

LASER FIZEAU INTERFEROMETERS

Measure surface form, mid-spatial frequencies, and transmitted wavefront

System Overview

| | S50 HR [SR] | S100 HR [SR] | S150 HR [SR] |
|--------------------------------------|---|---|---|
| Output Diameter | 51 mm (2 inch) | 102 mm (4 inch) | 153 mm (6 inch) |
| Optical Centerline from table | 108 mm (4.25 inch) | 108 mm (4.25 inch) | 133 mm (5.24 inch) |
| Focus Range | ±2 meters | ±2 meters | ±4.5 meters |
| Size (L x W x H) | 63 x 29 x 18 cm (24.8 x 11.4 x 7 inch) | 70 x 32 x 25 cm (27.6 x 12.6 x 9.8 inch) | 90.2 x 40.8 x 23.9 cm (35.5 x 16.1 x 9.4 inch) |
| Weight | 25 kg (55 lbs) | 33 kg (73 lbs) | 50 kg (110 lbs) |

| | |
|----------------------------------|---|
| Measurement Techniques | Traditional Phase-shifting, Vibration Tolerant Phase-shifting AND Vibration Insensitive Carrier Fringe (Wavelength Shifting option available) – SCI Ready |
| Alignment System | 2-spot with reticle with 2° capture range |
| Laser Source | Frequency Stabilized, SLM 633 nm HeNe (multiple power and λ options) |
| Laser Frequency Stability | <0.0001 nm |
| Coherence Length | >100 m |
| Output Polarization | Circular |
| Camera Resolution | 2044 X 2044 pixels [1024 X 1024 pixels] |
| Shutter Speed – shortest | 9 μ s |
| Digitization | 12 bits |
| Computer & Software | High-Performance PC, running any Windows® 64-bit OS, and REVEAL software |
| Mounting Configurations | Horizontal or Vertical |
| Accessories | Industry standard bayonet |

Performance

| | | | |
|--|--|---------------------------|---------------------------|
| Image Resolution (Detector Limited) | 50 μ m [100 μ m] | 100 μ m [200 μ m] | 150 μ m [300 μ m] |
| Image Distortion | <0.1% over entire focusing range | | |
| Image Field Flatness | <30 μ m (worst case) @ 2 meters part distance | | |
| Fringe Resolution | Carrier Fringe: 500 [250] fringes/aperture PSI & VTPSI : 650 [325] fringes/aperture | | |
| Retrace Error @ 500 [250] Fringes¹ | < $\lambda/20$ | | |
| RMS Simple Repeatability² | <0.5 nm RMS 2σ – with NO averaging | | |
| RMS Wavefront Repeatability³ | <0.5 nm RMS 2σ – with NO averaging | | |
| Measurable Part Reflectivity | 0.5% to 40% (direct) and 41% to 100% (with attenuation filter or coatings) | | |

Environment

| | |
|---------------------------------------|--|
| Temperature | 15 °C to 30 °C (59 °F to 86 °F) |
| $\Delta T/\Delta t$ | <1.0 °C/15 min |
| Humidity | 5 to 95% relative, non-condensing |
| Vibration Isolation | Isolation System recommended for PSI & VTPSI |

¹ Retrace Error is defined as the residual error between a no tilt fringe (null) measurement (the reference), subtracted from a measurement with maximum fringes of tilt, with only the first 36 Zernike polynomials reported

² RMS Simple Repeatability is defined as 2X the standard deviation of the RMS for 36 sequential measurements (0 averages) of a short plano cavity

³ RMS Wavefront Repeatability is defined as the mean RMS difference between a synthetic reference (defined as the average of all 36 sequential measurements) and each measurement plus 2X the standard deviation