OPTOCRAFT
OPTICAL METROLOGY

SHSInspect RL GAUGE

The SHSInspect RL GAUGE is a versatile wavefront measurement tool for quick and easy optics alignment or for basic testing of optics. It unites SHSLab wavefront sensor and light source in a single, compact device and can be easily integrated into table top set-ups, testing platforms or production lines.

Benefits:

- Modular illumination unit for easy wavelength change
- Wavefront sensor can be used separately
- Null lenses for sample illumination with spherical wave

SHSInspect RL GAUGE	
Optical System	
Operation wavelength	VIS (400nm-700nm) or NIR (700nm-1050nm)
Exit pupil diameter	Depending on SHSCam model used with the module, see below
Acceptance angle (light on detector)	+/- 7°
Acceptance angle (Quantitative evaluation of wavefront tilt)	+/- 3.5°
Optical path from front flange to micro lens array (at 530nm)	105mm (No pupil conjugation, SHSInspect RL GAUGE does not include relay optics)
Internal imaging with iris stop	No

Mechanical Properties of RL GAUGE without SHSLab and additional optics	
Dimensions (LxWxH)	103 x 232 x 70 mm³
Weight	2 kg

SHSLab (quoted separately, see separate data sheets for further information)				
	HR2-130-GE	HR3-075-GE	SHR4-075-GE	UHR3-075-GE
Lateral resolution	85 x 53	111 x 93	137 x 137	203 x 203
Evaluation rate (typ.) / Hz	18	10	6	4
Pupil diameter / mm	7	7	10.3	15.2

Performance of the RL GAUGE with SHSLab	
Measurement accuracy	Depends on application and sample aberrations, see remark below*
Typ. repeatability[1]	2nm rms

Included Accessories	
Cat's eye module	Tilt calibration unit

Optional Accessories	
Null lenses	Microscope objectives with different NA available (up to NA=0.8)
Beam expander	For adaption of the diameter of the collimated out-put beam
Beam expander support	Mechanical support to stabilize beam expander in front of the module
Light sources	LEDs with quick-change collimation unit for easy change of light source
Calibration flats	For optics with large diameter
Reference spheres	For double pass measurement of optics and for calibration of objectives
Workstation PC	Notebook or desktop PC, pre-configured and tested
Zemax Model	Simulation model containing black boxes

Customization of the RL GAUGE is possible upon request:

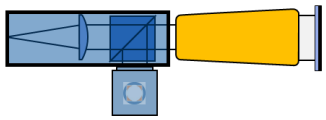
- Other operation wavelength range (UV / SWIR)
- Other light sources (lasers, laser diodes)
- Other null lenses

*Remark on measurement accuracy:
Due to the lack of an internal relay optics the wavefront will propagate from the entrance of the module to the wavefront sensor by a distance of min. 105mm. For example, a sample that introduces wave aberrations of ca. 1 wave PV this propagation effect will cause a measurement error of about 5%. Typically, for samples with lower aberrations, the error will be smaller; for samples with stronger aberrations, the error will be higher. See also separate AppNote in which this topic is discussed in detail.

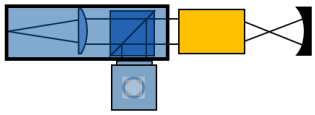
[1] The repeatability depends on the selection of the wavefront sensor model and is the difference between two successive wavefront measurements.

Typical double pass configurations

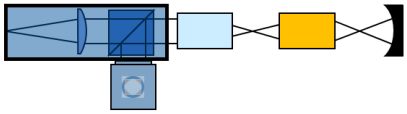
Infinite-infinite
Plano measurement beam
Reference flat
Afocal systems



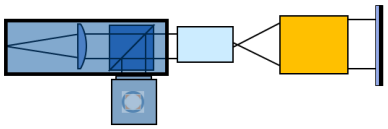
Finite-infinite 1
Plano measurement beam
Reference sphere
Lenses, sub-systems



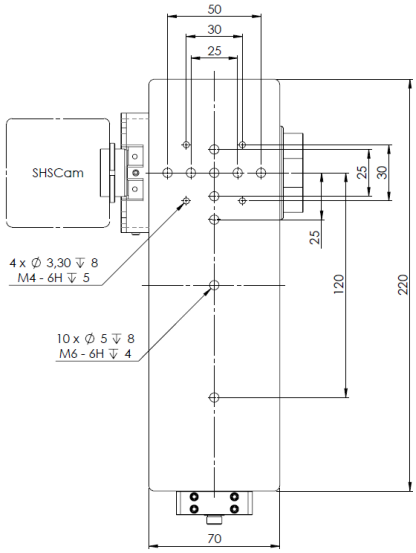
Finite-finite
Spherical measurement beam
Reference sphere
Lenses, sub-systems



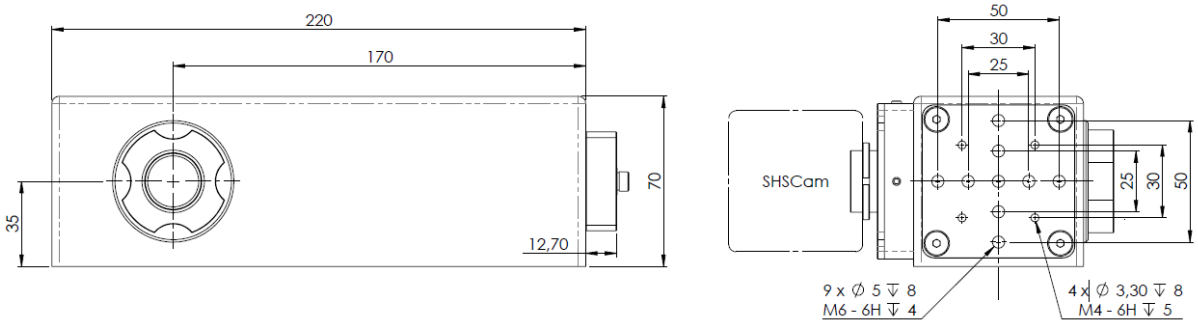
Finite-infinite 2
Spherical measurement beam
Reference flat
Lenses, sub-systems



Drawings



Base plate of the module and position of threaded holes.



Side- and top-view of the SHSInspect RL GAUGE, optical axis is indicated (SHSCam shown only schematically)