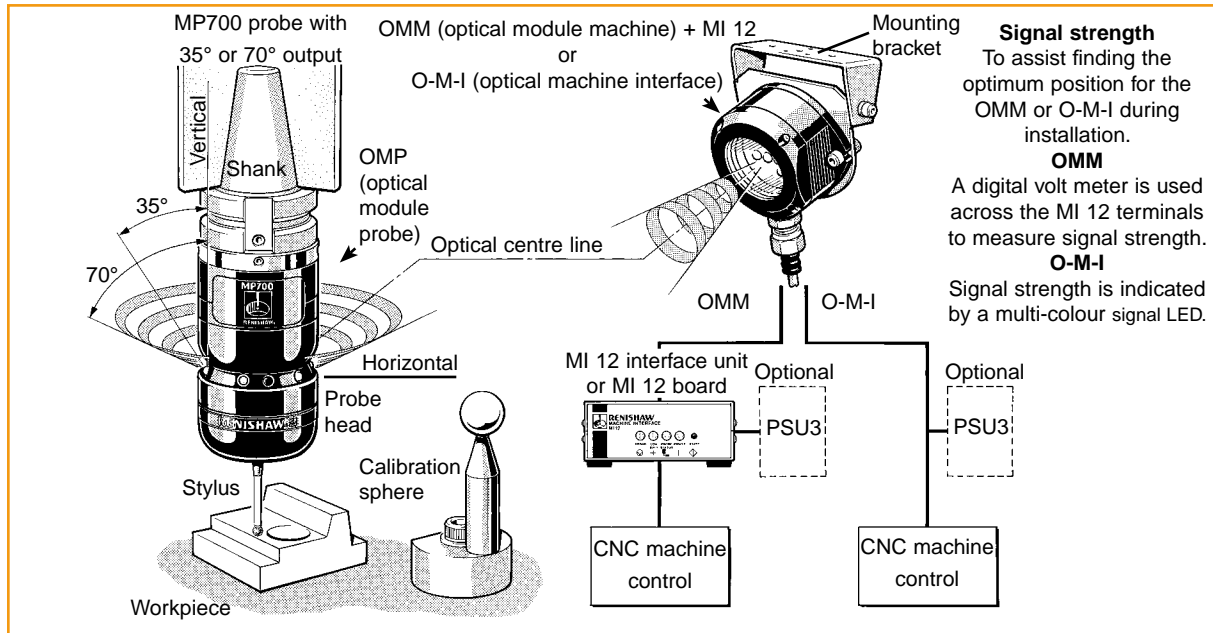


MP700 probe with 360° optical transmission system

www.renishaw.com/mp700



System components

- **MP700 probe**
3D touch trigger inspection probe ($\pm X$, $\pm Y$, $+Z$ directions). Signal transmission and reception is through 360°. The probe/OMP is sealed to IP68 and designed for reliable operation in the machine tool environment.
- **OMP (optical module probe)**
A transmitter/receiver module, containing optical signal LEDs and a 9V battery, which powers probe operation.
- **OMM (optical module machine) + MI 12 interface unit**
Signals pass from the CNC control to the OMP via the MI 12 and OMM and return along the same route. The MI 12 converts probe signals into a form compatible with the CNC control. OMM transmission and reception ranges are factory set to 100%. If OMM signals interfere with probes on other machines, then the optical range can be reduced.
- **O-M-I (optical machine interface)**
An alternative to the OMM + MI 12 interface, combining the functions of both OMM and MI 12 in one unit.
- **PSU3 power supply unit for O-M-I or MI 12**
Used when 24 V supply is not available from the machine.
- **Probing software**
Renishaw probing software is available for most types of machine control.

System features

- **Improved 3-dimensional pre-travel variation**
The non-lobing design means the probe is not direction dependant, greatly simplifying probe calibration routines for all styli, including long straight styli, star styli or cranked configurations – at any probe orientation.
- **High accuracy with long styli**
A low trigger force combined with low pre-travel, provides high accuracy measurement, even when using styli up to 200 mm (7.87 in) long.
NOTE: It is recommended that carbon fibre styli are used whenever possible.
- **Long life**
Use of strain gauge measurement sensors and micro technology results in a 10 times improvement in probe life and re-seat reliability.
- **Designed for a tough environment**
Specifically designed for the machine tool environment, offering high resistance to shock and vibration.
- **High speed operation**
Specifically designed for the machine tool environment, offering high resistance to shock and vibration.

Calibration sphere

Used when datuming the MP700 probe.

Data sheet

MP700 probe with 360° optical transmission system

System operation

CAUTION: Prior to probe operation, it is imperative to ensure that the program selected to 'drive' the probe has been verified. Incorrect programming could result in damage to the machine, workpiece or probe system.

The battery powered MP700 has two modes of operation.

1. Stand-by mode

To conserve battery life the probe is held in the stand-by mode, until the CNC control sends a start signal, via the OMM or O-M-I, to the OMP diodes (Rx), which receive through 360° around the probe. A start signal switches the probe to the operating mode.

2. Operating mode

During the operating mode, probe signals are transmitted through 360° from the OMP LEDs (Tx), to the OMM or O-M-I for onward transmission to the CNC control.

Probe switch-on

The probe is switched-on by one of the following methods.

NOTE: The probe must remain stationary for a minimum of one second after switch-on.

1. Manual start (System with OMM + MI 12 only)

Initiated by pressing the MI 12 manual start button.

2. Machine start (System with OMM + MI 12 or system with O-M-I)

Initiated by an M code generated by the program.

Probe switch-off

The probe is switched off by one of the following methods.

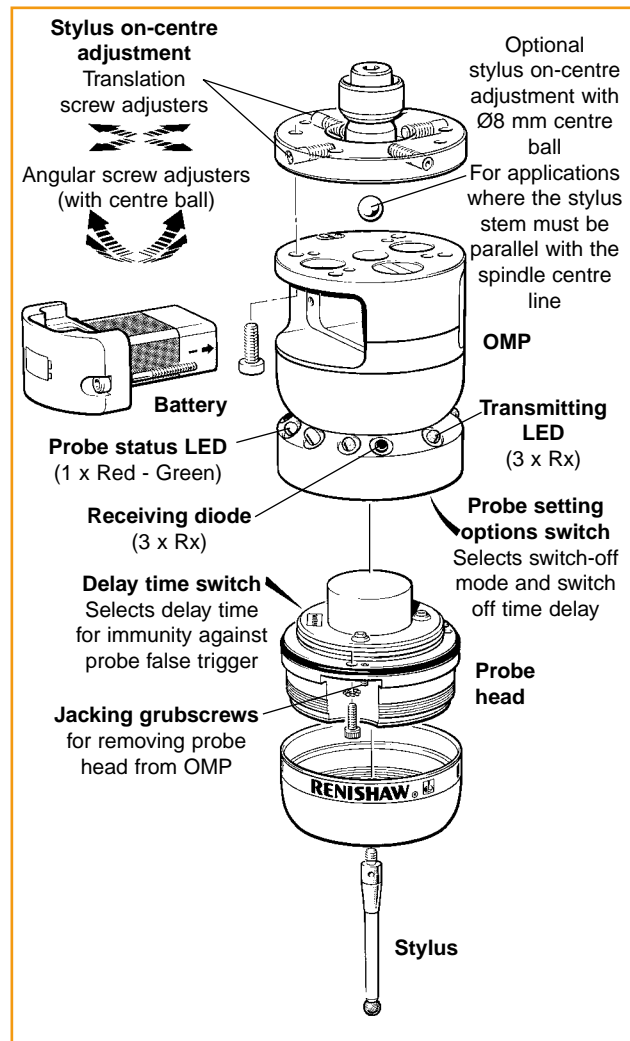
1. Optical-on – Optical-off (Factory set to this option)

A second start signal generated by a software M code, switches the probe to stand-by after 4.2 or 8.6 seconds.

2. Optical-on – Timer-out

A timer automatically returns the probe to stand-by if the probe has not been used for 33 seconds or 134 seconds.

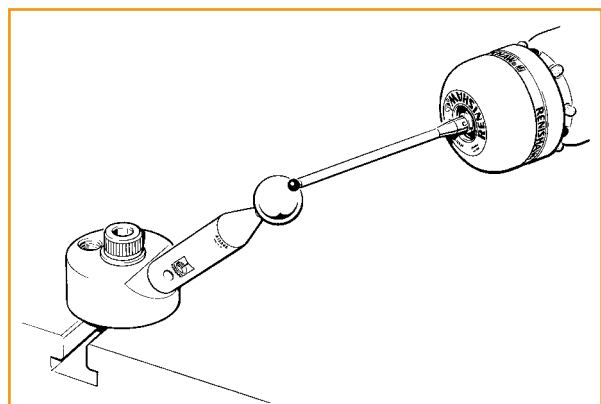
Probe features



Calibration sphere

The calibration sphere provides a means of datuming the MP700 probe, when used in conjunction with Renishaw software.

The calibration sphere is particularly effective when used on multi-axis machines, where the measurement of shape and form is a requirement.



Performance envelope

The MP700 has transmission envelope over the ranges shown below.

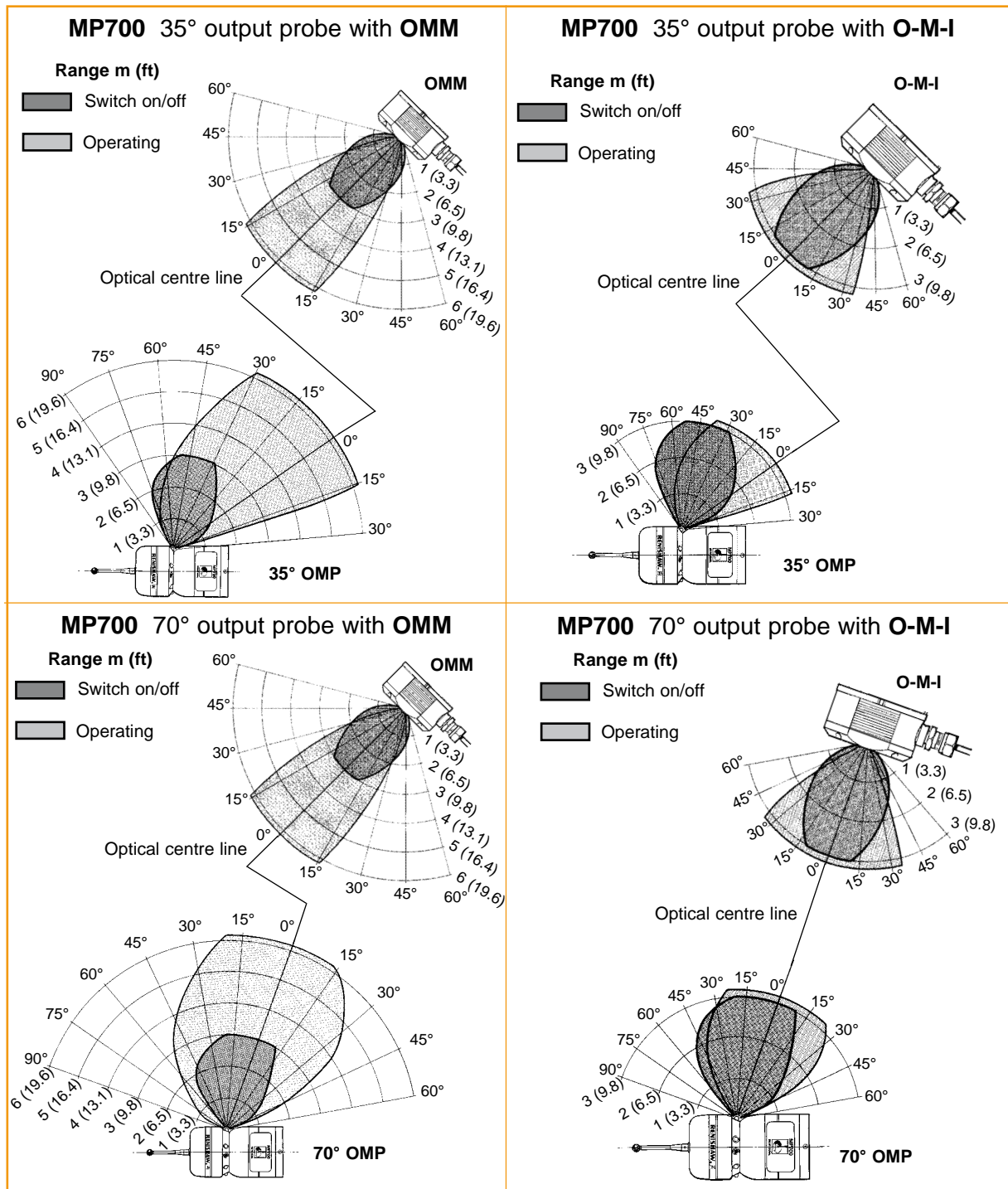
The probe system should be positioned such that the optimum range can be achieved over the full travel of the machine axis.

The OMP and OMM/O-M-I may deviate from the optical centre line, provided opposing light cones always overlap with transmitters and receivers mutually in each others field of view (eye to eye).

Natural reflective surfaces within the machine may increase the signal transmission range.

Coolant residue accumulating on the OMP LEDs and OMM/O-M-I window, will have a detrimental effect on transmission performance.

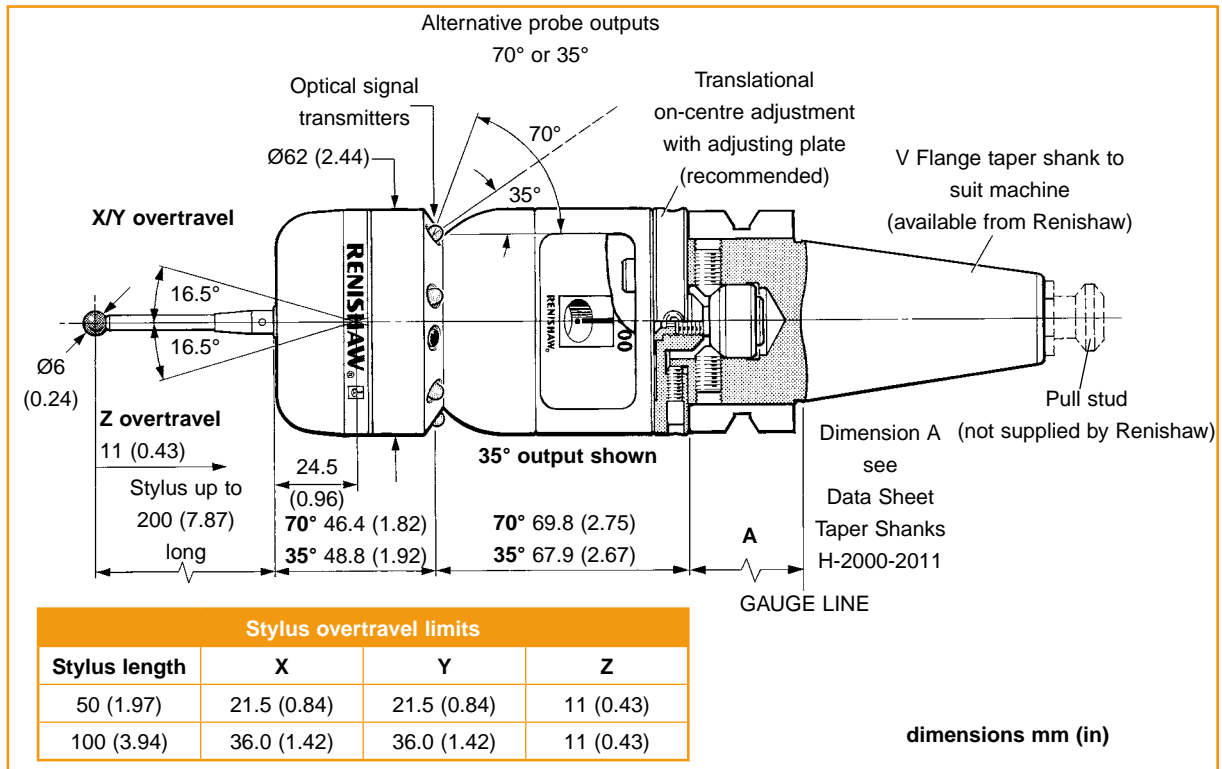
Wipe clean as often as is necessary to maintain unrestricted transmission.



Data sheet

MP700 probe with 360° optical transmission system

Dimensions



Specification

Primary application	Inspection probe for machining centres
Operating range	Up to 6 m (19.6 ft)
Weight	730 g (26.0 oz)
Sense directions	5-way
Repeatability, maximum	0.25 µm (10 µin) - 50 mm stylus length*
2σ value in any direction	0.35 µm (14 µin) - 100 mm stylus length*
X/Y 2D pre-travel variation	0.25 µm (10 µin) - 50 mm stylus length* 0.25 µm (10 µin) - 100 mm stylus length*
X/Y/Z 3D measuring performance (Variation from a true sphere)	1.00 µm (40 µin) - 50 mm stylus length* 1.75 µm (70 µin) - 100 mm stylus length*
Trigger speed range	30 mm/min (1.18 in/min) to 500 mm/min (19.68 in/min)
Stylus trigger force	
XY plane	0.19 N, 19 gf, (0.68 ozf) typical §
+Z direction	3.25 N, 325 gf, (11.69 ozf) typical §
Stylus overtravel force	
XY plane	1.8 N, 180 gf, (6.47 ozf) typical maximum†
+Z direction	14 N, 1400 gf, (50.36 ozf) typical maximum†
Stylus overtravel	
XY plane	16.5°
+Z direction	11 mm (0.43 in)
Sealing	IP68 (BS 5490, IEC 529) 1 atmosphere
Maximum recommended stylus length	200 mm (7.87 in)
Maximum number of triggers per second	3

* The specification applies to a test rig gauging speed of 240 mm/min (9.45 in/min) with zero time delay.

§ Performance specification is for a test velocity of 30 mm/min (1.18 in/min) with a 50 mm stylus and with the trigger filter delay set to 8 ms.




† Performance specification is with a 50 mm stylus.

Battery life

	Stand-by life		5% usage = 72 minutes (days-typical)				Continuous use (hours-typical)			
			Optical on Optical off		Optical on Timer off		Optical on Optical off		Optical on Timer off	
Battery type	Minimum	Typical	Minimum	Typical	Minimum	Typical	Minimum	Typical	Minimum	Typical
Alkaline Duracell MN 1604	286 days	381 days	25	36	23	34	30	43	28	41

Probe status LEDs

The probe status LED gives a visual indication of the probe state (triggered or seated). It also indicates when battery has become unusable.

LED colour	Probe status	Graphic hint
Flashing green	Probe seated in operating mode	
Flashing red	Probe triggered in operating mode	
Constant red	Battery dead (at this stage, probe status is forced open and the probe cycle will stop.)	

Renishaw plc
 New Mills, Wotton-under-Edge,
 Gloucestershire GL12 8JR
 United Kingdom

Parts list

Please quote the part number when ordering equipment

Type	Part number	Description
MP700 kit	A-2107-1035	MP700 35° probe with battery, stylus, OMM, MI 12 interface unit and tool kit.
MP700 kit	A-2107-1070	MP700 70° probe with battery, stylus, OMM, MI 12 interface unit and tool kit.
MP700 kit	A-2107-0013	MP700 35° probe with battery, stylus, O-M-I and tool kit.
MP700 kit	A-2107-0017	MP700 70° probe with battery, stylus, O-M-I and tool kit.
MP700	A-2107-0035	MP700 35° probe with battery.
MP700	A-2107-0070	MP700 70° probe with battery.
Battery	P-BT03-0001	PP3 9V alkaline battery.
Stylus	A-5003-1358	Carbon fibre stylus 100 mm long with Ø6 mm ball – this stylus is included in kits listed above.
Tool kit	A-2107-0040	Tool kit
Publications. These can be downloaded from our web site at www.renishaw.com		
Styli	H-1000-3200	Technical specification: styli and accessories.
Taper shanks	H-2000-2011	Data sheet: Taper shanks for machine tool probes.
OMM	H-2000-2275	Data sheet: OMM Optical module machine
MI 12	H-2000-2195	Data sheet: MI 12 interface unit
OMI	H-2000-2285	Data sheet: Optical machine interface
PSU3	H-2000-2200	Data sheet: PSU3 power supply unit (optional)
Calibration sphere	H-2000-2013	Data sheet: Renishaw calibration sphere
Software	H-2000-2289	Data sheet: Probe software for machine tools

Willrich Precision
866-945-5742
sales@willrich.com

**For worldwide contact details, please visit our
 main web site at www.renishaw.com/contact**



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