Fiber-Pigtailed Sapphire Lasers

Coherent Inc. has introduced a new range of fiber-pigtailed (FP) lasers into its well-established portfolio of FP products. The new Sapphire™ FP lasers are compact, CW, visible lasers that offer a unique combination of low noise and exceptional output stability. These lasers are available at seven wavelengths (458 nm, 488 nm, 514 nm, 532 nm, 552 nm, 561 nm and 588 nm), at output powers of up to 120 mW. They are nominally configured with 1 meter of single-mode, polarization-preserving fiber, terminating in a standard FC/APC 8° connector, thus simplifying their use in standalone applications or integration into OEM instruments.

Sapphire FP pigtailed lasers achieve a unique combination of low noise and exceptional output stability due to several factors. The first is the use of the field-proven (over 25,000 units) Sapphire laser platform that delivers a circular output beam with the industry's lowest beam drift thereby enabling efficient coupling. Second is the use of a rugged permanent fiber-pigtailing using PermAlign™ technology rather than an air-launched setup using multi-axis adjustable mounts which nearly always drift over time. The superior stability enabling design is to make the fiber an integral part of the resonator plate featuring PermAlignTM technology, physically completely independent of the outer housing. As a result, Sapphire FP lasers deliver excellent output stability (< ±2% over 2 hours ± 3°C after warm-up), low noise (< 0.25% RMS at 10 Hz to 2 MHz) and a broad ambient temperature operating range (10 to 40°C). In addition, a special fiber termination allows the operation of Sapphire FP lasers at short wavelengths and/ or high powers without fiber degradation or damage.

Applications for Sapphire FP include the life sciences, metrology, and inspection. Typical examples are fluorescence-based techniques, where fiber delivery is commonly utilized to facilitate miniaturization, such as flow cytometry or confocal microscopy. Moreover, the wavelength scalability of Sapphire's optically pumped semiconductor laser (OPSL) technology enables optimum excitation of target fluorophores.

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