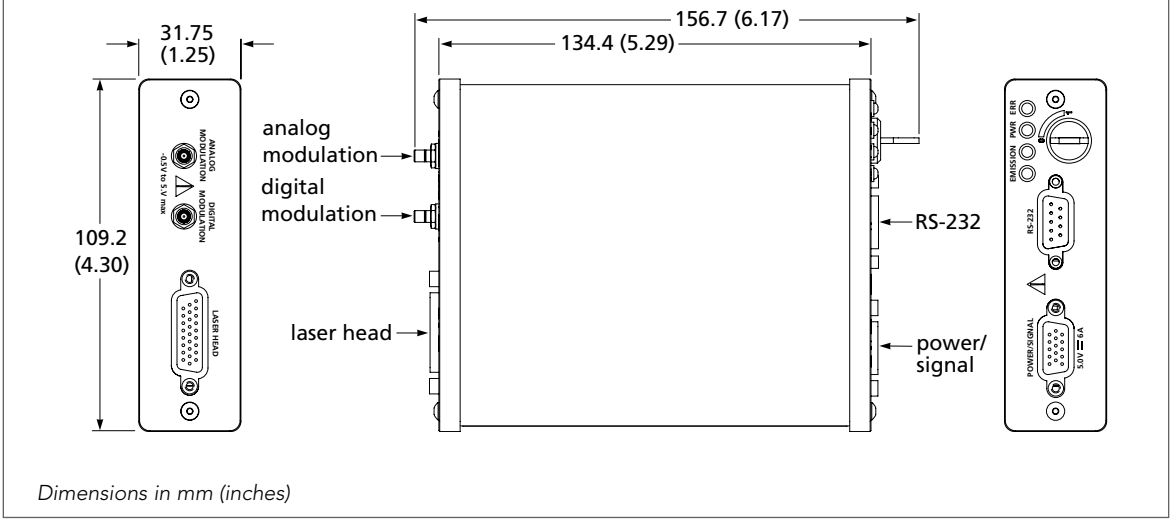
Melles Griot lasers and instruments are designed, tested, and manufactured for compliance with applicable electrical and laser safety standards.

MELLES GRIOT



Dimensions in mm (inches)

85 BDD series laser module

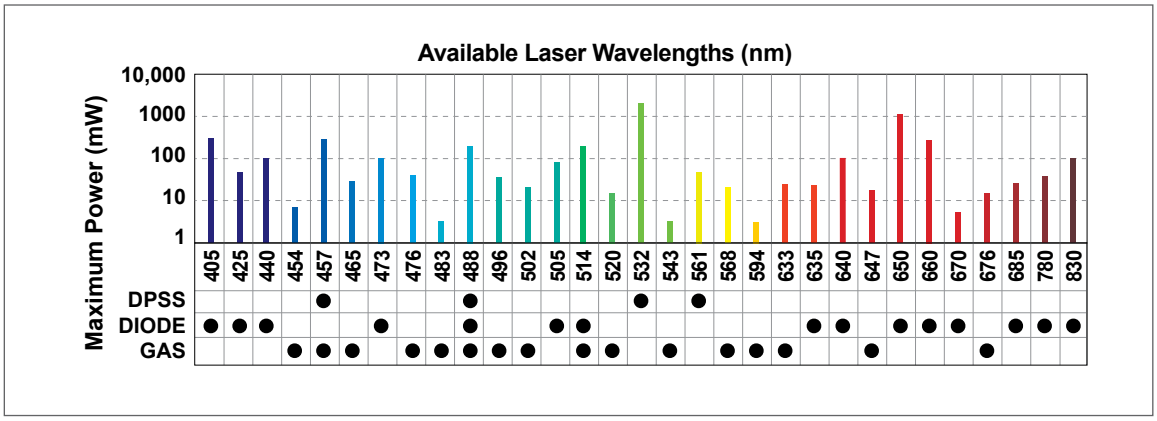


Dimensions in mm (inches)

85 BDD series turn-key controller

Select from more than 27 wavelengths

Melles Griot manufactures a comprehensive line of lasers and laser systems for laboratory and OEM applications. Standard products include helium neon lasers, diode-pumped solid-state lasers, argon, mixed gas ion lasers, and semiconductor laser assemblies. Available wavelengths range from 405 nm in the violet to 830 nm in the near infrared, with powers ranging from a few milliwatts to several watts, as shown in the chart below.



Spectral output available from Melles Griot lasers

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