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Free-space microscopes for inVia

Free-space microscopes

One of the key advantages of Raman spectroscopy is the very wide variety of samples that may be successfully analysed.

When samples or accessories are too large to fit under the standard microscope, a large open-frame microscope ensures routine examination is still possible. Solar panels, larger semiconductor wafers and cryostats (for low temperature measurements) can be analysed with ease using Renishaw's free-space microscope (FSM). These are available with a range of focus and motorised stage options.

Two frame sizes

Free-space microscopes are available in two frame sizes:

- **free-space microscope** (samples up to 370 mm wide)
- **wide free-space microscope** (samples up to 700 mm wide)

These can be configured—at the time of ordering—from a range of options, enabling you to match the microscope to your requirements.

Renishaw's free-space microscopes are large open-frame microscopes designed specifically for the routine analysis of samples too large to fit under the standard inVia microscope.

inVia Reflex with free-space microscope, configured with 4" travel motorised stage (H101A), motorised sample focusing, and fixed focus nosepiece/ objective. See back page for specifications.

Analyse tall and heavy samples

With two options for sample focussing, the free-space microscope can accommodate taller and heavier samples:

- **Nosepiece focus**
  This keeps the height of the sample stage fixed and moves the microscope nosepiece and objective lens vertically
- **Stage focus**
  This keeps the nosepiece and objective fixed and moves the sample stage vertically.

Both options can be motorised, and have a manual coarse height adjustment, enabling the accommodation of a wider range of sample thicknesses.

Stability ensures reliable results

For stability, free-space microscopes must be mounted on an optical table. Please tell us your requirements and we will help you determine the most appropriate size of table for your application.

Typical applications

There are many uses of inVia free-space microscopes, including:

- semiconductor wafers
- photovoltaic panels
- paintings and other large works of art
- helium cryostats for low temperature Raman and photoluminescence measurements
- Raman combined with beam line techniques (such as x-ray diffraction)
- geological samples
- high pressure studies

Custom solutions

Our special products team has extensive experience in the development of custom solutions, such as dual microscope configurations, inverted microscopes, and systems with larger motorised stages. They will be happy to discuss your specific requirements.

inVia Reflex with wide free-space microscope, configured with 10" travel motorised stage (H116) and focusing nosepiece/ objective.

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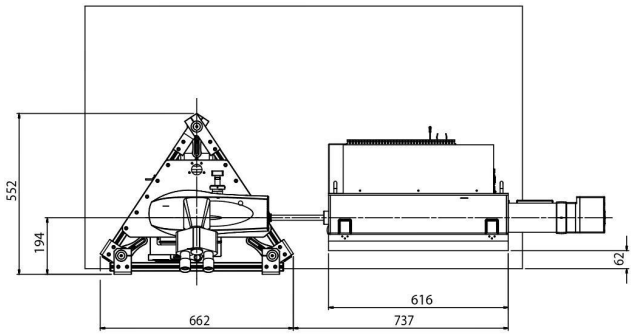
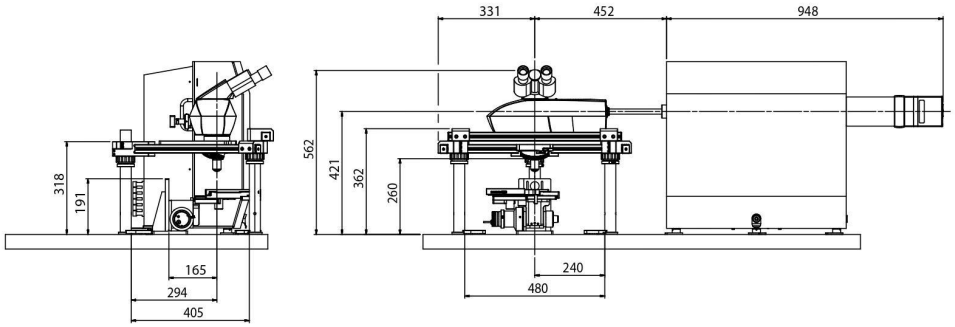
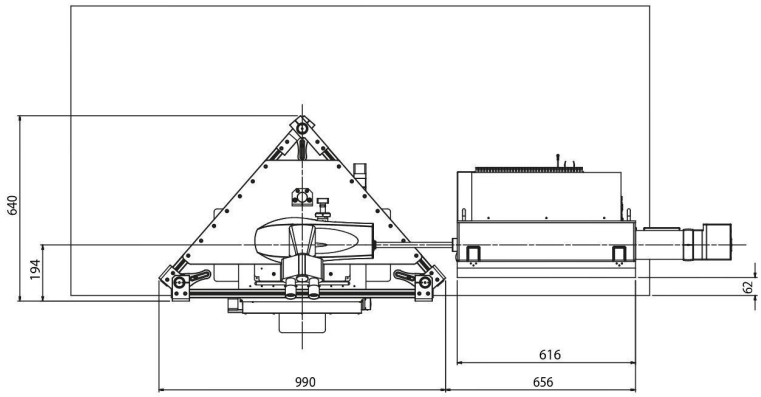
Example configurations

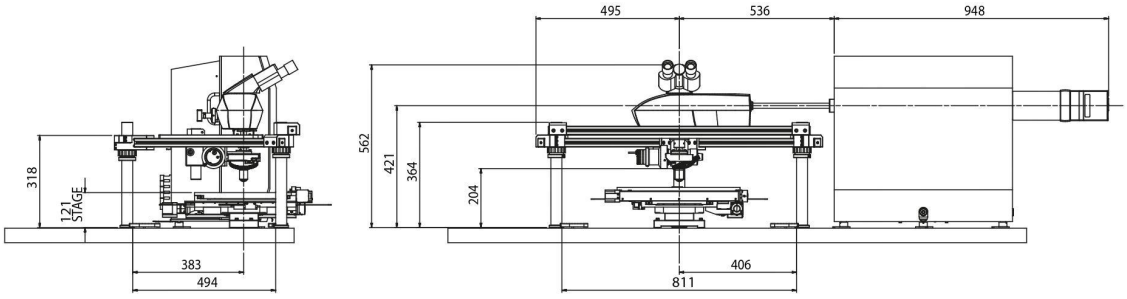
inVia Reflex with free-space microscope, configured with a 4" travel motorised stage (HSES) (with focus movement) and fixed nosepiece/objective. All dimensions in mm.





inVia Reflex with wide free-space microscope, configured with a 12" travel motorised stage (H112) and focusing nosepiece/objective. Objective turret set at highest position. All dimensions in mm.





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Free-space microscope options and specifications

Width	Stage	Focus method	Sample x_{max}	Sample y_{max}	x_{travel}	y_{travel}	z_{max}	z_{travel}	m_{max}
FSM	HSES	Stage	475 mm	583 mm	112 mm (4.41")	76 mm (2.99")	68 mm	29 mm	2 kg
		Nose							
	H101A	Stage			114 mm (4.48")	75 mm (4.48")	68 mm	29 mm	1.5 kg
		Nose							
	H105	Nose	475 mm	583 mm	154 mm (6")	154 mm (6")	79 mm	29 mm	20 kg
Wide FSM	H112	Nose	806 mm	761 mm	300 mm (12")	300 mm (12")	36 mm	29 mm	25 kg
	H116	Nose	806 mm	761 mm	256 mm (10.1")	215 mm (8.46")	29 mm	29 mm	25 kg

Notes

1. Unshaded columns indicate options to be selected prior to build. For example, the FSM is available with either an HSES stage or an H101A stage, for either nosepiece or stage focusing; each is available as manual or motorised movement.
2. Shaded columns indicate specifications.
3. Focus method for z can be manual or motorised.
4. x_{max} is the maximum sample width (i.e. left-to-right) that can be accommodated.
5. y_{max} is the maximum sample depth (i.e. front-to-back) that can be accommodated.
6. Stage column: Renishaw HSES (“MS20”, “CXY”), Prior H101A, Prior H105, Prior H116, Prior H112. Further details on the specifications of these can be found in the following documents:

   MS20: Data sheets DS001 and DS003

   Prior stages: http://www.prior-scientific.co.uk/Products/Motorized-Stages/
7. x_{travel} and y_{travel} are the maximum movements of the stage left-right and front-back respectively.
8. z_{space} is the maximum height of sample that can be accommodated when using a 45 mm parfocal distance objective.
9. z_{max} is the maximum sample fine focus travel.
10. m_{max} is the maximum mass of sample that can be supported on the stage.

- Class 3B laser product in standard configurations
- Optional Class 1 laser safe enclosure
- Deep UV use requires Class 4 laser safety precautions
- Fully enclosed laser paths for multiple lasers
- Fully interlocked with interlock self-test features

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