

TP200 / TP200B modular probes

The TP200/TP200B are electronic probes using strain gauge technology, which gives higher accuracy than kinematic touch-trigger probes. They combine outstanding metrology performance with superior functionality to produce a highly versatile DCC CMM probing system with excellent productivity.

The TP200 system components are:

- TP200 probe body – the standard model
- TP200B probe body – a variant model with increased vibration tolerance
- TP200 stylus module – choice of fixed overtravel forces: 'SF' (standard force) or 'LF' (low force)

There is also the 'EO' (extended overtravel) module, which has the same overtravel force as the 'SF' but provides increased operating range and protection in the probe Z axis

- PI 200 probe interface
- SCR200 stylus changing rack

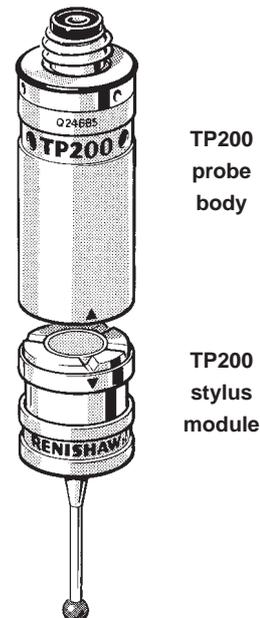
TP200 probe body

The TP200 probe incorporates micro strain gauge transducers, delivering excellent repeatability and accurate 3D form measurement even with long styli. The sensor technology gives sub-micron triggering performance and eliminates the lobing characteristics encountered with standard probes. The solid-state ASIC electronics within the probe ensure reliable operation over millions of trigger points.

TP200B probe body

The TP200B probe uses the same technology as TP200 but has been designed to have a higher tolerance to vibration. This helps to overcome the problem of 'air' trigger generation which can arise from vibrations transmitted through the CMM or when using longer styli with faster positioning speeds.

NOTE: We do not recommend the use of TP200B with the LF module or cranked/star styli.



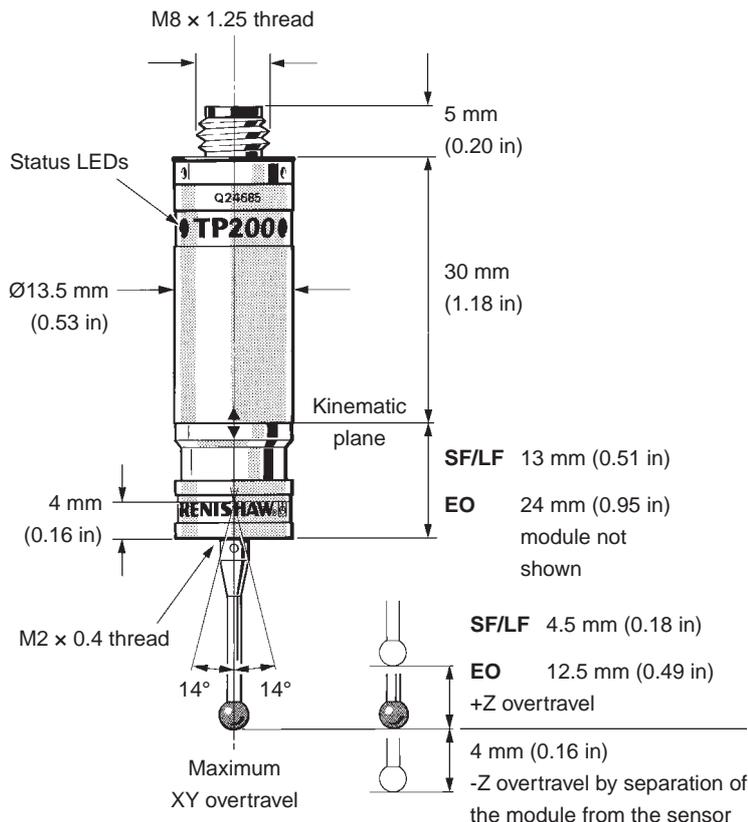
Probing systems for co-ordinate measuring machines

TP200 stylus module

The stylus module is mounted on the probe via a highly repeatable magnetic kinematic joint, providing a rapid stylus changing capability and probe overtravel protection.

There are three modules available, with two different overtravel forces:

- The SF (standard force) module is suitable for most applications.
- The LF (low force) module is recommended for use with small precision ball styli or on delicate materials.
- The EO (extended overtravel) module is recommended for use when increasing the speed of the CMM may lead to stopping distances which exceed the overtravel range provided in the SF/LF modules. The EO module has an additional 8 mm (0.32 in) of overtravel in the probe Z axis to protect against damage to the sensor in such circumstances. Overtravel force is the same as the SF module.



PI 200 probe interface

The PI 200 is a unit capable of the automatic recognition and interfacing of TP200/B and also conventional touch-trigger probes (TP2, TP6, TP20). Two switchable levels of probe trigger sensitivity are provided to accommodate differing applications. The PI 200 interface is covered fully in section 9.



SCR200 stylus changing rack

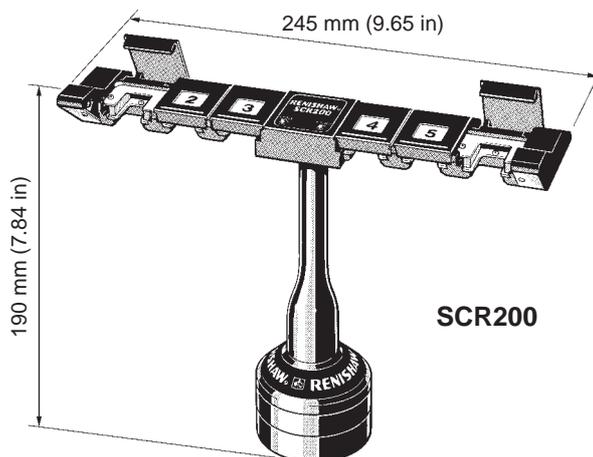
The SCR200 provides rapid, automatic changing of stylus modules without the need to re-qualify stylus tips. The SCR200 is powered entirely by the PI 200 and provides features to facilitate safe stylus changing.

MSR1 module storage rack

For manual storage of modules - see section 13.

Probe maintenance

CK200 (Renishaw part number A-1085-0016) is a specialised cleaning material supplied for the removal of contamination from the location faces of the magnetically retained kinematic couplings of the TP20, TP200 and SP25M probe systems. The frequency of cleaning should be determined according to the conditions of use.



TP200 / TP200B features and benefits:

- Excellent repeatability and precision 3D form measurement
- Rapid exchange between stylus configurations without the need to re-calibrate
- 6-way measuring capability ($\pm X$, $\pm Y$, $\pm Z$)
- SF and LF modules to give overtravel force to suit the application
- EO module to give increased overtravel in probe Z axis
- Zero reset errors and no lobing effect
- Suitable for intensive 'peck' or 'stitch' scanning
- Stylus reach up to 100 mm (3.99 in) GF range
- Module life of >10 million triggers
- Compact size
- Compatible with the full range of Renishaw probe heads and accessories



Specification summary			TP200	TP200B
PRINCIPAL APPLICATION			DCC CMM where high accuracy is required.	As TP200 but where 'air'* trigger events occur.
SENSE DIRECTIONS			6-axis: $\pm X$, $\pm Y$, $\pm Z$	6-axis: $\pm X$, $\pm Y$, $\pm Z$
UNIDIRECTIONAL REPEATABILITY (2 σ μ m)	Trigger level 1		0.40 μ m (0.000016 in)	0.40 μ m (0.000016 in)
	Trigger level 2		0.50 μ m (0.00002 in)	0.50 μ m (0.00002 in)
XY (2D) FORM MEASUREMENT DEVIATION	Trigger level 1		± 0.80 μ m (0.000032 in)	± 1 μ m (0.00004 in)
	Trigger level 2		± 0.90 μ m (0.000036 in)	± 1.2 μ m (0.000047 in)
XYZ (3D) FORM MEASUREMENT DEVIATION	Trigger level 1		± 1 μ m (0.00004 in)	± 2.50 μ m (0.0001 in)
	Trigger level 2		± 1.40 μ m (0.000056 in)	± 4 μ m (0.00016 in)
REPEATABILITY OF STYLUS CHANGE	With SCR200		± 0.50 μ m (0.00002 in) max.	± 0.50 μ m (0.00002 in) max.
	Manual		± 1 μ m (0.00004 in) max.	± 1 μ m (0.00004 in) max.
TRIGGER FORCE (at stylus tip)	XY plane	All modules	0.02 N	0.02 N
	Z axis	All modules	0.07 N	0.07 N
OVERTRAVEL FORCE (@ 0.50 mm displacement)	XY plane	SF/EO module	0.2 N to 0.4 N	0.2 N to 0.4 N
		LF module	0.1 N to 0.15 N	0.1 N to 0.15 N
	Z axis	SF/EO module	4.90 N	4.90 N
		LF module	1.60 N	1.60 N
WEIGHT (probe sensor and module)			22 g (0.78 oz)	22 g (0.78 oz)
MAXIMUM EXTENSION (if on a PH10 series head)			300 mm (11.81 in)	300 mm (11.81 in)
MAXIMUM RECOMMENDED STYLUS LENGTH (M2 styli range)		SF/EO module	50 mm (1.97 in) steel to 100 mm (3.94 in) GF	50 mm (1.97 in) steel to 100 mm (3.94 in) GF
		LF module	20 mm (0.79 in) steel to 50 mm (1.97 in) GF	20 mm (0.79 in) steel to 50 mm (1.97 in) GF
MOUNTING METHOD			M8 thread	M8 thread
SUITABLE INTERFACE			PI 200, UCC	PI 200, UCC
STYLUS MODULE CHANGING RACK	Automatic		SCR200	SCR200
	Manual		MSR1	MSR1

Above data applies for test conditions as follows: Stylus length 50 mm (1.97 in) Stylus velocity 480 mm/min (1.57 ft/min).

* Air trigger (or false trigger). The TP200B reduces probe triggers that may be caused by vibrations.