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SP600Q in-quill scanning probe

A compact, in quill scanning probe

The SP600Q is a highly robust, in-quill analogue probe which is ideal for scanning and point measurement on CMMs. Compact in size, the SP600Q mounts directly onto the quill of the CMM. Along with minimal intrusion into the working volume, the SP600Q provides a cost-effective scanning option to CMM users with small machines.

The SP600Q allows large amounts of data to be rapidly gathered for inspection and digitising purposes. Measurement range in each direction (x, y and z) is ±1mm (±0.04 in) and stylus lengths up to 300 mm (11.81 in) can be used with the SH600 EXT stylus holder.

Kinematic stylus holders provide overtravel protection, and allow rapid and repeatable interchange between stylus configurations. This can be automated by using the SCR600 stylus change rack, or alternatively, individual SCP600 stylus change ports mounted to an MRS.



Key benefits

Maximise working volume
The SP600Q scanning probe is quill-mounted to maximise your working volume.

Repeatable stylus changing
Fast, automatic interchange between stylus configurations permits the best solution for the application and increases productivity.

Low cost of ownership
Excellent product life with a MTBF in excess of 50,000 hours.

Excellent dynamic performance
The SP600Q's low mass, high structural stiffness and friction-free viscous damping give excellent dynamic performance characteristics.

Innovations

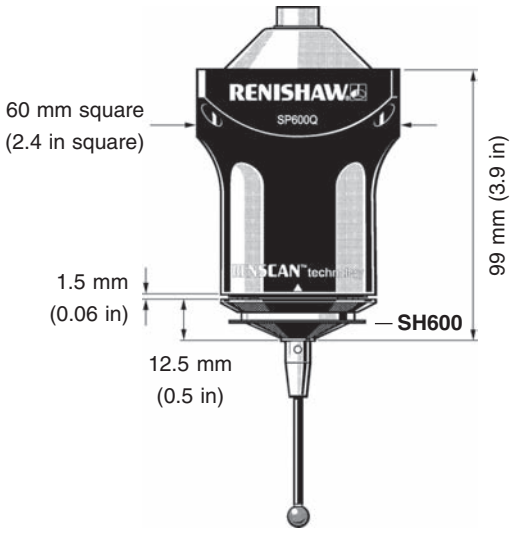
Isolated optical metrology
SP600Q directly measures the deflection of the whole mechanism, thus providing outstandingly accurate position sensing. The isolated optical metrology system can detect sources of variable error such as thermal and dynamic effects. By contrast, probes with displacement sensors mounted to stacked axes suffer from increased dynamic latency. This is due to the requirement of any stylus deflection to move a greater mass before transduction in all 3 axes has taken place.

Isolated optical metrology can be explained as a feature of the transducer system. The readheads for each axis are fixed to the body of the probe, and measure the deflection in each direction. Any inter-axis movement caused by the arc motion of each pair of parallel-acting springs are directly measured by the sensor system.

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Specification

Principle application		High speed, contact form scanning and fast point measurement system
Probe attributes		3 axis measurement X, Y, Z
		Linear and parallel motion in all axes
Measurement range		±1 mm (±0.04 in) X, Y, Z
Overtravel range		±X, ±Y and -Z are protected by a kinematic break out joint on the SH600
		+Z is protected by a bump-stop design
Resolution		0.1 µm (0.000004 in) with optional AC2 interface card
		1.0 µm (0.00004 in) with optional AC1 interface card
Spring rate		1.2 N/mm (7.05 ozf) nominal (X, Y, Z)
Styli	**Thread**	M4 standard range
	Length	200 mm (7.87 in) maximum using SH600 STD
		300 mm (11.8 in) maximum using SH600 EXT
	Mass	20 g (0.7 oz) maximum
Power supply		+12 V to –12 V, 5 V (±10%)
Outputs (X, Y, Z)		Analogue proportional
Weight		299 g (10.5 oz)
Mounting		Direct quill mounting to the CMM
Suitable interface		AC1 or AC2 interface cards (ISA bus)
Change rack system		SCR600 four port change rack
		SCP600 single port unit(s) mounted to MRS



Additional information

Other variants of the SP600Q include SP600 and the SP600M. The SP600 allows simple fixed mounting via a Renishaw shank. The SP600M is mounted via an autojoint and can be orientated using Renishaw's PH10M or PH10MQ motorised probe heads.

For further details on this and other related products, please see www.renishaw.com/SP600Q.



SCR600 change rack

For worldwide contact details, please visit our main website at www.renishaw.com/contact

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Experience accuracy, speed and incredible performance with the SP600 system

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Enhance the performance of your CMM with an SP600 scanning probe system



RENSCAN™ technology
Rapid scanning measurement and digitising

Low cost of ownership – exceptionally long product life

Now able to carry 300 mm styli

Enhance the performance of your CMMs with an enhanced SP600 system

Experience accuracy, speed and incredible performance with the SP600 system



High performance

The SP600 range of analogue sensing probes offers high-performance inspection, digitising and profile scanning capability for a wide range of CMMs.

Renishaw's SP600 probes enable large amounts of part measurement data to be rapidly collected for inspection or scanning applications. They are suitable for a wide range of industrial uses such as gear inspection, sheet metal profile measurement and form measurement. The probes are also particularly suited to fine detail scanning.



Complete and versatile system

The SP600 analogue scanning system includes the SP600 scanning probe, a PC interface card and a stylus changing rack. Together, they offer a flexible system capable of meeting most of the demands of today's CMMs.

Reliable and robust

The SP600 has been designed with a low number of electronic components and mechanical moving parts to ensure excellent life expectancy.

The SP600 can also withstand minor impact with in-built crash protection in the XY axes, via the detachable stylus holder. During a Z axis crash, the impact is transferred from the sensing mechanism as the stylus holder is pressed onto the body of the probe.

These innovative design aspects ensure the cost savings associated with long product life.

Ideal probe to suit your CMM

SP600 probes are available in three versions:

- **autojoint mounted SP600M**
- **in-quill SP600Q**
- **shank mounted SP600**

Each of them has been designed to respond to specific application challenges without compromising performance features.

Benefits include:

- **High speed scanning up to 300 mm/s, fast point measurement and high frequency response**
- **Low probing forces for maximum application flexibility**
- **Extremely robust design to withstand moderate collisions**
- **Fast stylus module changing saving time and increasing productivity**
- **Low cost of ownership with an excellent product life, exceeding 50,000 hours in operation**

The SP600 probe system

The SP600 comprises a probe body and a detachable stylus holder. The probe body contains an extremely robust parallel operating sensor mechanism. Stylus holders such as the new SH600-EXT are connected to the probe body using a kinematic mount, which provides repeatable positioning, and avoids the need for re-qualifying different stylus arrangements.

Automatic stylus changing can be carried out using either the SCR600 stylus holder change rack or the SCP600 stylus holder change port mounted on an MRS modular rack system.

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Superior component access and RENSCAN™ technology



Renishaw continually develops new and improved products to ensure that our range of solutions meets your growing inspection needs.

The latest feature added to the SP600 probes is the ability to carry styli up to 300 mm (12 in) in length with the new SH600-EXT stylus holder.

SP600M

The SP600M probe incorporates Renishaw's patented autojoint, allowing connection to either a PH6M manual probe head, or the PH10M range of motorised heads which enable the probe to be orientated automatically. The orientation capability gives the added benefit of repeatable indexing without re-qualification. Indexing is clearly faster than stylus changing, and minimises working volume otherwise lost due to stylus change racks needed to store large star styli or multiple styli clusters.

The autojoint is a highly repeatable kinematic design which enables different probes to be mounted to a probe head. It eliminates the need for probe re-qualification after exchange.

Locking and unlocking the autojoint is carried out either manually using a special autojoint key, or automatically, using the Renishaw Autochange Rack system.



SP600Q

Designed to be mounted to the quill of the CMM, and with an overall length of only 98 mm, the compact SP600Q analogue scanning probe maximises the working volume for users of small machines. It offers improved probe performance through increased rigidity. The SP600Q features in-quill cabling, for a fast and neat installation. A shank mounted version, simply named the SP600 is also available. As with the SP600M, the SP600 and SP600Q are compatible with the SH600-EXT, allowing scanning with styli of up to 300 mm.

RENSCAN™ technology

Renishaw invented the world's first touch trigger probe in 1974 to solve a specific inspection requirement, and went on to revolutionise the use of CMMs. Since then, the company has relentlessly developed innovative products to fulfil the increasing demands placed on quality inspection. This concept is the focal point of RENSCAN™ technology, Renishaw's integrated scanning philosophy.

RENSCAN™ technology provides class-leading scanning performance, with a modular approach to design, which allows greater flexibility and lower lifetime costs than conventional fixed scanning systems.

RENSCAN™ technology is based on the following principles:

- **compact, light and robust scanning sensors** which support high speed, high accuracy measurement
- improved accuracy, accessibility and flexibility obtained from **probe and stylus changing**
- maximum inspection system performance due to high integration of sensor and **machine control**, with sophisticated **dynamics compensation**
- **isolated optical metrology** that measures probe deflections independently

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Renishaw applies innovation to provide solutions to your problems

Renishaw is an established world leader in metrology, providing high performance, cost-effective solutions for measurement and increased productivity.
A worldwide network of subsidiary companies and distributors provides exceptional service and support for its customers.

Renishaw designs, develops and manufactures products which conform to ISO 9001 standards.

Renishaw provides innovative solutions using the following products:

- **Probe systems for inspection on CMMs (co-ordinate measuring machines).**
- **Systems for job set-up, tool setting and inspection on machine tools.**
- **Scanning and digitising systems.**
- **Laser and automated ballbar systems for performance measurement and calibration of machines.**
- **Encoder systems for high accuracy position feedback.**
- **Spectroscopy systems for non-destructive material analysis in laboratory and process environments.**
- **Styli for inspection and tool setting probes.**
- **Customised solutions for your applications.**

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