

ORS-Compact

Ultrastable Laser System



The ORS-Compact Ultrastable Laser System is designed for high performance in demanding field applications. It delivers ultra-narrow linewidth laser light with outstanding frequency stability.

The system's centerpiece is a high-finesse Fabry-Pérot cavity (cubic spacer with a length of 5 cm) serving as a reference for a CW laser. The cavity is made out of ultra-low expansion glass (ULE) and is operated in vacuum at the point of zero thermal expansion. The reference cavity is actively decoupled from vibrations and acoustically isolated allowing for ultimate performance also in rough laboratory environments. Rigid mounting of the cavity ensures portability without realignment of the optical paths.

The system is operated by the newest generation of Menlo Systems' proprietary SYNCRO controller—a modular electronics platform designed for versatility and intuitive use. It incorporates all required electronics, e.g., a low-noise laser driver and a very fast (analog) servo loop for laser frequency stabilization. The user controls all parameters using either the 7" front-panel touchscreen or a GUI on a remote PC. The onboard software ensures automatic cavity locking and system monitoring.

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KEY SPECIFICATIONS

- Stability $<1.5 \times 10^{-15}$ at 1 s (with FS-XTAL Option)
- Linewidth <1 Hz
- Output Power >10 mW
- Wavelength
500–1600 nm (IBS Coatings),
900–1600 nm (Crystalline Coatings)

APPLICATIONS

- Quantum Computing
- Optical Clocks
- Ultra-low Noise Microwave Generation
- Frequency Comb Stabilization
- High Resolution Spectroscopy
- Laser Cooling and Trapping

OPTIONS

- Fused Silica Mirrors (FS-IBS)
- Crystalline Mirror Coatings (FS-XTAL)
- Mirror Coating for Multiple Wavelengths
- EOM Sideband Lock (Tunable Frequency Shift)
- AOM Frequency Shift
- Fiber Noise Cancellation
- Second Harmonic Generation
- High Output Power
- Cavity De-drifting
- Digital Servo Interface for Stabilization to External Atomic Transition

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SPECIFICATIONS

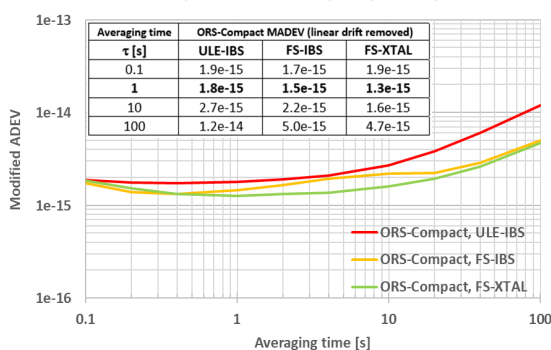
Wavelength	500–1600 nm (IBS Coatings), 900–1600 nm (Crystalline Coatings)
Stability (MADEV at 1 s, Linear Drift Removed)	1.5×10^{-15} (with FS-XTAL Option) 2×10^{-15} (with FS-IBS Option) 3×10^{-15} (Standard System)
Linewidth	1 Hz
Phase Noise (Laser Source Dependent)	-44 dBc/Hz (at 10 Hz Offset) -91 dBc/Hz (at 10 kHz Offset)
Output Power	>10 mW (FC/APC Connector), High Power on Request
Cavity Spacer	5 cm, ULE, Cubic Design (Developed in Collaboration with the NPL, UK)
Free Spectral Range	3 GHz
Linear Drift Rate	approx. 150 mHz/s
Vibration Isolation Platform	Included
System Dimensions	590 x 800 x 900 mm (16U)
Weight	180 kg

REQUIREMENTS

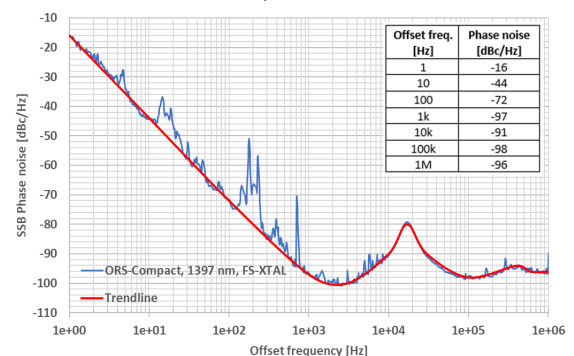
Operating Voltage	100 / 115 / 230 VAC
Line Frequency	50 to 60 Hz
Operating Temperature	22 ± 5 °C
Power Consumption	150 W

STABILITY AND PHASE NOISE

ORS-Compact Fractional Frequency Stability



ORS-Compact Phase Noise



ORDERING INFORMATION

Product Code ORS-Compact

Please call for pricing. Specifications are subject to change without notice. Custom modifications are available, please inquire. The cubic cavity is an NPL patented design that is sold under a licensing agreement with the National Physical Laboratory (NPL). This configuration of the NPL cavity is intended for terrestrial use only. For further information on space-customised or space-qualified cavities, please contact NPL.



Invisible laser radiation
avoid exposure to beam
Class 3b laser



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