



Specifications for Laser Amplifier

AUTHOR(S)	DATE	Document Change Notice, Release or Approval
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1. Description

Specifications for laser amplifier to be used in the LIGO 40m lab at Caltech.

Output power > 20 W CW, with nominal input from a 20 mW CW laser (1064 nm) with a 1 kHz linewidth.

Long term reliability: < 5% degradation in output power over 1 year of continuous (24 hrs / 7 days per week) usage.

Fiber coupled (PMF-FC/APC) input. Either fiber or free-space output.

2. Beam Shape

<10% non-TEM00 mode output for fiber coupled input

3. Power Requirements

Line Voltage: AC, 110V

Applies to laser amplifier, as well as to laser chiller (if water cooling is req'd)

4. Relative Intensity Noise (RIN)

- < 1% RMS (1 – 100,000 Hz)
- < 10^{-6} /rtHz (f > 1 kHz)
- < 3×10^{-7} /rtHz (f > 1 MHz)

5. Polarization

- a. Linear polarized input
- b. Linear polarized output (extinction ratio > 30 dB)

6. Diagnostics

Monitoring of laser electronics (pump diode voltage/current) and laser power. Available through standard serial or parallel interface.

External interlock connection for emergency shutoff triggered by safety system.