

RMP400S (QE) high-accuracy radio machine probe with scanning



Specification

Principal application		Workpiece inspection, job set-up and surface finish verification on multi-tasking machines and machining centres.
Weight without shank (including batteries)		348 g (12.28 oz)
Transmission type		Hybrid frequency-hopping spread spectrum (FHSS) radio Radio frequency 2400 MHz to 2483.5 MHz
Radio approval regions		UK, EU, EFTA, Japan and USA (China exempt). For details about other regions, contact Renishaw.
Compatible receiver / interface		RMM-QE and USI
Operating range		Up to 15 m (49.2 ft)
Recommended styli		High modulus carbon fibre, lengths 50 mm (1.97 in) to 100 mm (3.94 in). Stylus ball diameter 2 mm (0.08 in) to 6 mm (0.24 in).
Stylus type	Touch-trigger and scanning	Straight styli only. See <i>Styli recommendations for on-machine scanning probes</i> (Renishaw part no. H-5465-8102).
	Surface finish	Specialist styli only. See <i>Styli recommendations for on-machine scanning probes</i> (Renishaw part no. H-5465-8102).
Switch-on / switch-off options		Radio on  Radio off
Probe switch-on time		1 second
Probe feedrate (minimum)		3 mm/min (0.12 in/min) ¹
Spindle speed (maximum)		1000 r/min
Battery life (2 × ½AA 3.6 V lithium-thionyl chloride)		Standby life Continuous life (touch-trigger) Continuous life (scanning)
		31 months 180 hours 140 hours
Sense directions		±X, ±Y, +Z
Scanning measurement range (±X, ±Y)		±0.5 mm (0.02 in), with a calibrated range between 0.05 mm (0.002 in) and 1.05 mm (0.04 in). Nominal deflection 0.55 mm (0.02 in) when using a 100 mm (3.94 in) stylus.
Sensor resolution (µm/digit) ²		0.028 µm/digit (1.1 µin/digit)
Unidirectional repeatability (touch-trigger) ³		0.25 µm (10 µin) 2σ – 50 mm stylus length 0.35 µm (14 µin) 2σ – 100 mm stylus length
X, Y (2D) form measurement deviation (touch-trigger) ³		±0.25 µm (10 µin) – 50 mm stylus length ±0.25 µm (10 µin) – 100 mm stylus length
X, Y, Z (3D) form measurement deviation (touch-trigger) ³		±1.00 µm (40 µin) – 50 mm stylus length ±1.75 µm (70 µin) – 100 mm stylus length
Stylus trigger force ⁴ XY plane (typical minimum) +Z plane (typical minimum)		0.007 N, 0.7 gf (0.03 ozf). Trigger filter (Level 2). 50 mm stylus length 0.1 N, 10.2 gf (0.40 ozf). Trigger filter (Level 1). 50 mm stylus length
Stylus overtravel force XY plane (typical minimum) +Z plane (typical minimum)		1.00 N, 102 gf (3.6 ozf) – 50 mm stylus length ⁵ 0.6 N, 61.2 gf (2.2 ozf) – 100 mm stylus length ⁶ 8.30 N, 846 gf (29.9 ozf) ⁷
Stylus overtravel		XY plane +Z plane
		±10° 6 mm (0.24 in)
Stylus scanning force XY (typical)		Spring rate ⁸ 0.3 N/mm (2.00 lb/in)
		Measuring force ^{8,9} 0.015 N 1.53 gf (0.05 ozf)

Specification (continued)

Environment	IP rating	IPX8, BS EN 60529:1992+A2:2013
	IK rating (typical)	IK01 (EN/IEC 62262: 2002) [for glass window]
	Storage temperature	–25 °C to +70 °C (–13 °F to +158 °F)
	Operating temperature	+5 °C to +55 °C (+41 °F to +131 °F)
	Indoor/outdoor use	Indoor use
	Altitude	≤ 3000 m (9843 ft)
	Relative humidity	5% to 95%
	Wet location	Yes, water/oil/coolant
	Pollution degree	Level 2

¹ Speeds below 3 mm/min (0.12 in/min) commonly occur when manually moving the probe using the handwheel with a very fine feedrate.

² In scanning mode.

³ Performance specification is tested at a standard test velocity of 240 mm/min (9.45 in/min) with a 50 mm carbon fibre stylus. Significantly higher velocity is possible depending on application requirements.

⁴ Trigger force, which is critical in some applications, is the force exerted on the component by the stylus when the probe triggers. The maximum force applied will occur after the trigger point (overtravel). The force value depends on related variables, including measuring speed, machine deceleration and system latency. RENGAGE equipped probes offer ultra-low trigger forces when probing at low feedrates. Tested at the lowest recommended feedrate (3 mm/min (0.12 in/min)).

⁵ Stylus overtravel force in the XY plane occurs 0.8 mm (0.03 in) after the trigger point and rises by 0.12 N/mm, 12.24 gf/mm (0.02 ozf/in) until the machine tool stops (in the high force direction and using a 50 mm carbon fibre stylus).

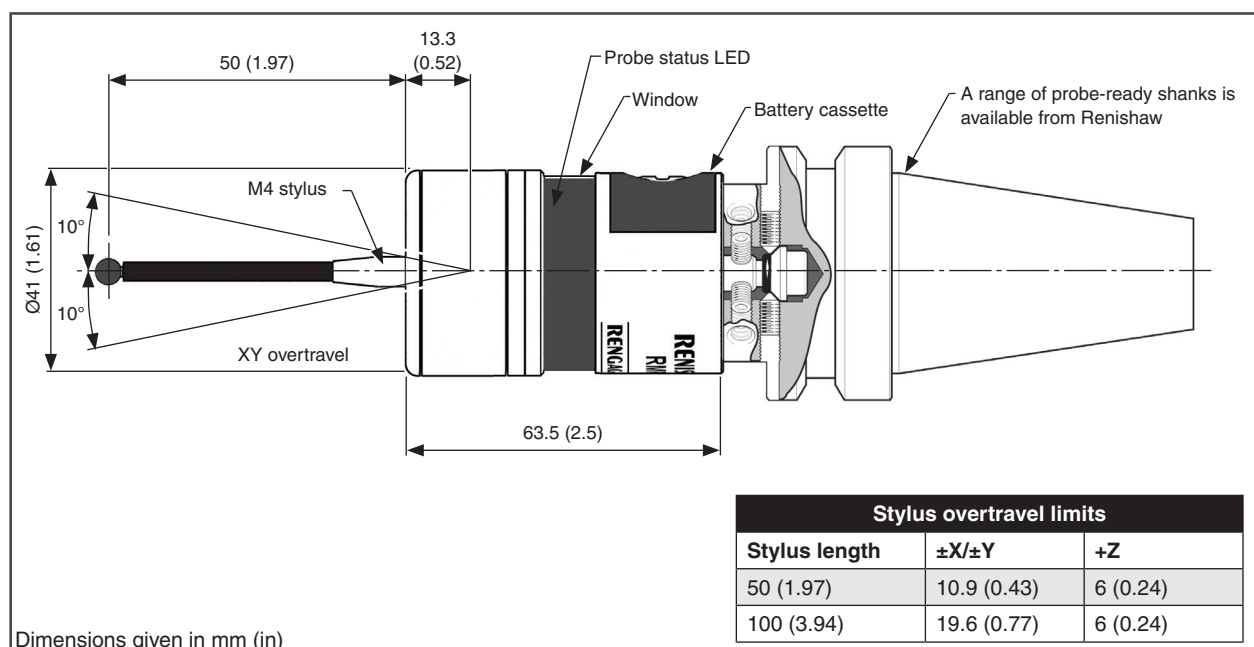
⁶ Stylus overtravel force in the XY plane occurs 1.5 mm (0.06 in) after the trigger point and rises by 0.07 N/mm, 7.12 gf/mm (0.01 ozf/in) until the machine tool stops (in the high force direction and using a 100 mm carbon fibre stylus).

⁷ Stylus overtravel force in +Z direction increases linearly at a rate of 52.0 N/mm, 5303 gf/mm (7.36 ozf/in) to 8.3 N, 846.4 gf (29.9 ozf) when deflected by 0.15 mm (0.006 in). It will increase by 0.96 N/mm, 97.9 gf/mm (0.14 ozf/in) until the machine tool stops.

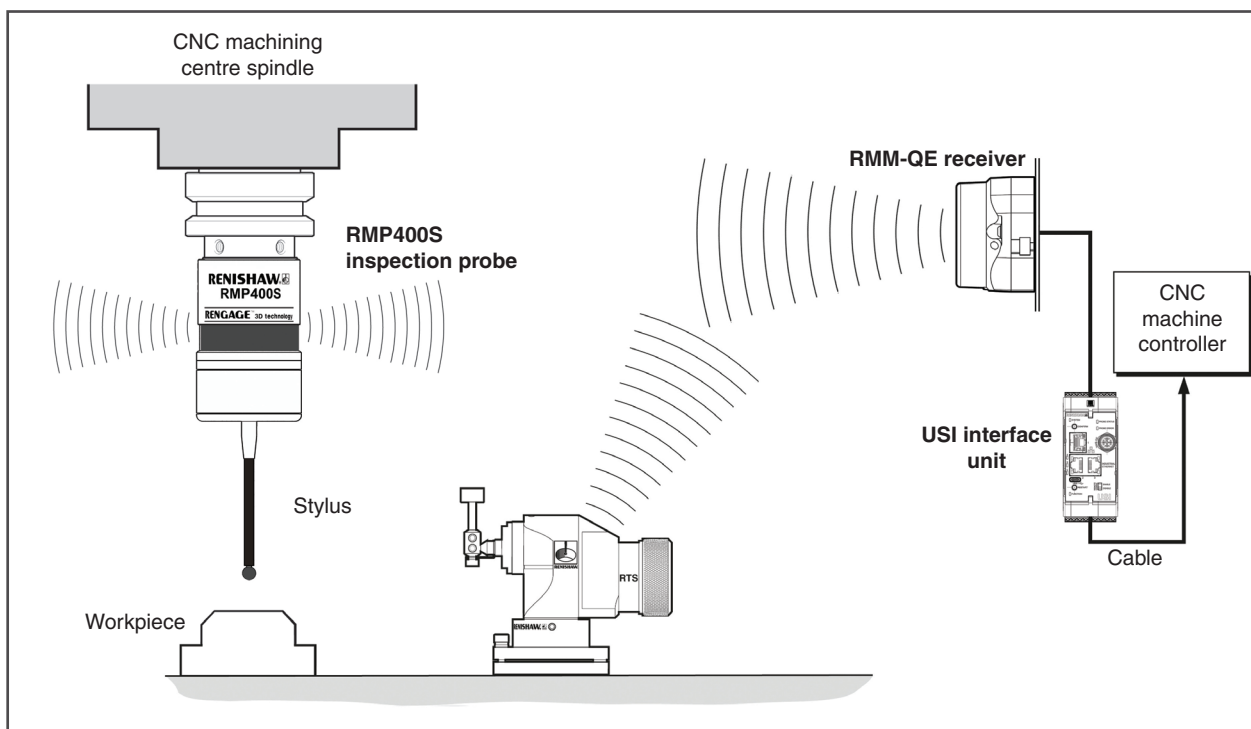
⁸ Typical for a 100 mm carbon fibre stylus.

⁹ Stylus deflection of 0.05 mm (0.002 in).

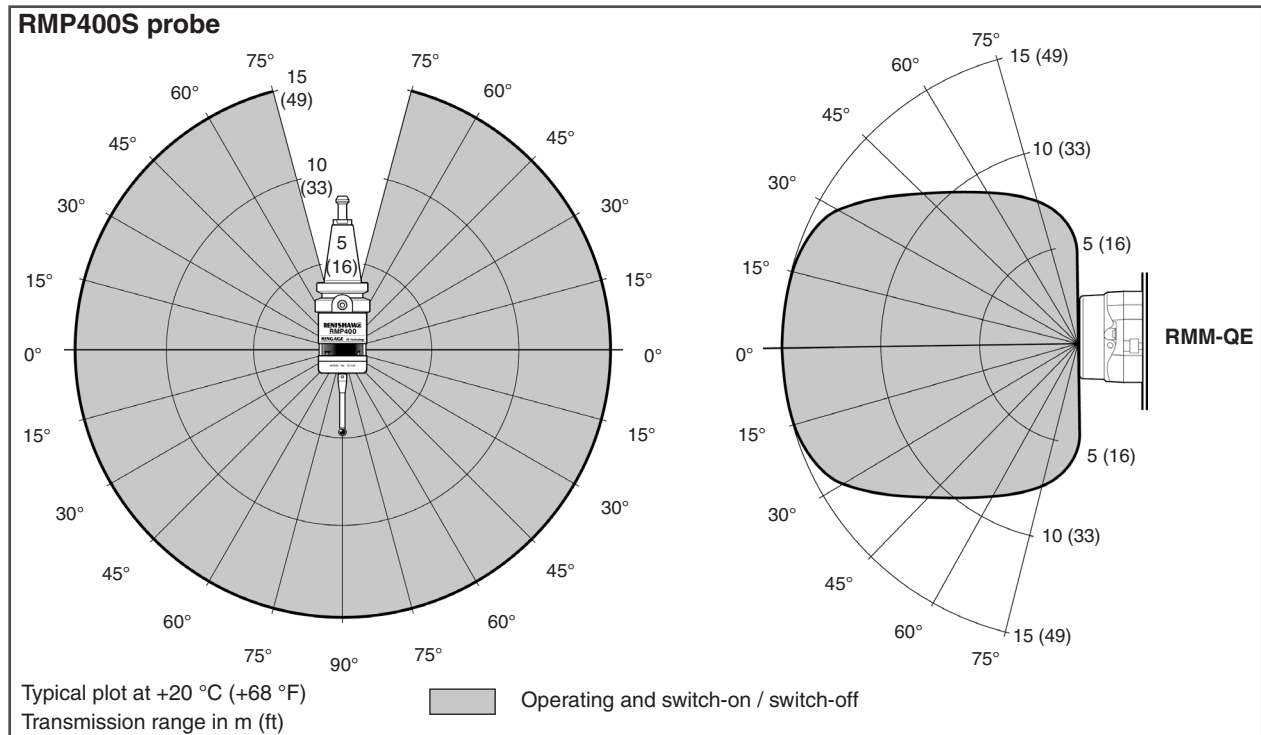
RMP400S dimensions



Installing the RMP400S with a RMM-QE and USI



RMP400S performance envelope



Spare parts and accessories

A full range of spare parts and accessories is available. Contact Renishaw for a full list.

www.renishaw.com/contact



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Part no.: H-6970-8200-01-A

Issued: 06.2026