Renishaw probing systems for coordinate measuring machines

Price

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

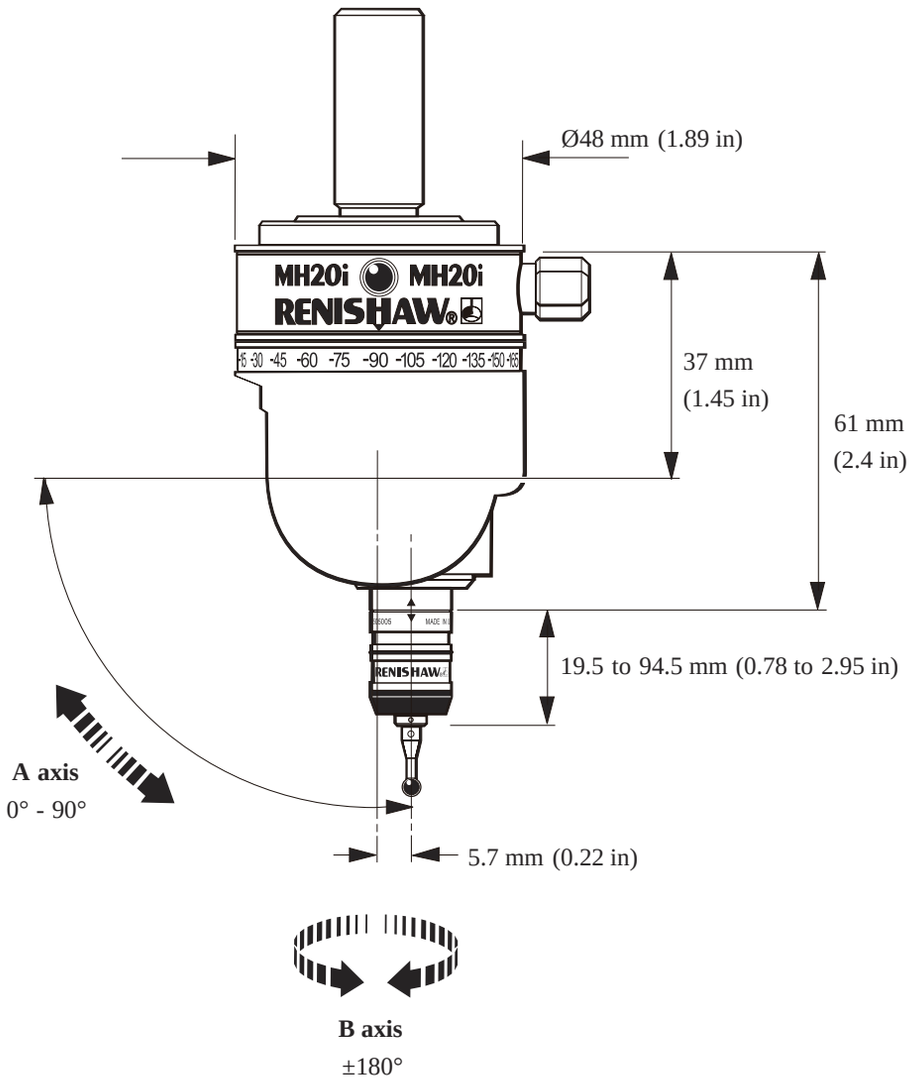
MCP
Fixed probe head

Function

Detail information see www.renishaw.com

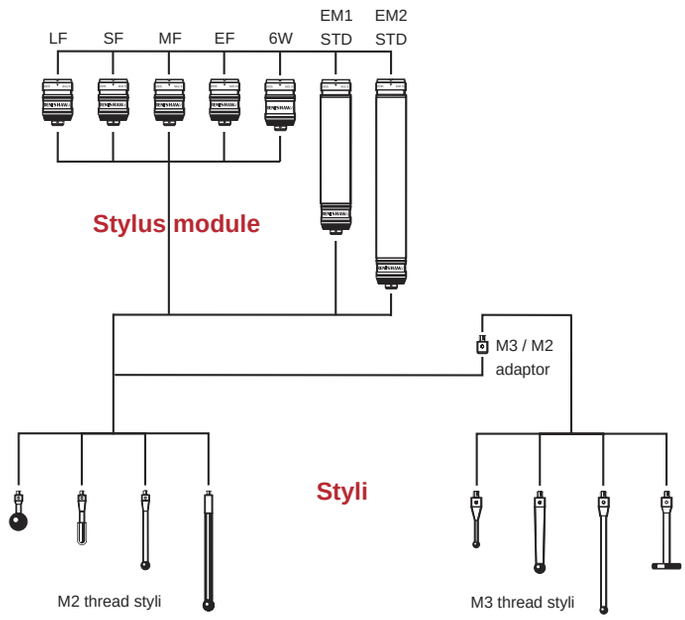
MH20i indexing probe head

Probing systems for coordinate measuring machines



MH20i features and benefits:

- Enhanced inspection capability from adjustable probe orientation with 168 repeatable index positions set at 15° increments
- Repeatable TP20 stylus module changing in each pre-qualified position without the need for re-qualification significantly enhances productivity
- TP20 compatibility, providing a wide range of force and length options to optimise machine performance and access capability
- Easy-to-read scales allow rapid re-orientation
- Position repeatability:
  1.5µm (TP20SF) 2.5µm (TP20EM2)



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RTP20 indexing probe head

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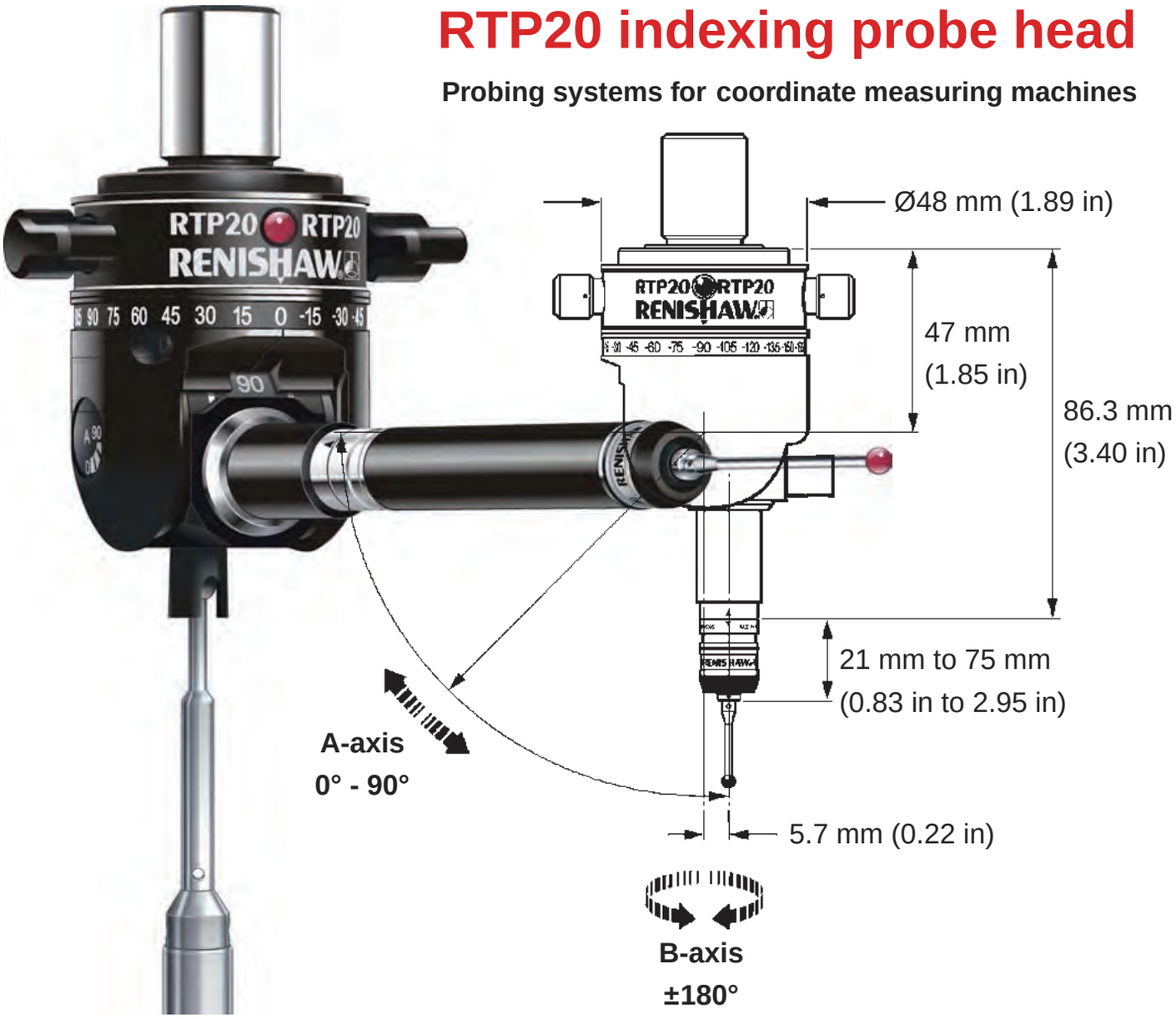
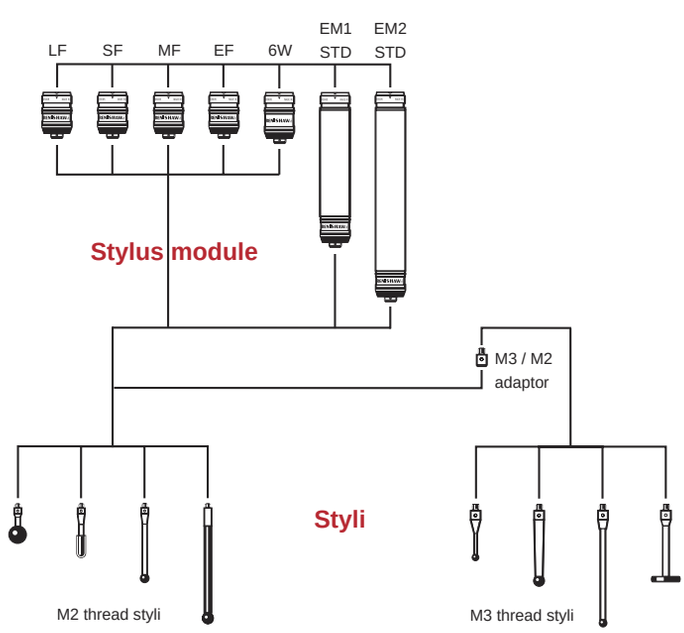


RTP20 features and benefits:

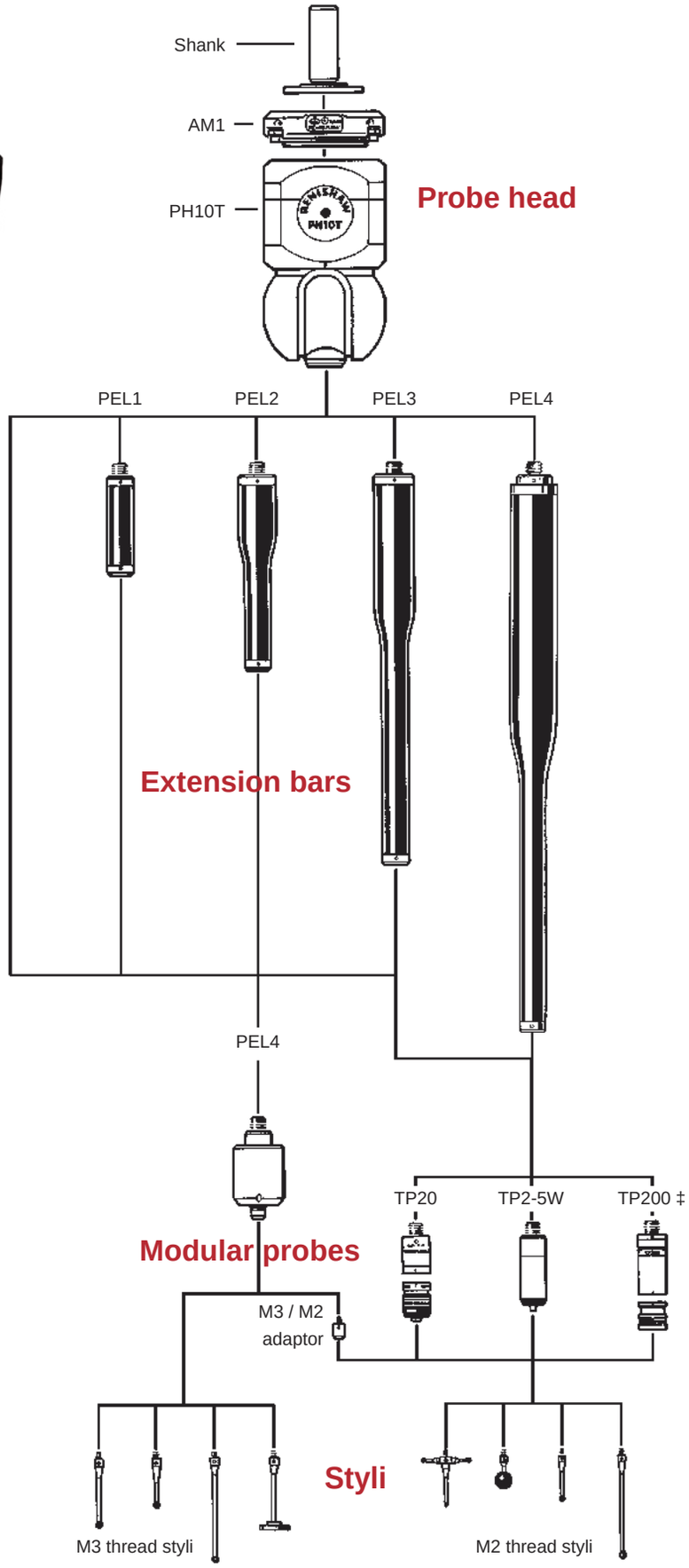
- Improved productivity is achieved via probe module changing and automated indexing, without the need for constant requalification.
- A built-in extension together with existing extension bars allow reach up to 168 mm (including maximum stylus length).
- Utilising the CMM motion to lock, unlock and 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.
- Position repeatability:
  1.5µm (TP20SF) 2.5µm (TP20EM2)



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.

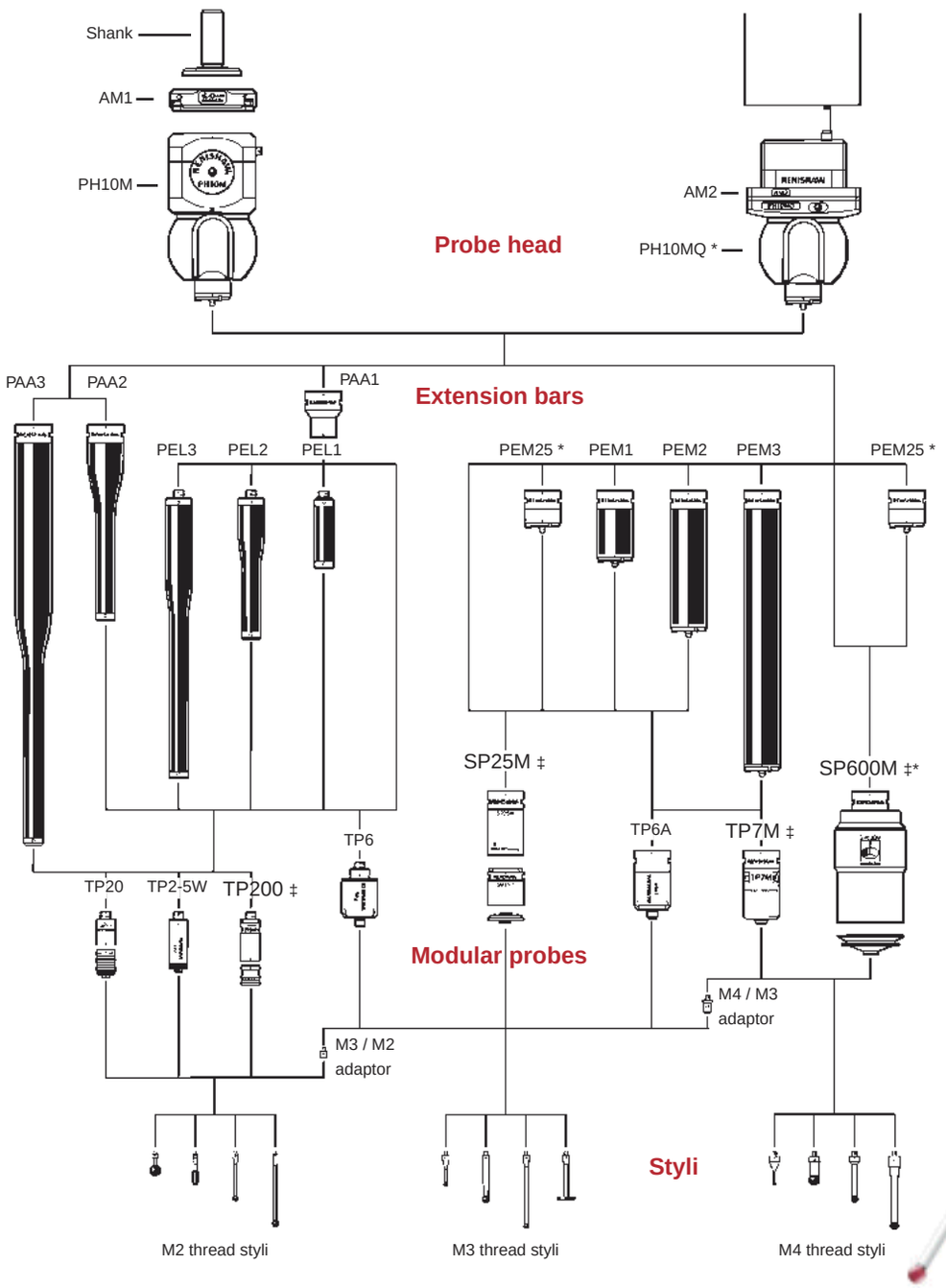
PH10T features and benefits:

- 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
- Position repeatability:
  0.4µm at a distance of length 100mm

Detail information see www.renishaw.com

PH10M & PH10MQ motorised indexing probe heads

Probing systems for coordinate measuring machines



PH10M

PH10MQ

- 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.

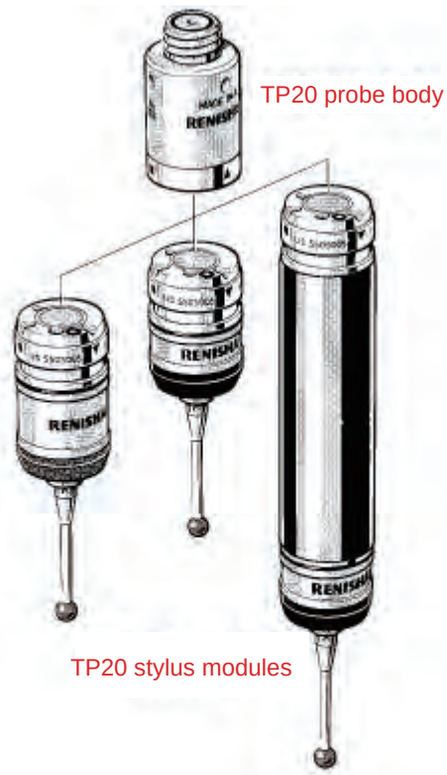
Detail information see www.renishaw.com

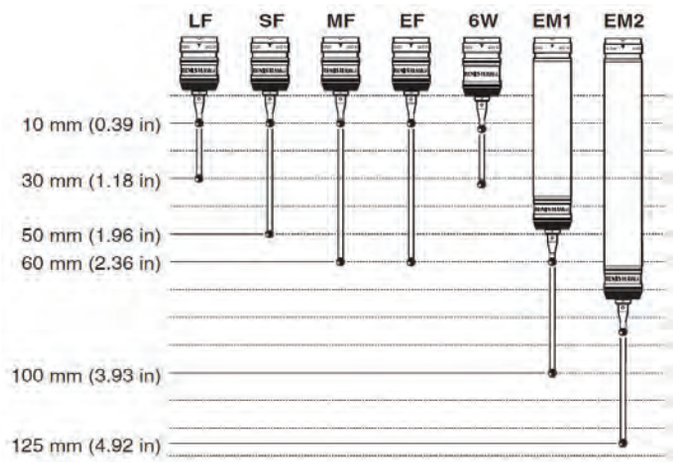
Probing systems for coordinate measuring machines

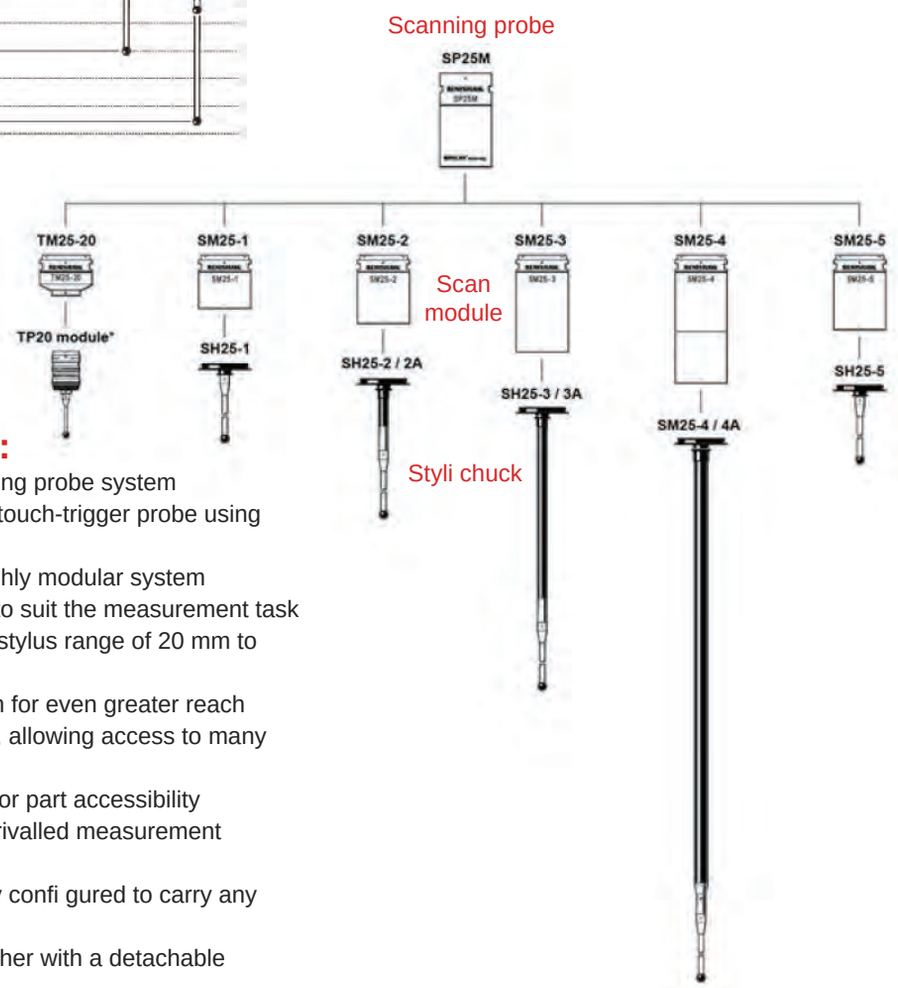
TP20 modular probes

The TP20 is a 5-way or 6-way kinematic touchtrigger probe. Its two piece design comprises a probe body and detachable stylus module(s), which gives the ability to change stylus confi gurations either manually or automatically without re-qualifi cation of the stylus tips, providing signifi cant time savings in inspection routines. A direct replacement for the industry standard Renishaw TP2 probe, the TP20 probe system brings a range of new benefi ts to manual and DCC CMM applications, and can easily be retrofi tted 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.







PH10M & PH10MQ

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 effi cient 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 confi gured 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

Detail information see www.renishaw.com

Unique and excellent characteristics

Enhance efficiency

Faster calibration

Increased measuring accuracy

Limitless angles and positions

Reduced measuring errors in mechanical motion

Measurement example—The valve body achieves a 300% improvement in work efficiency

Transform your CMM performance with 5-axis touch-trigger measurement.

PH20 = 5 axis stepless indexing automatic trigger probe (equipped with UCC T5 controller)

PH20 = 3 axis stepless indexing automatic trigger probe (equipped with UCC MT5 controller)

system

Applicable to all existing TP20 anti-collision magnetic modules
-Except EF high force measuring module
-Effective measuring length up to 166mm

Can be used with MCR20NI exchange rack for automatic module replacement

specification

Rotation angle of probe head
A axis: -115° to +115° B axis: ∞ infinite

Angle resolution of probe head: 0.4um/RAD (0.08 arc second)

Fast turning angle: 3 turns/sec (1281mm/sec, with 10mm long stylus)

Maximum touch speed of probe: 50mm/sec (UCC T5)

Internal bearing of probe head: mechanical type (no air source required)

- The probe head and CMM synchronized motion technology developed by the multi-award-winning REVO system can greatly reduce the dynamic error of the mechanism itself caused by CMM high-speed measurement (UCC T5)
- The functional design at any angle ensures the best results and reduces the replacement of styli
- It can be automatically adjusted according to the workpiece coordinate system to avoid stylus collision and reduce the need for precision fixtures
- The unique design of probe collision allows the work of picking points to be completed by the probe head, without relying entirely on the movement of the CMM, and picking points faster and with better accuracy and reproducibility (UCC T5)
- The movement and simultaneous movement of 5-axis control can reduce the space required for the angle of the probe and increase the measurement speed, resulting in a three-fold improvement in the work efficiency of the CMM (UCC T5)
- Integrate the industry standard anti-collision protection magnetic TP20 trigger probe, which can be directly equipped with a series of probe modules, stylus, extension rods and exchange racks to meet the needs of application measurement

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

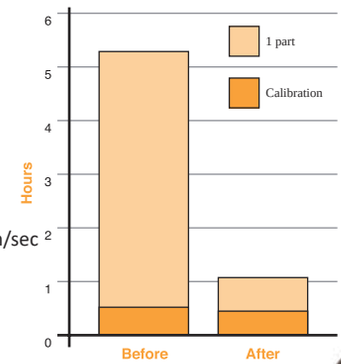
Before

- 3-axis scanning at 15 mm/sec measurement time = 29 min 13 sec

After

- REVO® at 400 mm/sec and 50 mm/sec 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

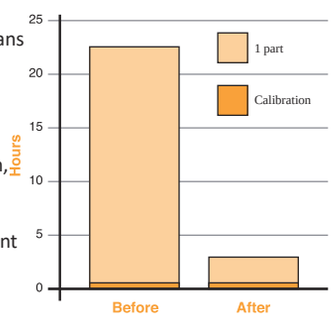
Before

- 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 **Renscan5**™ 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