PERKIN-ELMER

LASERS
LASER OPTICS

PERKIN-ELMER

Model 5200 Gas Laser:

DIFFRACTION LIMITED ☐ COLLIMATED ☐ COHERENT ☐ MONOCHROMATIC ☐ CONTINUOUS WAVE ☐ VISIBLE AND INFRA-RED ☐ RUGGED ☐ SIMPLE TO OPERATE

The Perkin-Elmer Model 5200 is a highly practical and rugged laser suitable for such field uses as surveying, alignment, metrology and interferometry. It is equally effective for research applications requiring a high quality laser output. The unique double-walled, compact gas discharge tube mounted coaxially in a heavy aluminum housing insures high reliability and ruggedness. Thus, the Model 5200 may be mounted in any orientation and still provide a stable output. Rotating the housing changes the plane of polarization of the output beam.

The Model 5200 employs a dc hot cathode discharge which provides a direct coupling to the plasma for efficient, positive control of the excitation and avoids rf interference problems. This discharge capillary is located inside the He-Ne gas reservoirs, and thus provides long life and constant output characteristics. High-precision Brewster's angle windows seal the ends of the tube and provide maximum transmission and low distortion of the exit beam.

Interchangeable mirrors, external to the laser tube complete a 30 cm resonant cavity. High quality Perkin-Elmer optical components permit operation in the fundamental transverse mode for diffraction limited optical performance. Mirrors for operation in the visible (6328Å) are supplied as standard, and accessory mirrors for 1.15μ or 3.39μ and for changing the cavity configuration are also available.

SPECIFICATIONS

OUTPUT WAVELENGTH: Standard wavelength: 6328 Angstroms (visible). Alternate: 1.15 or 3.39 microns (infrared).

LIGHT OUTPUT: Polarized. Fundamental mode: 0.5 milliwatt, minimum. Multiple mode: 1.5 milliwatts, minimum.

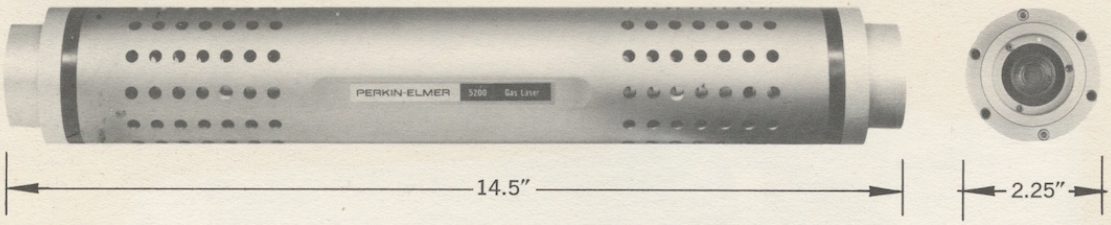
BEAM CHARACTERISTICS: Diffraction-limited. 30 centimeter resonator cavity length. Hemispherical mirror configuration, standard. Output beam: 2 mm diameter at 1% intensity points. Gaussian intensity distribution. Beam divergence: 0.5 milliradian.

RESONATOR ADJUSTMENT: Each mirror is mounted for simple, positive, non-interfering, orthogonal adjustment.

LIGHT MODULATION: Low index modulation of light intensity from dc through audio range using Model 5201 power supply. Approximately 50% peak-to-peak modulation from 100 kcs to 200 kcs using Model 5202 power supply.

ACCESSORIES: Screw-on, diffraction limited, collimating lens systems.

Model 5200 Gas Laser: THE PERKIN-ELMER MODEL 5200 LASER INSTRUMENT CONSISTS OF THE MODEL 5200 LASER AND ITS ASSOCIATED POWER SUPPLY, WITH INTERCONNECTING CABLES.



Housing: Cylindrical, thermally stable, coaxial to plasma tube. Cylindrical shape for structural rigidity, versatile mounting, and convenient rotation of plane of polarization. **Plasma Tube:** 2-mm-diameter capillary inside two 32-mm-diameter He-Ne reservoirs for constant output characteristics. **Resonator Interchange:** Simple interchange of mirrors, by unscrewing mirror retainer in end-assembly, changes resonator configuration and wavelength. **Accessory Mount:** Threaded adapter, photographic type, Series V. **Weight:** 3.2 lbs.

Power Supplies

Two power supplies are offered to energize the Model 5200 laser. The Model 5202 is recommended for such applications as optical testing or alignment. The Model 5201 is recommended for research, communication, and optical data processing applications or where its added control capability is required.

	Model 5201	Model 5202
High Voltage Output	Greater than 5 kv starting voltage. Greater than 1 kv, operating voltage, 1-10 ma. Current regulated and continuously adjustable	Greater than 5 kv starting voltage. Greater than 1 kv, operating voltage, 1-10 ma. Continuously adjustable
Current Regulation	$\pm 50\mu$a with line variation of 105 to 125 volts at 7 ma operation	None
Filament Output	2.5 vdc, 1.2 a, ripple less than 1%	2.5 v, 1.2 a, 60 cps
Required Input	115 v, 1.5 a, 60 cps	115 v, 1.5 a, 60 cps
Dimensions	12" high by 6" wide by 14" deep	12" high by 6" wide by 14" deep
Weight	21 lbs.	20 lbs.
Special Features	Six contact MS connector for external modulation or control. Typically, 5 v p-p input signal provides 5 ma p-p current modulation. External capacitor may be used for a-c modulation. 22 K input impedance. Input may be used to intensity modulate the laser beam, to permit external feedback loop or to remotely control laser. Provides −12 vdc, 5 ma output for external transistorized accessories.	BNC connector for external modulation. Requires ± 100 vac. Suitable for high level modulation between 100 kc and 200 kc

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For additional information or other specifications call or write:

ELECTRONIC PRODUCTS DIVISION
Main Avenue, Norwalk, Conn., 06852, (203) 847-0411
1725 Beverly Blvd., Los Angeles, California, 90026, (213) 483-6581
8555 16th Street, Silver Spring, Maryland, 20900, (301) 588-2244

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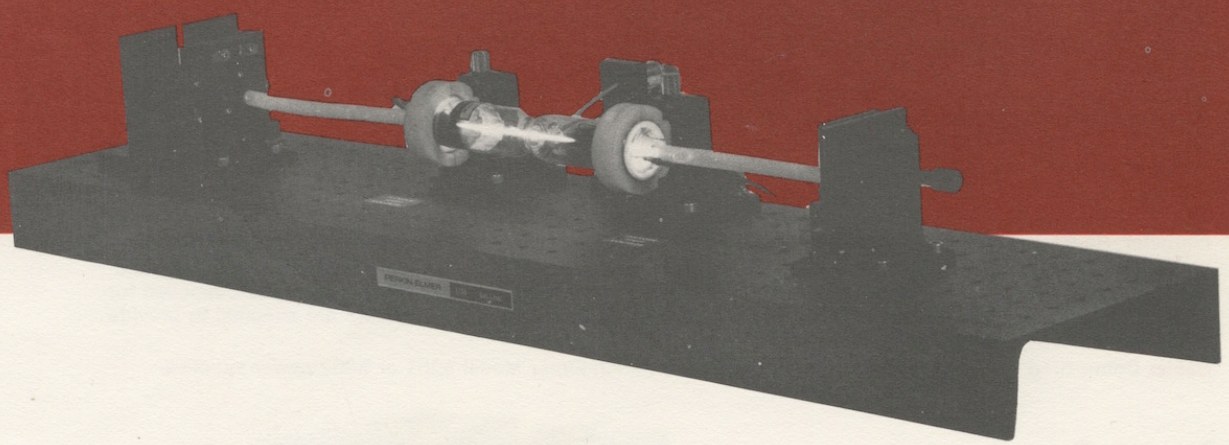


Model 5220 Modular Gas Laser

COHERENT □ CONTINUOUS WAVE □ ADJUSTABLE CAVITY □ DIRECT CURRENT EXCITATION □ DIFFRACTION LIMITED □ VISIBLE AND INFRA-RED.

The Perkin-Elmer Model 5220 Modular Gas Laser is a highly useful tool for advanced research and educational laboratories. It features a double-walled, compact gas-discharge tube and a selection of laser assembly units which provide broad flexibility for the experimental set-up.

The Model 5220 employs a dc hot cathode discharge. This is directly coupled to the plasma for efficient, positive control of the excitation. This arrangement also avoids rf interference problems. The discharge capillary, located inside the He-Ne gas reservoirs, provides long life and constant output characteristics. High-precision Brewster's angle windows seal the ends of the tube and provide for maximum transmission and low distortion of the exit beam.

The Model 5220 includes the plasma tube, the laser optical bench, adjustable tube mounts, adjustable mirror mounts, and multilayer dielectric coated mirrors. The mirror mounts rest on the specially designed flat optical bench, and are aligned to suit the experiment. A clamping bridge secures the mount to the bench for the duration of the experiment. The mirrors are adjusted by precision screws placed orthogonally on the mount. Alignment of the optical cavity for laser oscillation is achieved by adjustment of these mirrors. Alignment of the plasma tube is provided through precision screw-adjusted travel in horizontal and vertical planes. High quality, interchangeable mirrors, external to the laser tube complete a 60 cm resonant cavity. Mirrors for maximum power in fundamental mode at 6328Å are supplied as standard. Fundamental or multiple mode operation at other wavelengths can be provided by incorporating accessory mirrors for 1.15 microns or 3.39 microns and by changing cavity configuration.

The modular concept permits the application of the Model 5220 to numerous experimental arrangements. Included among these are multiple reflector systems, intracavity modulation or mode perturbation, dominant mode suppression by auxiliary optics, magnetic field effects on the plasma, and alignment procedures for the educational laboratory. Additional optical elements can be accommodated on the 8" x 36" laser bench.

SPECIFICATIONS

OUTPUT WAVELENGTH: Standard wavelength: 6328 Angstroms (visible). Alternate: 1.15 or 3.39 microns (infrared).

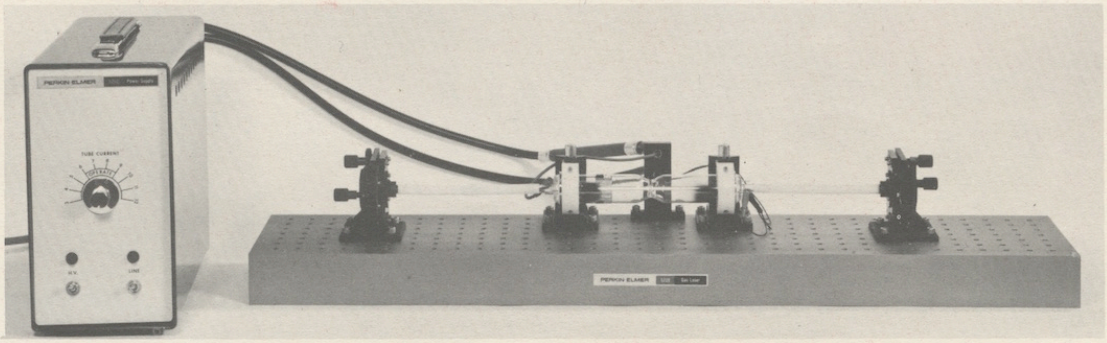
LIGHT OUTPUT: Polarized. Fundamental mode: 0.5 milliwatt, minimum. Multiple mode: 1.5 milliwatts, minimum.

RESONATOR ADJUSTMENT: Each mirror is mounted for simple, positive, non-interfering, orthogonal adjustment. Cavity dimensions may be changed to accommodate different experimental set-ups.

LIGHT MODULATION: Low index modulation of light intensity from dc through audio range using Model 5201 power supply. Approximately 50% peak-to-peak modulation from 100 kcs to 200 kcs using Model 5202 power supply.

Model 5220 Gas Laser:

THE PERKIN-ELMER MODEL 5220 CONSISTS OF THE MODEL 5220 BENCH ASSEMBLY, ITS ASSOCIATED POWER SUPPLY, AND INTERCONNECTING CABLES.



Optical Bench: Drilled and tapped for ¼-20 screws on 1-inch centers for easy, versatile mounting of all parts with accessory clamps provided. Inverted U-channel for structural rigidity. Size, 36" x 8" x 2¼".

Adjustable Mirror Mounts: Two-axis, precision-screw adjustment of mirror angle. Retainer and "O" ring facilitates changing mirrors to alter output beam dimensions and wavelength. Standard 15mm diameter mirror accepted (exclusive of micrometer hubs). (2 supplied).

Adjustable Tube Mounts: Plasma tube is supported by a mount at each end. Separate horizontal and vertical linear adjustments on each mount permit adjustment of tube orientation and height to achieve nominal beam elevation of 2 inches above surface of optical bench.

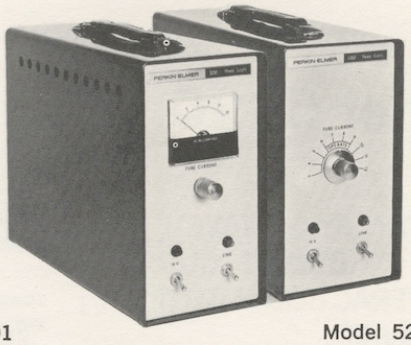
Plasma Tube: Helium-neon, for D.C. excitation, with 2-mm-diameter capillary coaxially inside two 32-mm-diameter He-Ne reservoirs for constant output characteristics. 11" nominal length, 1¼" diameter.

Reflectors: Selected mirrors for maximum intensity from one end of 5220 laser in either fundamental or multimode configuration. One set (2), Perkin-Elmer multilayer dielectrically coated for minimum loss, supplied for 6328 angstroms or 1.15 microns or 3.39 microns. Unless otherwise specified, mirrors are supplied to provide multiple mode operation at 6328Å.

Cable: Connecting cable and clamp for attachment to Perkin-Elmer Model 5201 or 5202 power supplies.

Power Supplies

Each of two power supplies can be used to energize the Model 5220 laser. The Model 5202 is recommended for such applications as optical testing or alignment. The Model 5201 is recommended for research, communication, and optical data processing applications or where its added control capability is required.



Model 5201 Model 5202

	Model 5201	Model 5202
Required Input	115 v, 1.5 a, 60 cps	115 v, 1.5 a, 60 cps
Dimensions	12" high by 6" wide by 14" deep	12" high by 6" wide by 14" deep
High Voltage Output	Greater than 5 kv starting voltage. Greater than 1 kv, operating voltage, 1-10 ma. Continuously adjustable	Greater than 5 kv starting voltage. Greater than 1 kv, operating voltage, 1-10 ma. Continuously adjustable
Current Regulation	±50μa with line variation of 105 to 125 volts at 7 ma operation	None
Filament Output	2.5 vdc, 1.2 a, ripple less than 1%	2.5 v, 1.2 a, 60 cps
Weight	21 lbs.	20 lbs.
Special Features	Six contact MS connector for external modulation or control. Typically, 5 v p-p input signal provides 5 ma p-p current modulation. External capacitor may be used for a-c modulation. 22 K input impedance. Input may be used to intensity modulate the laser beam, to permit external feedback loop or to remotely control laser. Provides —12 vdc, 5 ma output for external transistorized accessories.	BNC connector for external modulation. Requires ±100 vac. Suitable for high level modulation between 100 kc and 200 kc

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For additional information or other specifications contact:

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8555 16th Street, Silver Spring, Maryland, 20907, (301) 588-2244

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Model 5300 Gas Laser:

HIGH PERFORMANCE ☐ DIFFRACTION LIMITED ☐ COLLIMATED ☐ COHERENT ☐ MONOCHROMATIC ☐ CONTINUOUS WAVE ☐ VISIBLE AND INFRA-RED ☐ RUGGED ☐ SIMPLE TO OPERATE

The Perkin-Elmer Model 5300 is a practical, high performance laser suitable for research applications requiring a high quality laser output.

The gas discharge tube is mounted coaxially in a heavy cylindrical aluminum housing. This insures high reliability and ruggedness, and facilitates mounting the laser in a variety of orientations and allows rotation of the plane of polarization of the output beam.

The Model 5300 employs a dc hot cathode discharge which provides a direct coupling to the plasma for efficient, positive control of the excitation and avoids rf interference problems. High-precision Brewster's angle windows seal the ends of the tube and provide maximum transmission, low distortion, and plane polarization of the exit beam.

Interchangeable mirrors, external to the laser tube complete an 88 cm resonant cavity. High quality Perkin-Elmer optical components permit operation in the fundamental transverse mode for diffraction limited optical performance. Mirrors for operation in the visible (6328A) are supplied as standard, and accessory mirrors for 1.15μ or 3.39μ and for changing the cavity configuration are also available.

SPECIFICATIONS

OUTPUT WAVELENGTH: Standard wavelength: 6328 Angstroms (visible). Alternate: 1.15 or 3.39 microns (infrared).

LIGHT OUTPUT: Polarized. Fundamental mode: 8 milliwatts, minimum. Multiple mode: 15 milliwatts, minimum.

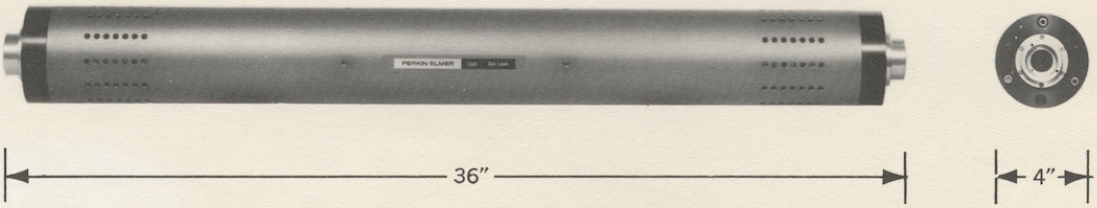
BEAM CHARACTERISTICS: Diffraction-limited. 88 centimeter resonator cavity length. Output beam: 3 mm diameter at 1% intensity points. Gaussian intensity distribution. Beam divergence: 0.3 milliradian.

RESONATOR ADJUSTMENT: Each mirror is mounted for simple, positive, non-interfering, orthogonal adjustment.

ACCESSORIES: Screw-on, diffraction limited, collimating lens systems.

Model 5300 Gas Laser:

THE PERKIN-ELMER MODEL 5300 CONSISTS OF THE MODEL 5300 LASER AND ITS ASSOCIATED POWER SUPPLY, WITH INTERCONNECTING CABLES.



Housing: Cylindrical, thermally stable, coaxial to plasma tube. Cylindrical shape for structural rigidity, versatile mounting, and convenient rotation of plane of polarization. **Plasma Tube:** 3-mm-diameter capillary. Two 32-mm-diameter He-Ne reservoirs. **Resonator Interchange:** Simple interchange of mirrors, by unscrewing mirror retainer in end-assembly, changes resonator configuration and wavelength. **Accessory Mount:** Threaded adapter, photographic type, Series V. **Weight:** 34 lbs.

Power Supply

High Voltage Output	Greater than 7 kv starting voltage. Greater than 1 kv, operating voltage, 1-10 ma. Continuously adjustable
Filament Output	
Required Input	2.5 v, 1.2 a, 60 cps 115 v, 1.5 a, 60 cps
Dimensions	12" high by 6" wide by 14" deep
Weight	20 lbs.
Special Features	BNC connector for external modulation. Requires ±100 vac. Suitable for high level modulation between 100 kc and 200 kc

Model 5302

PERKIN-ELMER

For additional information or other specifications contact:

ELECTRONIC PRODUCTS DIVISION
Main Avenue, Norwalk, Conn., 06852, (203) 847-0411
1725 Beverly Blvd., Los Angeles, California, 90026, (213) 483-6581
8555 16th Street, Silver Spring, Maryland, 20907, (301) 588-2244

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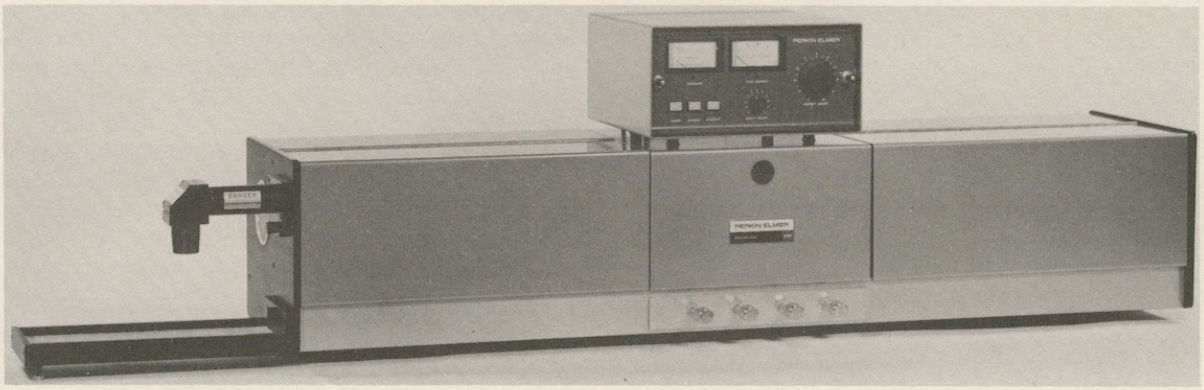
LASERS

Bulletin: ML-66-2
Effective Date: 5/30/66



Model 6200 — Molecular Gas Laser

The Model 6200 Molecular Gas Laser provides a minimum of 20 watts of coherent radiation at 10.6 microns. The beam is approximately 10 mm in diameter and is collimated to better than three times the diffraction limit. The beam can be focused by auxiliary optics producing a power density up to a megawatt/cm².

Description

The basic laser package is divided by a vertical rib running down the middle of the base plate. This vertical rib separates the laser into two sections. The foremost section contains the laser tube and the mirror mounts. The rear section contains electronics necessary to operate the laser. Hinged covers are provided so that the operator has ready access to the front compartment for mirror adjustments, etc., without being exposed to the high voltage section.

The end plates of the laser are specially designed to accept various accessories. Included with the basic laser is an assembly to bend the beam 90° and direct it down onto an asbestos-covered base plate also supplied as part of the laser.

A console is mounted on top of the laser unit containing the electrical controls and monitoring functions to operate the laser. Meters are provided to monitor vacuum and plasma-current. A special "on-off" switch is key-operated. A series of push buttons are provided for "power on," "stand by," and "operate." The "stand by" push button enables the operator to place samples in position without shutting down the laser completely.

Operation

The Model 6200 Molecular Gas Laser has been designed as a flowing gas system so that gas mixtures and pressures may be readily changed by the user. This design largely eliminates gas clean up and leak problems and further enables use of gases other than CO_2. Normal commercial grade gases are adequate and are fed into four pressure regulating valves, controlling the gas pressure delivered to the mixing manifold and its associated control valves. The gas passes through the mixing manifold into the plasma tube where it provides lasing action and then it is evacuated by a standard commercial vacuum-pump. The laser tube is powered by two 60-cycle high voltage transformers connected to three electrodes.

Safety Features

The extremely high c-w output power of the Model 6200, together with the invisible nature of the radiation, is hazardous. A ¼" diameter beam can produce an extremely severe third degree burn with approximately a one-second exposure. The Model 6200 has been designed with all possible safety precautions. The beam is completely enclosed within the laser assembly itself, so that, when the operator is adjusting the mirror mounts, there is no possibility of hazardous exposure to the laser beam. Interlocks have been provided on the rear sections of the sheet metal covers so that there is no high voltage present when these covers are opened.

The laser is supplied with an output assembly that directs the beam downward onto an asbestos platform. Both the output assembly and the asbestos platform are mounted to the end plate of the laser. Each has electrical interlocks with the high voltage section. The laser will not emit radiation unless these two devices are in place. A red light has been provided on the front panel of the laser itself to further warn the operator that the laser is operating. At all times, when using this unit, the operator and any other persons in the vicinity of the laser should wear protective glasses that cannot transmit 10.6 micron radiation.

Applications

The extremely high c-w power densities available with the Model 6200 Laser make it a strong candidate as a source for micro-welding, machining and resistor trimming in the electronics field. The concentrated beam will vaporize most materials. This suggests numerous applications in various analytical fields such as gas chromatography and atomic absorption spectroscopy, where direct vaporization of samples would be extremely useful. The 10.6 micron radiation is not significantly attenuated by the atmosphere, and thus, possibilities for long-range communication and data transmission exist. The Model 6200 should also find application in various fields of medical research.

Specifications and Dimensions

Outout Wavelength: 10.6 microns

Output Power: 20 watts minimum quasi-cw (120 cps modulation)

Beam Characteristics: nominal 10 mm diameter, collimated to better than 3x diffraction limit

Resonator Adjustment: each mirror mounted for simple, positive, non-interfering, orthogonal adjustment, on slide V-ways for axial positioning

Electrical Requirements: 115 volts, 60 cycles, 15 amperes

Gas Consumption: standard cylinder of gas permits minimum 50 hours of operation

Molecular Laser: 12" high, 12⅝" deep, 60" wide approx. weight 200 lbs. less pump

Control Console: 7¼" high, 12" deep, 14½" wide approx. weight 44 lbs.

Accessories

Focusing lens in detachable assembly, 2 inch focal length

Sample stage mounted on three-axis micropositioner

For additional information or other specifications call or write:

PERKIN-ELMER
ELECTRONIC PRODUCTS DIVISION
Main Avenue, Norwalk, Conn. 06852 / Telephone: (203)-847-0411

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PRICE LIST

PL-1-3

Effective date: July 1, 1966
Supersedes all previous issues

CONTINUOUS WAVE GAS LASERS

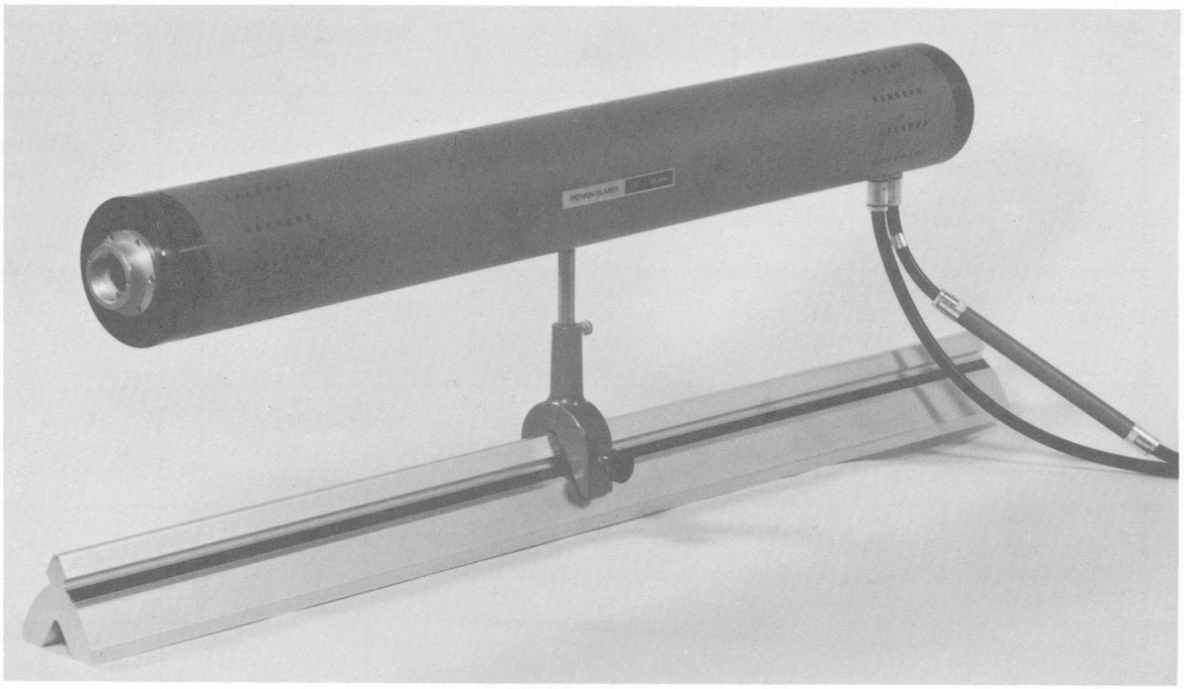
MODEL NUMBER	LIST PRICE
5200 Laser/5202 Power Supply	$1,975.00
5200 Laser/5201 Power Supply	2,450.00
5220 Laser/5202 Power Supply	1,975.00
5220 Laser/5201 Power Supply	2,450.00
5230 Laser/5302 Power Supply	2,950.00
5230 Laser/5231 Power Supply	3,450.00
5300 Laser/5302 Power Supply	4,450.00
5320 Laser/5302 Power Supply	4,450.00
*6200 Laser and Power Supply	8,950.00

Delivery of above Lasers and Power Supplies is two weeks ARO.

*Delivery of Model 6200 is 90 days ARO pending prior sale.

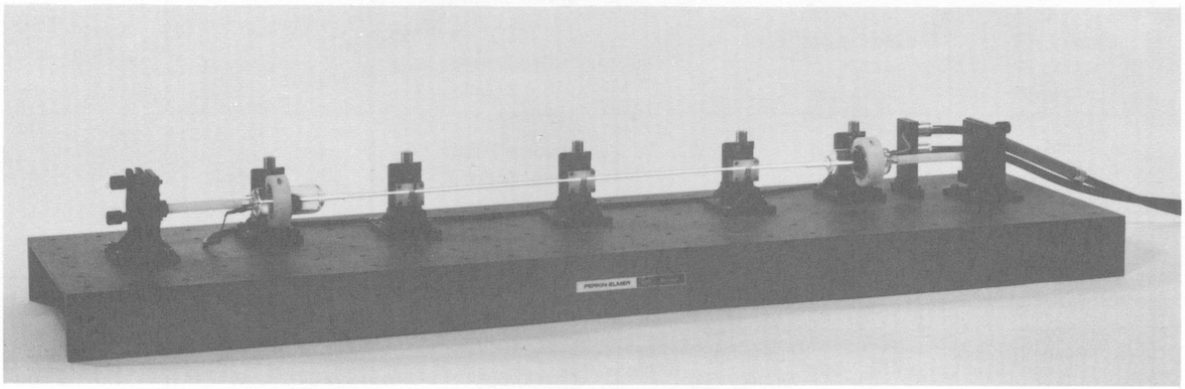
Terms: Net 30 days from the date of invoice. F.O.B. Norwalk, Connecticut

Prices contained herein are subject to change without notice.



MODEL 5300 GAS LASER

The Model 5300 gas laser is a high performance device embracing the same rugged, cylindrical, mechanical design used in the Model 5200. Thus the same reliability, simplicity and ease of operation found in Model 5200 has been extended to an instrument providing over 10 times more power in a package only 2½ times larger.



MODEL 5320 GAS LASER

The Model 5320 is a modular version of the 5300. This instrument includes a 48 x 12 x 2¼ inch channel-shaped optical bench with spaced tapped holes for easy mounting of parts, mirror mounts with precision orthogonal 2-axis rotational adjustments, plasma tube and associated mounts providing 2-axis lateral adjustments, high efficiency precision mirrors plus connecting cable assembly and power supply. The high-gain tube and modular design offer maximum versatility for intra-cavity experimentation.