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Measuring surface roughness with SP25M scanning probe and SM25-5Y module

The SM25-5Y module is a skidless stylus module that can measure surface roughness with a high resolution and accuracy

Surface roughness is a measure of the micro-geometry of a surface, which affects its friction, wear, and reflectivity. Measuring surface roughness is important for quality control and inspection of various products and materials. The SP25M scanning probe is a versatile and flexible device that can measure surface form, as well as size and position of features, with different modules and styli. The SM25-5Y module is the latest addition to the SP25M module range, and it is specially designed for surface roughness measurement.

Features

Spring force

A light spring force in the module's Y-axis and fixed in the X-axis to make it more responsive to variations in surface roughness rather than surface form. A high spring rate in the module's Z-axis offers crash protection and compliance for tool changing.

Styli

A lightweight tri-lobed stylus design that incorporates a 5 µm radius diamond tip to minimise the stylus / workpiece contact force.

A tapered stylus that optimises workpiece access and avoids interference with adjacent features.

Compatibility

Probe	Fully compatible with the SP25M scanning probe and multiwired extension bars
Probe head	Renishaw multiwired probe heads - PH10M PLUS, PH10MQ PLUS, PH10M-iQ PLUS, PH6M
Automated changing	FCR25 module change racks (modules must be orientated vertically)

NOTE: The SM25-5Y module is currently available as a 'special' product and may be subject to an extended lead-time.

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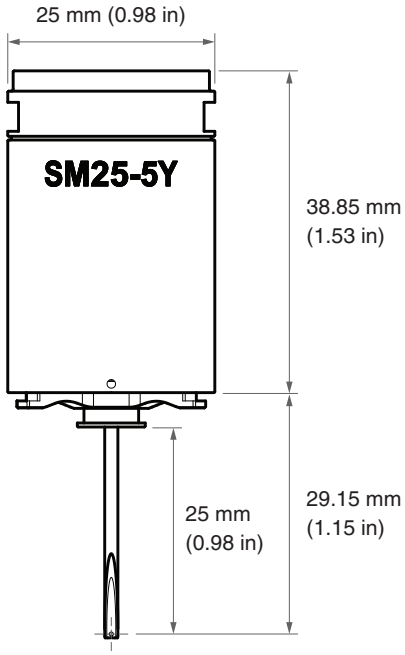
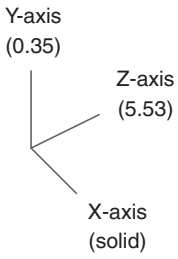
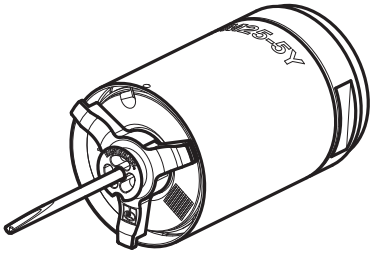
Specification

	X-axis	Y-axis	Z-axis
Spring rate (N/mm) SM25-5Y	Solid	0.35	5.53
Recommended module measurement range (mm)	Fixed	±0.03	n/a
Total module measurement range (mm)	Fixed	±0.95 (~0.3 droop with stylus attached)	±1.1 (~0.03 droop with stylus attached)
Moving mass (g)	-	7.9	13
Module mass (g)	45		
Stylus mass (g)	1.85		
Diamond stylus radius (µm)	5		
Stylus tip angle	90°		
Typical surface finish accuracy (of nominal Ra)*	±(10% + 30 nm)		
Recommended scan speed (mm/s)	≤0.3		
Machine cabling	Requires standard multiwire cabling from probe head to controller.		
Integration requirements	SM25-5Y outputs are consistent with standard P, Q, R outputs from SM25 modules. Calibration of the module, to define its linear behaviour, is derived in the same way as other SM25 modules, using the Renishaw SP25M calibration dll.		

* Accuracy values are dependent upon a number of system variables. These include the machine size and configuration, scan orientation, condition of stylus tip, part fixturing system and environmental noise.







	Part number
SM25-5Y module	A-6866-0201
SH25-SF stylus	A-6866-0634
Module and stylus kit	A-6866-0202

www.renishaw.com/SP25M

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Part no.: H-1000-2145-01-A
Issued: 05.2024