

FIR SERIES

FAR Infrared lasers/Terahertz lasers



Edinburgh Instruments optically pumped FIR (Terahertz) lasers provide coherent radiation in the range of $40\ \mu\text{m}$ to $1.22\ \text{mm}$ ($0.25\ \text{THz}$ – $7.5\ \text{THz}$). When combined with the PL Series of CO_2 lasers, the FIR laser becomes a powerful tool for laser line measurements at high peak powers.

295

The model 295 is a standalone FIR laser designed for operation with high power CO_2 lasers. Guaranteed powers of 150 mW when pumped by the PL5, and 500 mW when pumped by the PL6, are available at $118.8\ \mu\text{m}$ and $184.3\ \mu\text{m}$. The output beam diameter is 11 mm (PL5 pump) or 13 mm (PL6 pump).

The 295 has a 3 bar invar support frame and allows UHV pumping for extended sealed operation.

395 Twin Laser

The 395 features two identical FIR laser cavities within a single 5 bar invar stabilised frame. This is particularly designed for applications where two FIR outputs with a frequency offset are required, such as plasma diagnostics.

Both FIR cavities are pumped by a single PL6 laser to ensure optimum stability of the Intermediate Frequency (IF). Each of the two outputs can be optimised individually and it has a beam diameter of 13 mm.

FIRL-100

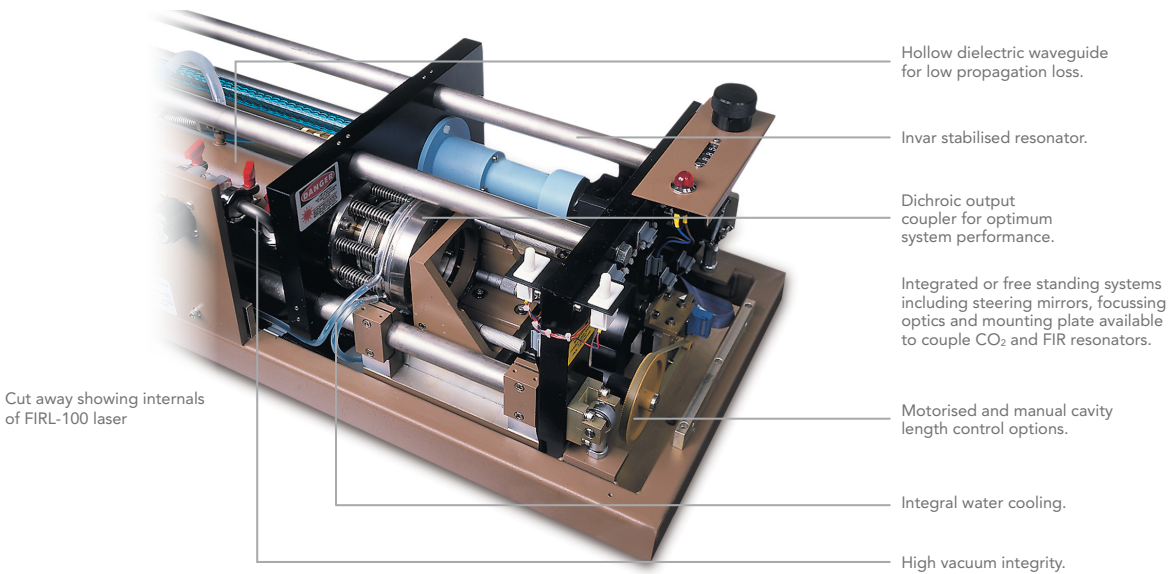
The FIRL-100 has both a CO_2 pump laser and an FIR laser combined into a single compact unit. The lasers and coupling optics are mounted within a stable 5 bar invar rod frame. The output FIR beam diameter is 11 mm.

The CO_2 section provides 80 lines between $9.1\ \mu\text{m}$ and $10.9\ \mu\text{m}$ with $>50\ \text{W}$ on the strongest lines. Mode performance ($M^2 < 1.25$) is assured by internal profiling of the tube and the use of high-quality optics. The resonator design features a diffraction grating, two ZnSe Brewster windows and a ZnSe output coupler.

Access to the CO_2 radiation beam diagnostics for Infrared experiments is available via a precision, two position sliding mirror mechanism.



SPECIFICATIONS



FIRL-100 Technical Specifications

Tuning Range	40 μm to 1.222 mm
Mode	> 90% TEM ₀₀ on main mode
Beam Diameter	11 mm
Polarisation	Parallel or perpendicular to input pump laser (depends on FIR laser gas and line)
CO₂ Laser Output	80 lines accessible at 9.1 μm – 10.9 μm 50 W on the strongest line
Cooling	Closed cycle thermocirculator

FIRL-100 Output of selected lines

Wavelength (μm)	FIR Molecule	CO ₂ pump line	Typical Power
96.5	CH ₃ OH	9R10	60 mW
118.8	CH ₃ OH	9P36	150 mW
184.3	CH ₂ F ₂	9R32	150 mW
432.6	CH ₃ OH	9R20	30 mW
513.0	CH ₃ OH	9R28	10 mW

FIR Series accessories include:

Laser stabilisers –

For applications demanding excellent medium and long term stability, an active stabiliser may be required. This will compensate for laser output fluctuations caused by changes in ambient conditions and lock the variation in laser frequency or power to a value close to the passive jitter.

Laser Pumping and Refilling Systems –

All flowing gas laser systems are supplied with the necessary valves, gauges and vacuum couplings. A range of turbo molecular and dry scrolling pumps are available.

Gas Mixing Stations –

Designed to allow mixing and metering of up to 3 component gases from independent gas cylinders. These comprise 3 inlet ports, each with their own needle valve control, with individual flow meters.

Customer support is available worldwide.

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PROTECTIVE GLASSES ARE AVAILABLE FOR THE FIR SERIES OF CO₂ LASER.