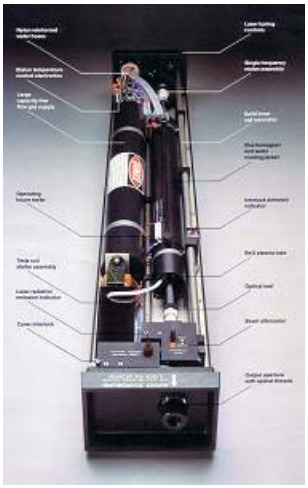
LEXEL LASER

TECH INFO

FEATURES OF LEXEL LASERS: LASER HEAD

The Lexel laser head combines the plasma tube, resonator structure, and laser optics in the most advanced, compact and functional design. An extensive engineering effort was expended to perfect each component in the laser head. The resulting package yields unmatched stability, reliability, and ease of operation, along with the most advanced safety features.



The Lexel laser head components and features described below are the same in all Lexel models The different power level lasers differ only in the size of the plasma tube, length of the laser resonator and the specific laser mirrors.

To view a close-up picture of a Lexel laser head, click the photo at right.

Be0 plasma tube

The Lexel plasma tube with exclusive Be0 ceramic and metal construction is **the strongest, most compact and most reliable design available for ion lasers**.

Large capacity free flow gas supply

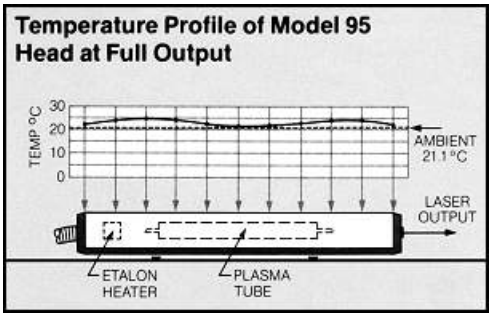
This large stainless steel gas supply tank maintains operating gas pressure with **no need for fill valves or pressure monitoring**.

Electromagnet and water cooling jacket

An extremely compact electromagnet provides the high axial magnetic field required for efficient plasma tube operation.

The assembly also serves as a water cooling jacket completely enclosing the plasma tube so that the heat is efficiently removed from the laser head without affecting the optical resonator structure.

The heat removal is so effective that **there is less than a 3°C temperature variation along the laser head.** Run your hand over the case of a Lexel laser operating at full power: it is scarcely possible to detect the thermal change. Do the same thing with other commercial ion lasers and there will be definite hot areas near the ends of the plasma tube. The beneficial effect on amplitude and beam-pointing stability is just as dramatic.



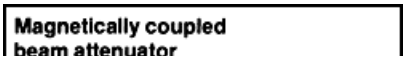
Solid Invar® rod resonator

Lexel's unique optical resonator holds the plasma tube and optics in precise alignment and provides the ultimate in low thermal expansion and solid mechanical stability

Optical seal

This exclusive, patented seal protects the optical cavity from dust and contamination. It is so effective that **Lexel lasers commonly operate one to two years without needing optical cleaning.**

Beam attenuator



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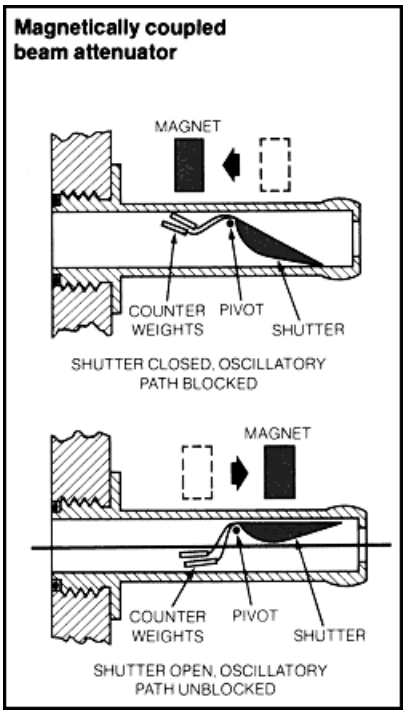

This intracavity shutter **(patent pending)** conveniently blocks all laser output with a flick of the lever. Magnetic coupling through the optical dust cover maintains complete seal integrity. It complies with CDRH requirements.

Output aperture with optical threads

The output mirror retainer provides access to the transmitter mirror and has 3/4"-32 threads for attaching accessories An optional 1"-32 adapter is also available

Laser radiation emission indicator

This highly visible indicator provides a warning whenever the laser is operational. It complies with CDRH standards.

Cover interlock

This interlock turns off the laser if the cover is removed from the laser head. Its purpose is to prevent accidental exposure to dangerous voltages or any laser radiation that could exist inside the laser head cover.

Interlock defeated indicator

A visual indication, as required by CDRH standards, is provided if the head cover is removed and the safety interlock defeated.

Tesla coil starter assembly

A reliable Tesla coil circuit provides the high energy spark required to ionize the gas and start discharge current in the plasma tube.

Operating hours meter

The total operating time accumulated on the plasma tube is recorded here, enabling the laser user to easily monitor tube life.

Nylon reinforced water hoses

We use reinforced water hoses that will not burst with pressure surges as has happened with rubber hoses used by others.

Interconnection cable

The electrical wiring and water hoses are neatly housed in a flexible interconnection cable which disconnects at the power supply.

Single-frequency etalon assembly

The Lexel Model 503 Temperature Controlled Etalon Assembly mounts directly on the Invar® rod resonator structure using the same type of kinematic suspension system used to mount the laser mirrors. This patented etalon design is solidly integrated into the optical system to yield **the most stable single-frequency operation obtainable from an ion laser.**

Etalon temperature control electronics

The printed circuit card electronics hold the etalon oven temperature to the precise level required for single frequency control.

Full access to inside of laser head

Removing the cover allows access to any component in the laser head. Everything is accessible down to the base plate.

Adjustable feet

Four adjustable feet will allow the height of the laser to be adjusted over a 15 mm range. The feet can also be removed and the laser bolted into position using the 1/4"-20 tapped holes.

Custom laser head variations

Customers such as Original Equipment Manufacturers who purchase a quantity of lasers to be built into their equipment can have special variations to the laser head. Such variations may include different size base plate, slightly different component layout or a non-enclosed system.

Single-frequency operation < LAST PAGE

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