

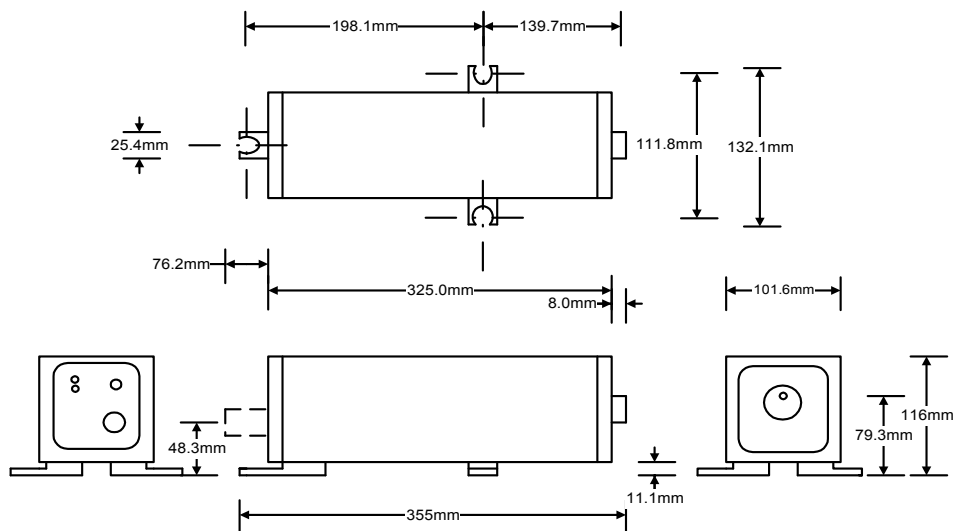
1001F LASER HEAD

- **0.6 m/sec Measurement Speed**
- **Zeeman Effect Frequency Stabilization Technique**

The EXCEL PRECISION 1001F Laser Head is a two-frequency Helium-Neon Laser System designed specifically for use with optical interferometers and associated detection and optics hardware. The primary use for the 1001F Laser Head is in the following equipment: optical wafer steppers, E-beam machines, I.C. inspection products, X-ray lithography steppers, precision measuring machines, HDD disc servowriter systems and ultra-precision machine tools.

Laser frequency stability is achieved by utilizing the principle of the Zeeman effect. A longitudinal magnetic field is applied to the laser tube, which causes the atomic level of neon to split into two energy levels. The frequencies of these two levels are essentially equally spaced about the center wavelength and are shifted proportional to the applied magnetic field strength. The laser tube therefore, is lasing at two frequencies with a frequency difference proportional to the magnetic field strength. These two frequencies are separated symmetrically with respect to the original frequency generated before the magnetic field is applied. Extremely high accuracy and repeatability can be achieved during measurement.

The high split frequency for Excel 1001F Laser Head allows the measurement speed to reach 0.6 m/sec (resolution dependent). It is compatible to all Excel optics products and can support up to 6 axes of measurement (6/ea. Interferometers and 6/ea. Receivers).





SPECIFICATIONS

Temperature (Operating)	0 -40 degrees C (32 - 104 F)
Power Requirements	2.5A @ 15V DC (Start up) 1.1A @ 15V DC (Operating)
Split Frequency	1.5 - 2.4 MHz
Vacuum Wavelength	632.99137 nm (nominal)
Frequency Stability	2×10^{-8} (nominal)
Pointing Stability	$< 0.1 \times 10^{-3}$ radians after fully warm up
Beam Diameter	6 mm typical
Laser Power Output	> 0.2 mW ; < 1 mW
Warm-up Time	Less than 15 minutes
Dimensions	35 x 13 x 11.5 cm
Signal Output	Differential square wave
Measuring Range	0 - 20 meters
Measuring Speed	Up to 0.6 m/sec (resolution dependent)