

## ULTRASTABLE SINGLE-FREQUENCY LASERS



### MEPHISTO MEPHISTOS PRODUCT LINE

- ▶ Single-frequency cw laser
- ▶ Low noise
- ▶ 1064 nm
- ▶ 1319 nm

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*The art of*  
**SCIENTIFIC LASERS**

# MEPHISTO MEPHISTOS

PRODUCT LINE

## APPLICATIONS

- ▶ Scientific research (optical length and frequency standards)
- ▶ General laboratory source (components testing, optical inspection)
- ▶ Optical heterodyning & communication
- ▶ Nonlinear optics pump source (SHG, DFG, OPO)
- ▶ Injection locking & seeding of high power lasers
- ▶ Laser-based metrology (precision interferometry & spectroscopy, fiber-optic sensing, LIDAR applications)

## GENERAL FEATURES

- ▶ Nonplanar ring geometry for reliable single-frequency operation
- ▶ All solid-state, diode-pumped system
- ▶ Monolithic cavity for ultrastable emission
- ▶ Low noise control electronics
  - Frequency & power modulation inputs
  - Safety circuitry (soft-start, interlock, temperature guard)

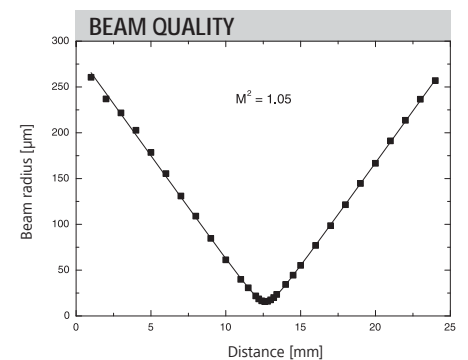
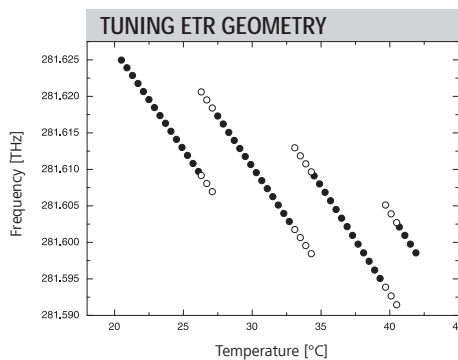
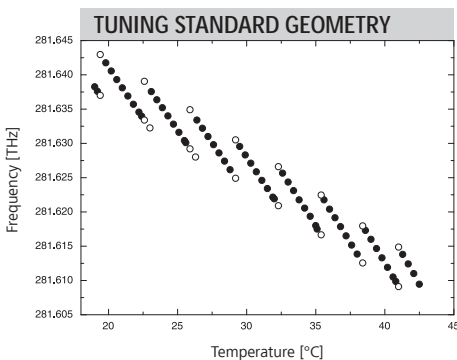
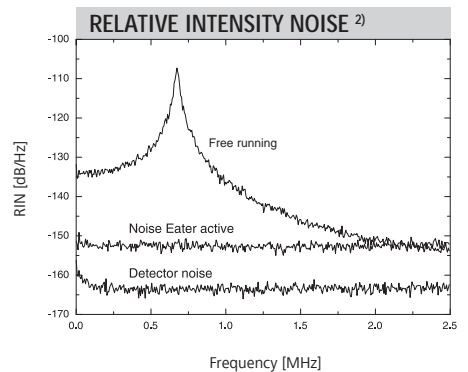
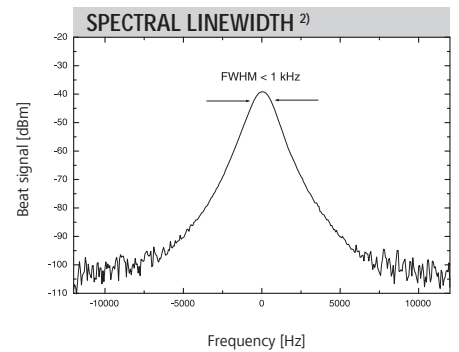
## GENERAL SPECIFICATIONS @ 1064 nm

|  | Mephisto                          | Mephisto S                        |
|--|-----------------------------------|-----------------------------------|
| Operational mode                                   | Continuous wave (cw)              | Continuous wave (cw)              |
| Beam quality                                       | TEM <sub>00</sub> ( $M^2 < 1.1$ ) | TEM <sub>00</sub> ( $M^2 < 1.1$ ) |
| Thermal tuning coefficient [GHz/K]                 | -3                                | -3                                |
| Thermal tuning range [GHz]                         | 30                                | 30                                |
| Thermal response bandwidth [Hz]                    | ≅ 1                               | ≅ 1                               |
| PZT tuning coefficient [MHz/V]                     | ≅ 1                               | ≅ 1                               |
| PZT tuning range [MHz]                             | ±100                              | ±100                              |
| PZT response bandwidth [kHz]                       | 100                               | 100                               |
| Emission spectrum                                  | Single-frequency                  | Single-frequency                  |
| Spectral linewidth [kHz/100 ms]                    | ≅ 1                               | kHz range                         |
| Coherence length [km]                              | > 1                               | > 1                               |
| Frequency stability <sup>1)</sup> [MHz/min]        | ≅ 1                               | ≅ 10                              |
| Relative intensity noise (RIN), f > 10 kHz [dB/Hz] | < -100                            | < -90                             |
| RIN with Noise Eater option, f > 10 kHz [dB/Hz]    | < -140                            | < -120                            |
| Intensity noise, 10 Hz to 2 MHz [% rms]            | < 0.1                             | < 0.5                             |

1) Measured Allan Deviation at constant room temperature

2) Only for Mephisto product line

Specifications for other wavelengths on request.



# MEPHISTO

## PRODUCT LINE

### SPECIFICATIONS

|   |                    |
|---|--------------------|
| Waist location (inside laser head) [mm] | ≅ 105              |
| Laser head size, w · h · d [mm]         | 150 · 113 · 200    |
| Laser head weight [kg]                  | 3.9                |
| Control electronics                     | Details on request |

### MODEL SPECIFICATIONS

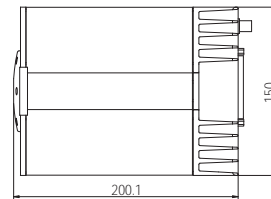
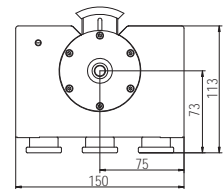
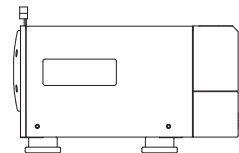
|                                    |  |
|------------------------------------|--|
| Mephisto, power @ 1064 nm [mW]     | 500 <sup>3)-5)</sup> , 1000 <sup>3)-4)</sup> , 2000 <sup>3)-4)</sup> |
| Mephisto MIR, power @ 1319 nm [mW] | 200 <sup>3)-4)</sup> , 500 <sup>3)-4)</sup> , 800 <sup>3)-4)</sup>   |

Options: 3) NE (Noise Eater); 4) FC (Fiber Coupling); 5) ETR (Extended Tuning Range)  
Other laser materials and wavelengths on request, e. g. 1030 nm, 1053 nm, 1444 nm.

### ACCESSORIES

|   |  |
|---|--|
| Fiber coupling                              |  |
| Injection seeding electronics <sup>6)</sup> |  |
| Phase locked loop controller <sup>6)</sup>  |  |

6) Details in separate Laser Accessories data sheet



All numbers in mm

# MEPHISTOS

## PRODUCT LINE

### SPECIFICATIONS

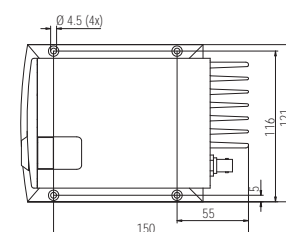
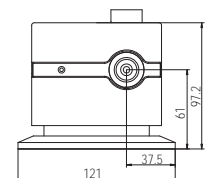
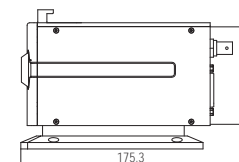
|   |   |
|---|---|
| Mephisto S, power @ 1064 nm [mW]        | 200 <sup>7)-8)</sup> , 500 <sup>7)-8)</sup> |
| Waist location (inside laser head) [mm] | 95  |
| Laser head size, w · h · d [mm]         | 121 · 97 · 175                              |
| Laser head weight [kg]                  | 2.5   |
| Control electronics                     | Details on request                          |

Options: 7) NE (Noise Eater); 8) FC (Fiber Coupling);  
Other wavelengths on request.

### ACCESSORIES

|   |  |
|---|--|
| Fiber coupling                              |  |
| Injection seeding electronics <sup>9)</sup> |  |
| Phase locked loop controller <sup>9)</sup>  |  |

9) Details in separate Laser Accessories data sheet



All numbers in mm



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**LASER APERTURE - AVOID EXPOSURE - Visible and/or invisible laser radiation is emitted from this aperture.**

**DANGER - Visible and/or invisible Laser radiation when open. AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION**

