

TP20/TP20 NI 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 requalification of the stylus tips. It affords significant time savings in inspection routines.

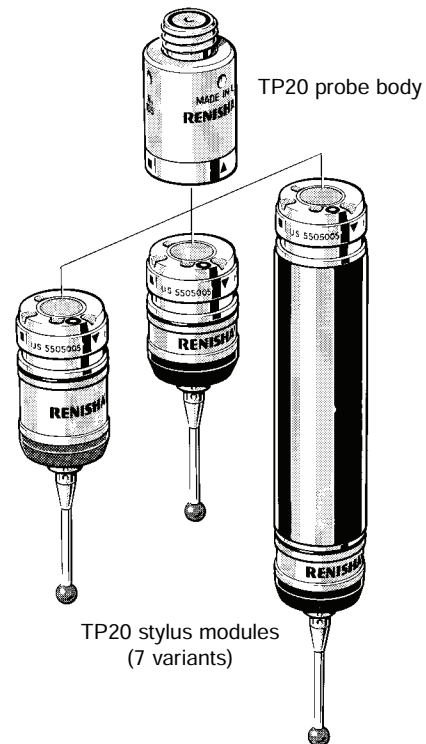
A direct replacement for the industry standard Renishaw TP2 probe, the TP20 probe system brings a range of new benefits to manual and DCC CMM applications, and can easily be retrofitted to existing TP2 installations.

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

The system components are:

- TP20/TP20 NI probe body
- TP20 stylus module – seven module variants allow for optimization of performance to suit the application
- MCR20 module changing rack – automatic operation

The TP20 probe system may be used with Renishaw's PI 4-2, PI 7-2 or PI 200 probe interfaces.



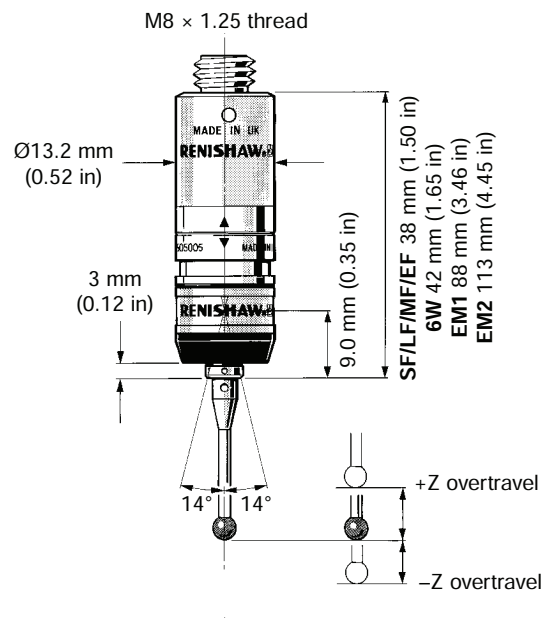
TP20 probe body

The TP20 probe body houses one half of the highly repeatable magnetic kinematic coupling that attaches the stylus module and body. The body also contains a magnetic proximity switch to inhibit triggering of the probe during automatic module changing with MCR20.

Note: If the probe is operated close to magnetized parts/clamping etc, the probe trigger may become inhibited. Countermeasures include the use of long styli, stylus extensions or body orientation to increase the distance to the magnetic source. Alternatively, use the TP20 NI probe body.

TP20 NI probe body

The TP20 NI probe differs from the TP20 body in that it is not affected by magnetic fields. However the probe trigger must be inhibited through software during change cycles using the MCR20.



+Z overtravel

SF/EM1/EM2	4.0 mm (0.16 in)
LF	3.1 mm (0.12 in)
MF	3.7 mm (0.15 in)
EF	2.4 mm (0.09 in)
6W	4.5 mm (0.177 in)

-Z overtravel

6W	1.5 mm (0.06 in)
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Specification summary		TP20	TP20 NI
Principal application		DCC and manual CMMs suitable for most applications	DCC and manual CMMs where operation is within a magnetic field
Sense directions	All modules except 6W 6W	±X, ±Y, +Z ±X, ±Y, ±Z	±X, ±Y, +Z ±X, ±Y, ±Z
Pre-travel variation	LF	±0.6 µm (±0.000023 in)	±0.6 µm (±0.000023 in)
	SF/EM1/EM2	±0.8 µm (±0.000032 in)	±0.8 µm (±0.000032 in)
	MF	±1.0 µm (±0.000039 in)	±1.0 µm (±0.000039 in)
	EF	±2.0 µm (±0.000079 in)	±2.0 µm (±0.000079 in)
	6W	±1.5 µm (±0.000058 in)	±1.5 µm (±0.000058 in)
Repeatability of stylus change (max)	With SCR200	±0.5 µm (±0.000020 in)	±0.5 µm (±0.000020 in)
	Manual	±1.0 µm (±0.000040 in)	±1.0 µm (±0.000040 in)
Stylus range		M2	M2
Probe mounting method		M8 thread	M8 thread
Suitable interface		PI 4-2, PI 7-2, PI 200	PI 4-2, PI 7-2, PI 200
Stylus module changing rack (automatic)		MCR20	MCR20
Stylus module storage rack (manual)		MSR1	MSR1



Module type and test stylus length	Trigger force		Overtravel force			Overtravel displacement			Unidirectional repeatability 2σ at stylus tip	2D (XY) form error
	XY	Z	XY	+Z	-Z	XY	+Z	-Z		
SF (black cap) 10 mm	0.08 N	0.75 N	0.2-0.3 N	3.5 N	-	±14°	4.0 mm (0.16 in)	-	0.35 µm (0.000014 in)	±0.8 µm (±0.000032 in)
LF (green cap) 10 mm	0.055 N	0.65 N	0.09 N	1.15 N	-	±14°	3.1 mm (0.12 in)	-	0.35 µm (0.000014 in)	±0.6 µm (±0.000024 in)
MF (grey cap) 25 mm	0.1 N	1.9 N	0.2-0.4 N	7.0 N	-	±14°	3.7 mm (0.15 in)	-	0.50 µm (0.000020 in)	±1.0 µm (±0.000039 in)
EF (brown cap) 50 mm	0.1 N	3.2 N	0.2-0.5 N	10.0 N	-	±14°	2.4 mm (0.09 in)	-	0.65 µm (0.000026 in)	±2.0 µm (±0.000079 in)
6W (blue cap) 10 mm	0.14 N	1.6 N	0.25 N	2.5 N	9.0 N	±14°	4.5 mm (0.18 in)	1.5 mm (0.059 in)	0.80 µm (0.000032 in)	±1.5 µm (±0.000059 in)
EM1 10 mm	0.08 N	0.75 N	0.2-0.3 N	3.5 N	-	±14°	4.0 mm (0.16 in)	-	0.35 µm (0.000014 in)	±0.8 µm (±0.000032 in)
EM2 10 mm	0.08 N	0.75 N	0.2-0.3 N	3.5 N	-	±14°	4.0 mm (0.16 in)	-	0.35 µm (0.000014 in)	±0.8 µm (±0.000032 in)

The above data applies for test conditions as follows:

Stylus length as stated above.

Stylus velocity 480 mm/min (1.57 ft/min)

EM2 EM1 LF SF MF EF 6W TP20

