Probing systems for co-ordinate measuring machines

- **REVO**
  - 5-axis multi-sensor scanning system

- **PH20**
  - 5-axis touch trigger system

- **PH10**
  - Motorised indexing probe head

- **RTP20**
  - Half-auto indexing probe head

- **MH20i**
  - Manual indexing probe head

- **MCP**
  - Fixed probe head

For more detail information, see [www.renishaw.com](http://www.renishaw.com)
MCP Kit Data Sheet.


- Suitable interface: Standard touch trigger interface e.g. PI4-2
- Sensor Directions: ±X, ±Y, +Z
- Unidirectional Repeatability: 0.75 μm
- Pretravel variation (XY plane): ±1.5 μm
- Trigger force (fixed): 12 g
- Stylus mount: M3
- Probe status: LED
- Probe signal connection: 5 pin Din
- Overtravel protection: Z 5 mm  XY ±20 degrees

MCP Manual Probe (A-1311-0096)
PL1T cable (A-1016-0004)
M3 Φ1x21mm Stainless Steel Stylus (A-5000-3551)
M3 Φ2x21mm Stainless Steel Stylus (A-5000-3552)
M3 Φ3x21mm Stainless Steel Stylus (A-5000-3553)

Detail information see  www.renishaw.com
MH20i indexing probe head
Probing systems for coordinate measuring machines

Fatal information see www.renishaw.com
RTP20 indexing probe head
Probing systems for coordinate measuring machines

RTP20 features and benefits:

• Improved productivity is achieved via probe module changing and automated indexing, without the need for constant requalification.

• A built-in extension together with existing extension bars allow reach up to 168 mm (including maximum stylus length).

• Utilising the CMM motion to lock, unlock and orientate the head, together with the MCR20, provides a fully automated system.

• TP20 modules have overtravel in all directions. The magnetic mounting provides additional crash protection in X and Y.

Detail information see www.renishaw.com
**PH10T indexing probe head**
Probing systems for coordinate measuring machines

**PH10T motorised indexing probe head**

The PH10T is a motorised indexing head that mounts and re-orientates the probe. The PH10T can be repeatably orientated to any one of 720 positions.

All M8 thread probes can be fitted directly onto the mount of the PH10T. The PH10T is operated by the PHC10-2 and is compatible with other Renishaw M8 threaded products.

The AM1 adjustment module permits the correction of the alignment of the probe head to the machine and is fitted between the head and the shank.

**PH10T features and benefits:**

- Compatible with M8 thread probes
- Compatible with PEL range of extension bars up to 300 mm (11.81 in) long
- 720 repeatable positions at 7.5° increments
- Shank-mounted

Detail information see www.renishaw.com
**PH10M & PH10MQ motorised indexing probe heads**

Probing systems for coordinate measuring machines

- The PH10M and PH10MQ are versatile motorised indexing heads that incorporate the Renishaw autojoint with multiwire capability.
- This allows PH10M/MQ heads to carry long extension bars and sophisticated multiwired probes such as SP25M and TP7M. There are 720 repeatable positions, set at 7.5° increments to provide probe orientation.
- The highly repeatable, kinematic autojoint allows rapid probe or extension bar changing without the need for requalification.
- The PH10MQ is a variant that allows the motorised head to be attached directly to the quill with the 'cube' of the head inside the quill itself. This option provides a neater and shorter probe mount, with only the swivel protruding from the quill.
- The AM1 and AM2 adjustment modules permit correction of alignment of the probe head to machine and are fitted between the probe head and the shank/quill of the machine.

*The AM1 and AM2 adjustment modules are required when using a PH10MQ with a PEM25 extension bar to achieve A = 97.5° or A = 105° in all B axis positions.*

Details information see www.renishaw.com
Probing systems for coordinate measuring machines

TP20 modular probes
The TP20 is a 5-way or 6-way kinematic touch trigger probe. Its two piece design comprises a probe body and detachable stylus module(s), which gives the ability to change stylus configurations either manually or automatically without re-qualification of the stylus tips, providing significant time savings in inspection routines. A direct replacement for the industry standard Renishaw TP2 probe, the TP20 probe system brings a range of new benefits to manual and DCC CMM applications, and can easily be retrofitted to existing TP2 installations.

The TP20 can be used on a wide range of Renishaw’s manual or motorised probe heads, either by direct mounting using the standard M8 thread or, alternatively, by using a PAA# adaptor to connect to an autojoint.

SP25M features and benefits:
• The world’s most compact and versatile scanning probe system
• Two sensors in one - a scanning probe, and a touch-trigger probe using TP20 stylus modules
• Rapid and repeatable interchange between highly modular system elements provides the most efficient solution to suit the measurement task
• Excellent scanning accuracy across the entire stylus range of 20 mm to 400 mm (0.79 in to 15.75 in)
• Can be used with extension bars up to 100 mm for even greater reach
• Probe can be mounted on an articulating head, allowing access to many features with fewer styli
• Ultra-compact at Ø25 mm (Ø0.98 in) for superior part accessibility
• Isolated optical metrology technology gives unrivalled measurement performance, even with long styli
• Flexible change rack where ports can be easily configured to carry any system element
• Bump-stop crash protection in the Z axis, together with a detachable stylus holder for XY crash protection
• Low-cost, entry level kits available with ability to easily expand the system

Detail information see www.renishaw.com
5-axis measurement technology

What is 5-axis measurement?

- Based on advanced head, sensor and control technology, Renishaw’s 5-axis measurement technology delivers unprecedented measuring speed and flexibility, whilst avoiding the speed versus accuracy compromises inherent to conventional techniques. It boosts measurement throughput, minimises lead times and gives manufacturers a more comprehensive appreciation of the quality of their products.

- Unlike systems based around indexing heads or fixed probes, 5-axis motion enables the stylus to follow a continuous path around complex components without having to leave the surface to change stylus cluster or index the head. Controller algorithms that synchronise CMM and head motion produce an optimal tip path and minimise CMM dynamic errors.

**PH20 = 5 axis** touch trigger probe head

**Unique and excellent characteristics**

- Enhance efficiency
- Faster calibration
- Increased measuring accuracy
- Limitless angles and positions
- Reduced measuring errors in mechanical motion

Detail information see: www.renishaw.com
REVO
5-axis multi-sensor scanning system

Cylinder head 690% improvement in throughput
Valve seat and guide measurement is one of the toughest measurement tasks in an automotive cylinder block. Using a helical scan, the REVO® head gathers thousands of data points from which the height, diameter, seat width and form can be determined.

The measurements
- 12 valve seats
- 12 valve guides
Before
- 3-axis scanning at 15 mm/sec measurement time = 29 min 13 sec
After
- REVO® at 400 mm/sec and 50 mm/sec² measurement time = 3 min 42 sec
690% throughput increase

Aero engine blisk 922% improvement in throughput
Bladed discs (known as ‘blisks’) present extreme access challenges and conventionally require numerous head indexes. Renishaw’s 5-axis measurement dramatically reduces cycle times through continuous scanning of blade sections, blade surfaces and root profiles.

The measurements
- 9 sectional scans, 8 longitudinal scans and 2 root profile scans per blade
- 1 scan of annulus profile
Before
- 3-axis scanning at 10 mm/sec measurement time; 1 blade = 46 min, all 29 blades = 22 hours 11 min
After
- REVO® at 200 mm/sec measurement time; 1 blade = 4 min 30 sec, all 29 blades = 2 hours 10.5 min
922% throughput increase

REVO™ features and benefits:
- Incorporates Renscan™ five axis scanning technology minimising CMM motion and the associated CMM dynamic errors
- Increased measuring speed, up to 500 mm/sec resulting in increased measurement throughput
- Data collection rates up to 6,000 points per second
- Infinite positioning and five axis motion reduces nonproductive transitions between features
- Stylus wear minimised by extremely low scanning forces
- Infinite positioning and five axis motion aid access to difficult features
- Rapid calibration with all positions inferred means more time measuring
- Maximum reach up to 500 mm with maintained effective working length
- Standard M2 styli for convenience
- Probe and stylus changing capability allowing flexibility and future probing technology compatibility

Detail information see www.renishaw.com