HUGHES
HUGHES AIRCRAFT COMPANY

Helium-Neon Lasers
For General Use

Proven Quality . . . Exceptional Reliability

The 3300 Series
For Laboratory Use

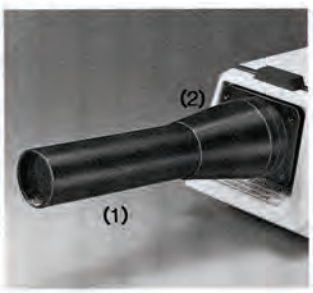
HUGHES

Simple operating features for safety and convenience

- BEAM ATTENUATOR (a). Enables user to block the beam without having to disengage the laser, prevents inadvertent eye exposure.
- INDICATOR LIGHT (b). Signals that power supply is on and laser is operating. INDICATOR LIGHT SERVES AS A WARNING OF LASER LIGHT.
- KEY ACTIVATED SWITCH (c). Discourages unauthorized use of laser. Built-in TIME DELAY inhibits laser from lasing for three to five seconds after key switch is turned to "ON" position and indicator light goes on.
- REMOTE CONTROL CONNECTOR (d). Allows for remote ON/OFF control via an external switch or safety interlock.

Available accessories for special requirements

1. COLLIMATOR (10x), Model 3970H. Expands laser beam ten times in diameter at point of exit, reducing beam divergence by the magnification factor. Other models available; please consult factory.



2. ADAPTER BEZEL, Model 3930H-2. Provides interface for Model 3970H collimator and other optional components.

3. ADAPTER, Model 3977H (1 inch x 32 threads per inch). Bolts directly to adapter bezel, is used for attaching a variety of optical components (not shown).

4. MOUNTING PLATE, Model 3930H-1. Permits laser to be secured to a mounting base, optical rail or optical bench.

5. MOUNTING POST, Model 3973H-4. Provides a convenient and inexpensive means for establishing an optical axis at a given height above an optical rail or bench.

Hughes Series 3300 lasers are sold worldwide. Within the United States all Series 3300 lasers and accessories are part of the Hughes QTA (Quick Turn Around) inventory. So your order — large or small — is available on short notice. Call or write today: Hughes Aircraft Company, Laser Products Marketing, 6155 El Camino Real, Carlsbad, CA 92008-4888. Phone (714) 438-9191, Extension 584.

Compact, easy-to-use lasers for laboratory, classroom and general use

The quality and reliability of Hughes hardseal helium-neon lasers have been proved through years of practical use in laboratories, industry and the field. Original equipment manufacturers rely on Hughes lasers for hundreds of applications.

Now Hughes has put these same lasers and their precisely matched power supplies into an attractive, convenient package for a broad range of laboratory and general uses.

These compact lasers are well suited for holography, data recording, spectroscopy, light scattering, velocimetry, nondestructive testing, interferometry, alignment systems and many other purposes.

The Series 3300 covers the 0.4 to 6.0 milliwatt range with choices to provide the user exactly the performance required. In addition, all standard Series 3300 lasers comply with Bureau of Radiological Health (BRH) requirements.

The Model 3309H, BRH Class II, systems are ideally suited for use as educational and demonstration tools because they require no special safety precautions. All models include a matched, well-regulated power supply plus controls and safety features necessary for consistent and safe operation.

Random and linear polarization are available for each power level. Also, 115 volt ac or the optional 230 volt ac power input may be selected. Several accessories are also available including collimator, accessory adapter, and optical rail mounting plate.

Built-in quality together with controlled life testing on all Hughes lasers and power supplies ensures long, trouble-free use. The good looks and functional packaging are pleasing added features.

MODEL NUMBER (Random) (Polarized)	3309H 3309H-P	3301H 3301H-P	3302H 3302H-P	3304H 3304H-P	3305H 3305H-P	3306H 3306H-P
Laser construction	Hardseal, coaxial, cold cathode					
Output power (mW) [TEM_{oo}, 632.8 nm]	0.4	1.0, min	2.0, min	4.0, min	5.0, min	6.0, min
Polarization information ("P" models only) Polarization extinction ratio: Plane of polarization:	 500:1 minimum Vertical					
Beam diameter, $1/e^2$ (mm)	0.64*			0.83		
Beam divergence (mrad)	1.3*			1.0		
Longitudinal mode spacing (c/2L) MHz	685			430		
Amplitude noise, rms (30 Hz - 10 MHz)	<1%					
Ripple, 10 Hz to 1 kHz, (p-p)	<0.5%					
Power variation in 8 hrs	<±2.5%			<±5.0%		
Power at turn-on (mW)	>.35	>.8	>1.6	>3.2	>4.0	>4.8
Angular drift — from cold start (mrad) After warm-up (mrad)	<0.2 <0.03			<0.3 <0.04		
Maximum warm-up time to full power	15 minutes					
Temperature: Operating Storage	0°C to + 40°C −20°C to + 70°					
Altitude: Operating Storage	Sea level to 10,000 feet Sea level to 70,000 feet					
Relative humidity: Operating	0 to 100% (without condensation)					
Size (HxWxL)	3.4 x 3.7 x 14.8 in (86 x 94 x 376 mm)			3.4 x 3.7 x 19.1 in (86 x 94 x 485 mm)		
Mass	4.5 lb (2.04 kg)			5.0 lb (2.27 kg)		
Power Supply	Integral with head. All solid state. Feedback regulated output current and start voltage, complete fault protection					
Input voltage (Single Phase)	115 Vac ± 10%, 60 Hz (Standard) 230 Vac ± 10%, 50-60 Hz* (Specify by ordering "F" version of basic model, i.e. 3309H-PF)					
Power consumption (W)	20					
Time delay from turn-on to light output	1 to 5 seconds					
BRH Class	II	IIIb				
BRH maximum power (mW)	1.0	5.0		10.0		

*Also available with 0.49 mm beam diameter and 1.7 mrad beam divergence. Specify by ordering "−1" version of the basic model, i.e., 3309H-PF-1. Also available as OEM version. Specify by ordering "M" version of basic model, i.e., 3309H-PFM-1.

Specifications subject to change without notice.

12 DIFFERENT MODELS FROM THE SAME SERIES ADAPT WELL TO ANY APPLICATION

FEATURING:

- High Quality
- BRH Certification
- Safe Operation
- Matched Power Supplies
- Available Accessories

TYPICAL APPLICATIONS:

- Holography
- Data Recording
- Spectroscopy
- Light Scattering
- Velocimetry
- Nondestructive Testing
- Interferometry
- Alignment Systems