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RMP600 high accuracy radio machine probe

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RMP600 - an unrivalled combination of flexibility and accuracy

RMP600 is the latest compact radio transmission probe from Renishaw and is ideally suited for use on all sizes of machining centres. It combines the proven frequency hopping spread spectrum (FHSS) transmission of the highly successful and award winning RMP60 probe with new advances in strain gauge technology pioneered by Renishaw's high accuracy MP700 probe.

Benefits

Compact

At only 63 mm in diameter and 76 mm in length, and with an omni-directional transmission distance of 15 m, the RMP600 is ideal for machines of all sizes.

Robust and reliable

The RMP600 sets new standards for reliability and is designed to resist the harshest machine conditions. Solid-state strain gauge technology results in up to 10 times the life of traditional probes.

High accuracy

Incorporates **RENGAGE™** technology to provide even lower pre-travel variation than that found in Renishaw's industry leading MP700. This, combined with an extremely high level of repeatability, makes the RMP600 the ideal solution for measurement of mould, die and other complex parts.

Multiple probe mode

Multiple probe mode is available to allow individual application of multiple probes with a single RMI receiver.

Simple upgrade

Utilising the same shank mounting arrangement as the RMP60, and being compatible with the RMI, this new product gives existing users a simple upgrade path to a higher performance solution.

Features

- Meets the radio regulations of the EU and countries including the USA, Japan, Canada, Switzerland, Australia and New Zealand.

- Probe repeatability of ± 0.25 µm (10 µin) 2σ is certified with a 50 mm carbon fibre stylus at 240 mm/min.

- Increased stylus lengths can be supported without a significant decrease in probe performance.

- Interference-free channel hopping transmission.

- Incorporates Renishaw's Trigger Logic™. This allows configurable probe settings to be changed by systematically deflecting the stylus until the correct colour configuration is observed on the LED display.

- Powered by two AA batteries. Battery life when using alkaline batteries is in excess of 100 hours continuous use.

- The probe turn-on method is configurable between M code, spin-on or shank switch. The probe turn-off method is configurable between M code, spin-off, shank switch and timer-off.

- The probe is sealed to IPX8 and designed for the machine tool environment.

Typical probe system
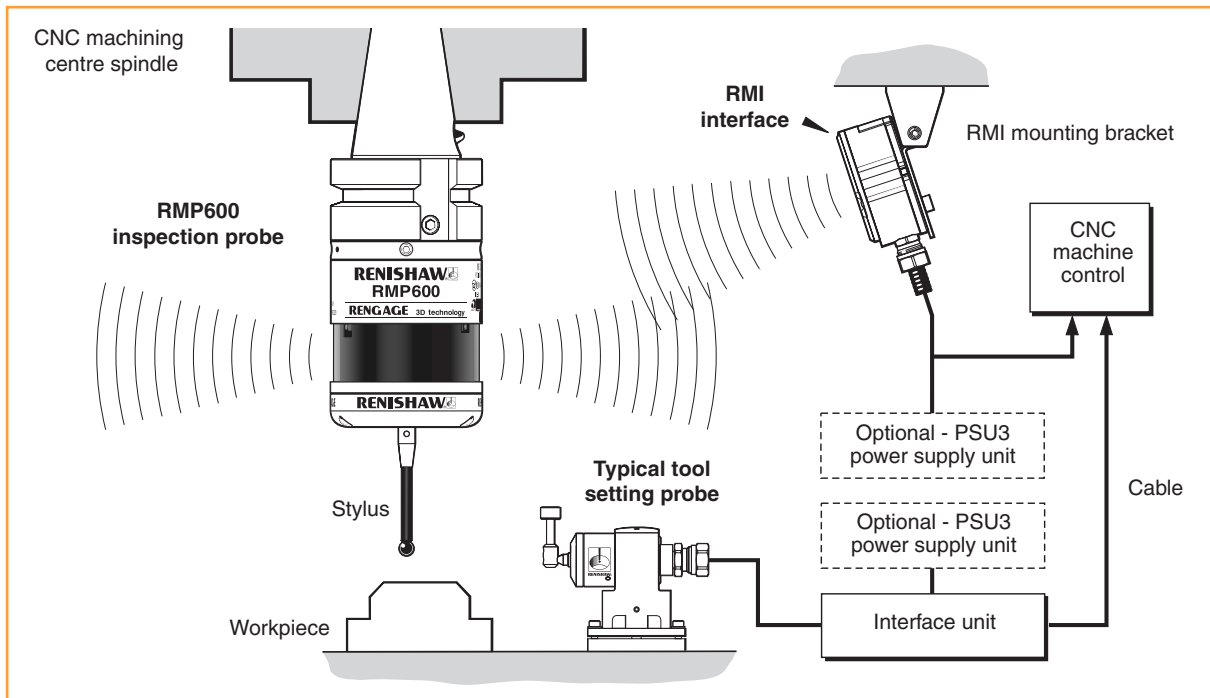
Probe modes

The RMP600 probe can be in one of three modes:

1. **Standby mode** - The RMP600 is waiting for a switch-on signal to be received;

2. **Operational mode** - Activated by one of the switch-on methods described below. In this mode the RMP600 is now ready for use;

3. **Configuration mode** - The Trigger Logic™ configuration method allows the following settings to be configured.

Probe settings

Enhanced trigger filter

Probes subjected to high levels of vibration or shock loads may output signals without having contacted any surface. The enhanced trigger filter improves the probe's resistance to these effects.

When the filter is enabled, a constant 8 or 32 ms delay is introduced to the probe's output. The probe is factory set to 8 ms, but 32 ms can be selected by users if false triggering is evident.

Auto-reset function

The Auto-reset function in the RMP600 can compensate for stylus forces caused by changes in probe orientation, that can cause the probe to trigger. This feature is controlled by solid state accelerometers.

Multiple probes

RMP600 probes can be configured, using Trigger Logic™, to have the same radio ID. This allows multiple radio probes to be used with a single RMI (spin on or shank switch-on is required).

Acquisition mode

System set-up is achieved using Trigger Logic™ and powering on the RMI. Partnering is only required during initial system set-up and can take place anywhere within the operating envelope.

Switch-on / switch-off methods

Switch-on method	Switch-off method
Radio on Radio switch-on is commanded by machine input	**Radio off** Radio switch-off is commanded by machine input. **Timer off (time out)** Time out will occur after 12, 33 or 134 seconds (user configurable) after the last probe trigger or reseat.
Spin on Spin at 500 rev/min for 1 second minimum (6 seconds maximum).	**Spin off** Spin at 500 rev/min for 1 second minimum (6 seconds maximum). **Timer off (time out)** Time out will occur 12, 33 or 134 seconds (user configurable) after the last probe trigger or reseat.
Shank switch-on	**Shank switch-off**

Performance envelope

The RMP600 transmission envelope and range is shown below.

The probe system should be positioned so that the optimum range can be achieved over the full travel of the machine's axes including the tool magazine. Always face the RMI in the direction of the machine spindle and tool magazine.

If the probe is not in range when in the tool magazine use spin or shank switch on.
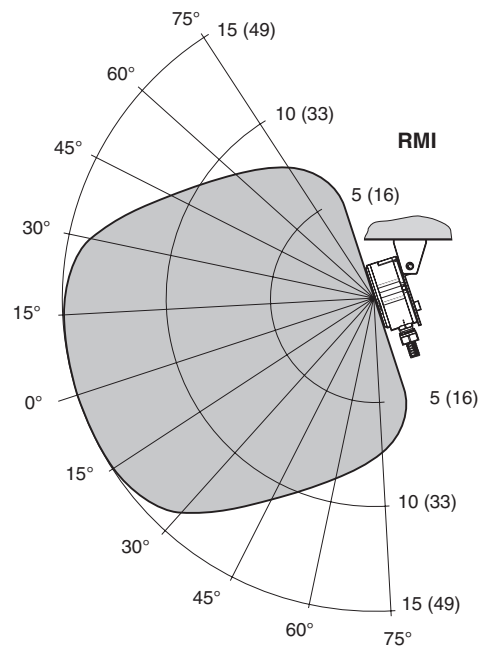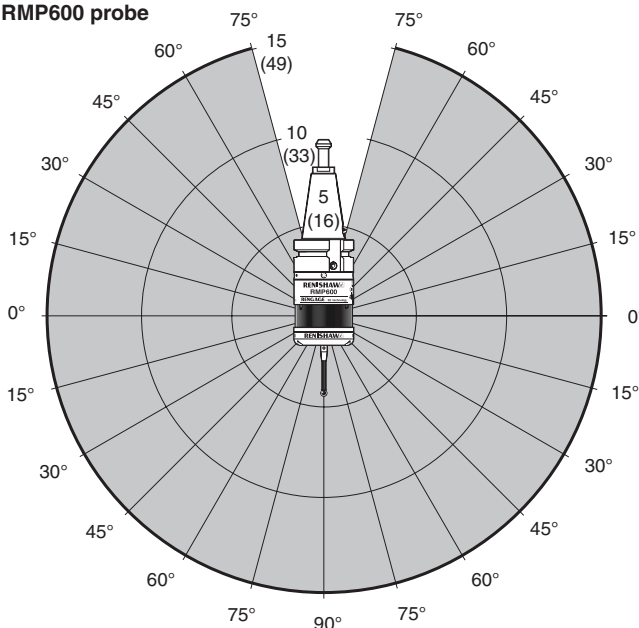
The RMP600 and RMI must be within a mutual operating envelope. The operating envelope shows line-of-sight performance. However, radio transmission does not require line-of-sight as long as any reflected radio path is less than the 15 m (49.2 ft) system operating range.

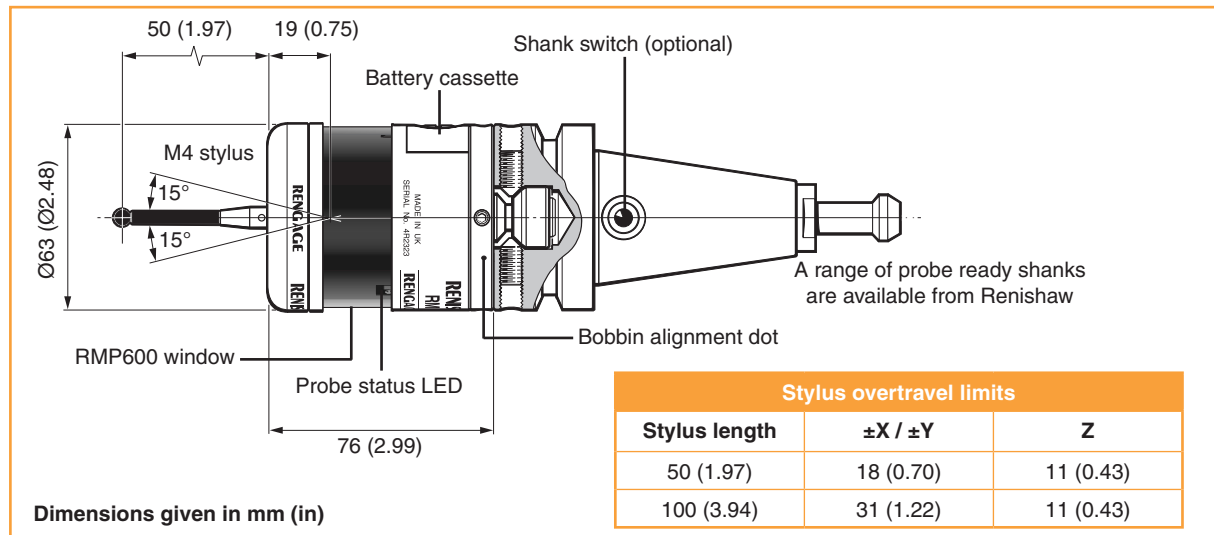### Performance envelope when using the RMP600 with the RMI

Range metres (feet)

Dimensions

50 (1.97) 19 (0.75)

Shank switch (optional)

Battery cassette

M4 stylus

15°

15°

Ø63 (2.48)

A range of probe ready shanks
are available from Renishaw

RMP600 window

Probe status LED

Bobbin alignment dot

76 (2.99)

Dimensions given in mm (in)

Stylus overtravel limits		
Stylus length	±X / ±Y	Z
50 (1.97)	18 (0.70)	11 (0.43)
100 (3.94)	31 (1.22)	11 (0.43)

Specification

Principal application	Workpiece measurement and job set-up on medium to large horizontal, vertical and gantry machining centres, 5 axis machines, twin spindle machines and vertical turret lathes.
Territory	EU, USA, Japan, Canada, Switzerland, Australia and New Zealand.
Transmission type	Frequency hopping spread spectrum radio (FHSS).
Radio frequency	2400 - 2483.5 MHz
Operating range	Up to 15 m (49.2 ft)
Weight (without shank in g) with batteries without batteries	1010 g (35.65 oz) 940 g (33.18 oz)
Sense directions	Omni-directional ± X, ± Y, + Z
Uni-directional repeatability	0.25 µm (10 µin) 2 sigma - 50 mm stylus length* 0.35 µm (14 µin) 2 sigma - 100 mm stylus length
2D lobing in X, Y	± 0.25 µm (10 µin) - 50 mm stylus length* ± 0.25 µm (10 µin) - 100 mm stylus length
3D lobing in X, Y, Z	± 1.00 µm (40 µin) - 50 mm stylus length* ± 1.75 µm (70 µin) - 100 mm stylus length
Stylus trigger force XY plane + Z direction	0.1 N, 10 gf (0.36 ozf) typical minimum 1.9 N, 193 gf (6.83 ozf) typical minimum
Stylus overtravel force XY plane +Z direction	1.2 N, 122 gf (4.31 ozf) typical minimum § 4.8 N, 489 gf (17.26 ozf) typical minimum †
Maximum spin speed	1000 rev/min
Stylus overtravel XY plane + Z direction	±15° 11 mm (0.43 in)
Sealing	IPX8 (BS 5490, IEC 529) 1 atmosphere

The stylus trigger force is the force exerted on the component when the probe triggers. However, the maximum force applied to the component will occur after the trigger point and will be greater than the trigger force. The magnitude depends on a number of factors affecting probe overtravel including measuring speed and machine deceleration. If the forces applied to the component are critical, contact Renishaw for further information.

* Performance specification is for a test velocity of 240 mm/min (9.45 in/min) with a 50 mm carbon fibre stylus. Test velocity does not constrain performance in application.

§ Stylus overtravel force in XY plane occurs 40 µm after the trigger point and rises by 0.19 N/mm, 19 gf/mm (17 oz/in) until the machine tool stops (in the high force direction and using a 50 mm carbon fibre stylus).

† Stylus overtravel force in + Z direction occurs 7 µm to 8 µm after the trigger point and rises by 1 N/mm, 102 gf/mm (76.2 oz/in) until the machine tool stops.
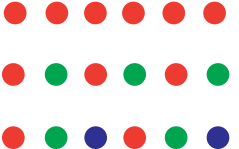
Battery life

Typical battery life:

Battery type	Shank/spin turn on		Radio turn on		Continuous use
Two AA type	Stand-by life (days - typical)	5% usage 72 minutes/day (days - typical)	Stand-by life (days - typical)	5% usage 72 minutes/day (days - typical)	(hours - typical)
1.5 V Alkaline	650	100	130	60	115
3.6 V Lithium Thionyl Chloride	1300	200	260	120	230

Rechargeable batteries: either 1.2 V Nickel Cadmium (NiCd) or 1.2 V Nickel Metal Hydride (NiMh) can be used. However, when these battery types are fitted, expect a battery life of approximately 50% of that quoted for alkaline batteries together with a reduced low battery warning period.

Probe status LEDs

LED colour	Probe status	Graphic hint
Flashing green	Probe seated in operating mode	🟢 🟢 🟢
Flashing red	Probe triggered in operating mode	🔴 🔴 🔴
Flashing green and blue	Probe seated in operating mode - low battery	🟢🔵 🟢🔵 🟢🔵
Flashing red and blue	Probe triggered in operating mode - low battery	🔴🔵 🔴🔵 🔴🔵
Constant red	Battery dead	▬▬▬
Flashing red or flashing red and green or sequence when batteries are inserted	Unsuitable battery	🔴 🔴 🔴 🔴 🔴 🔴 🔴 🟢 🔴 🟢 🔴 🟢 🔴 🟢 🔵 🔴 🟢 🔵
Constant blue	Probe damaged beyond use	▬▬▬

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Parts list

Please quote part number when ordering equipment.

Type	Part number	Description
RMP600	A-5312-0001	RMP600 probe with batteries, tool kit and quick-start guide (factory set to radio on / radio off)
Battery	P-BT03-0005	AA battery - Alkaline type supplied as standard with probe (two required)
Battery	P-BT03-0008	AA battery - Lithium Thionyl Chloride (two required)
Stylus	A-5003-7306	50 mm long carbon fibre with Ø6 mm ball
Stylus	A-5003-6510	100 mm long carbon fibre with Ø6 mm ball
Stylus	A-5003-6511	150 mm long carbon fibre with Ø6 mm ball
Stylus	A-5003-6512	200 mm long carbon fibre with Ø6 mm ball
Tool kit	A-4038-0304	Probe tool kit comprising Ø1.98 mm stylus tool, 2.0 mm AF hexagon key, 2.5 mm AF hexagon key (x 2), 4.0 mm AF hexagon key (x 2) and shank grub screw (x 2)
Battery cassette	A-4038-0300	Battery cassette assembly
Cassette seal	A-4038-0301	Battery cassette housing seal
Diaphragm kit	A-5312-0302	RMP600 diaphragm kit
Bobbin kit	A-4038-0303	Bobbin for shank switch (supplied with shank)
RMI	A-4113-0050	RMI, side exit, with 15 m (49.2 ft) cable, tool kit and user's guide
Mounting bracket	A-2033-0830	Mounting bracket with fixing screws, washers and nuts
Styli tool	M-5000-3707	Tool for tightening / releasing styli
Publications. These can be downloaded from our web site at www.renishaw.com		
RMP600	A-5312-8500	Quick start guide: for rapid setup of the RMP600, includes CD with installation guide
Styli	H-1000-3200	Technical specification: Styli and accessories
Software features	H-2000-2289	Data sheet: Probe software for machine tools - illustrated features
Software list	H-2000-2298	Data sheet: Probe software for machine tools - list of programs
Taper shanks	H-2000-2011	Data sheet: Taper shanks for machine tool probes
RMI	H-2000-5220	Installation and user's guide: RMI radio machine interface

For worldwide contact details, please visit our main website at

www.renishaw.com/contact

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