

# ZMI 7714 Laser Head

P/N's	DESCRIPTION
8070-0278-11	6 mm beam diameter
8070-0278-12	8 mm beam diameter

PHYSICAL CHARACTERISTICS	
Dimensions	See Figure
Weight	9.5 lb (4.3 Kg)
Materials	Casting- Aluminum, interface balls- 440C Stainless steel
Cooling Connectors	(2) 1/8 inch NPT, female
Nom. Cable Clearance	5.3 in. (135 mm)

ELECTRICAL	
Power Requirements (max)	+15 VDC $\pm 0.5V$ @ 2.1 A -15 VDC $\pm 0.5V$ @ 1.2 A -15 VDC inrush max 5 A for 20 msec
Total Heat Dissipation	< 8 W with user-supplied chiller

LASER BEAM CHARACTERISTICS	
Type	Helium-Neon, continuous wave, heterodyne
Beam Diameter	See P/N section
Min. Power Output	1.350 mW (6 mm beam) 1.250 mW (8 mm beam)
Frequency Difference	20 MHz $\pm 1600$ Hz
F1	Vertical polarization ( $\perp$ to plane defined by the three interface balls)
F2	Horizontal polarization ( $\parallel$ to plane defined by the three interface balls), F1 > F2
Maximum Power Difference Between Polarization's	5% of total power
Wavelength Stability Time	10 minutes typical @ 21.5 $\pm 1.5^\circ\text{C}$
Polarization Mixing (1):	< 0.25 nm
Time from turn-on to laser light	<30 sec. typical; 2 min. maximum
Beam Pointing Stability	<0.5 $\mu\text{rad}$ per $^\circ\text{C}$ ambient temperature change after wavelength is stable

LASER BEAM CHARACTERISTICS CONTINUED	
Static Beam Position (2)	$\pm 100 \mu\text{m}$
Static Beam Pointing (2)	$\pm 100 \mu\text{rad}$
Nominal Vacuum Wavelength	632.9911 $\pm 0.0005$ nm
Vacuum Wavelength Lifetime Accuracy	$\pm 0.1$ ppm
Vacuum Wavelength Stability	$\pm 1$ ppb ( $3\sigma$ ) over 24 hours $\pm 0.5$ ppb ( $3\sigma$ ) over 1 hour
DHHS Laser Safety Classification	Class IIIa, conforms to NCDRH regulations

ENVIRONMENTAL	
Operating Temperature	20 to 25 $^\circ\text{C}$
Maximum Rate of Ambient Temperature Change	1 $^\circ\text{C}$ per 30 minute period
Non-operating Temperature	-20 to 60 $^\circ\text{C}$
Operating Humidity	20 to 70%, noncondensing
Shock (non-operational)	11 milliseconds 40 G shock on each of three orthogonal axes

COOLING	
Active cooling with a user-supplied chiller is required to meet the specifications on this page.	
Chiller Requirements	cooled liquid at ambient temperature, stable to $\pm 0.1^\circ\text{C}$ , with a recommended flow rate of 0.5 liters per minute
Expected o-ring Lifetime	>50,000 hours of operation when used with a ZYGO approved coolant

1. The extinction of the unwanted beam component (vertical or horizontal), using a Wollaston prism (oriented at 0.00 $^\circ$  or 90.00 $^\circ$ ) with an extinction ratio of  $< 10^{-5}$ , will be less than 100 parts per million of the wanted beam component.
2. Static beam specifications are in reference to a line from the center of the rear interface ball, which is perpendicular to a line passing through the center of the two front balls.

