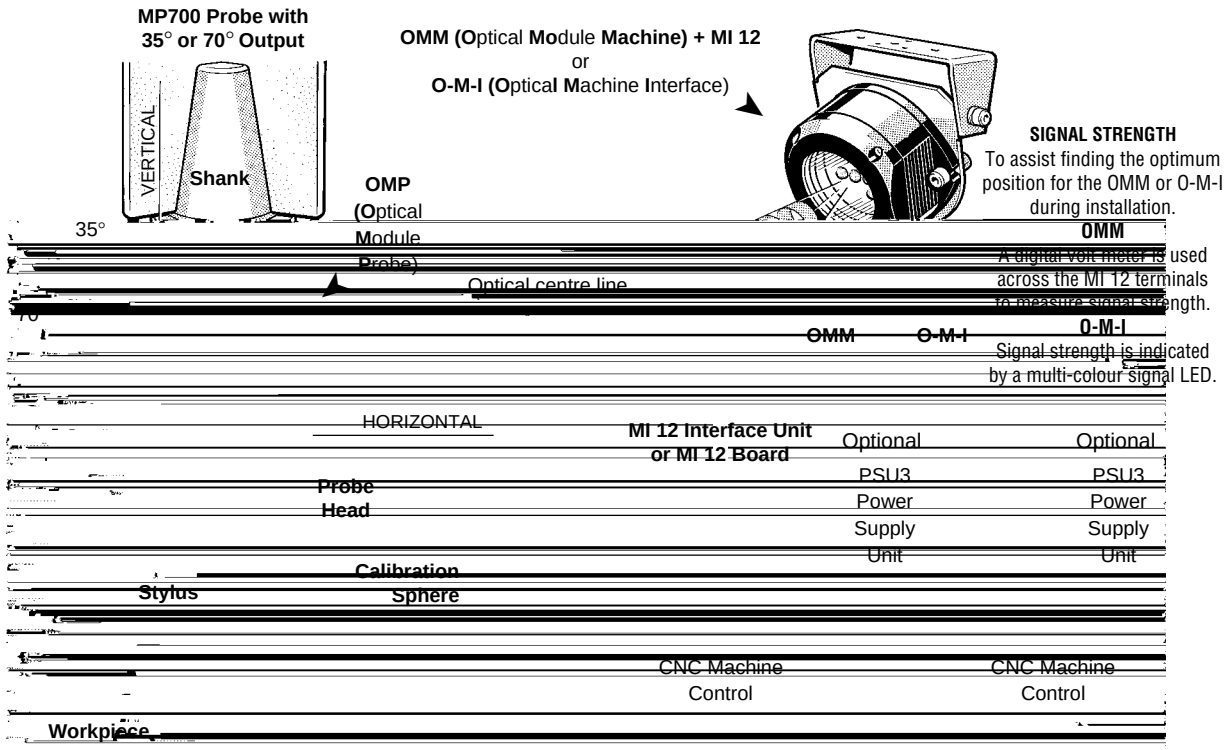
MP700 Probe with 360° Optical Transmission System

A high specification probe providing CMM type probe performance on CNC machine tools



MP700 ENHANCED PERFORMANCE

- ❑ **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 200mm (7.87in) long.
- ❑ **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 tough environment**
  Specifically designed for the machine tool environment, offering high resistance to shock and vibration.
- ❑ **High speed operation**
  The MP700 probe is protected against false trigger caused by machine vibration or rapid acceleration.

CALIBRATION SPHERE

- ❑ Used when datuming the MP700 Probe.

SYSTEM COMPONENTS

MP700 Probe
3D Touch Trigger Inspection Probe (±X, ±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 (**O**ptica**l** **M**odule **P**robe)
A transmitter/receiver module, containing optical signal LED's and a 9V battery, which powers probe operation.

OMM (Optical **M**odule **M**achine) **+ 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 (**O**ptical **M**achine **I**nterface)
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 24V supply is not available from the machine.

Probing Software
Renishaw probing software is available for most types of machine control.

Each system component is fully described on its own separate Data Sheet - please see Parts List on back page.

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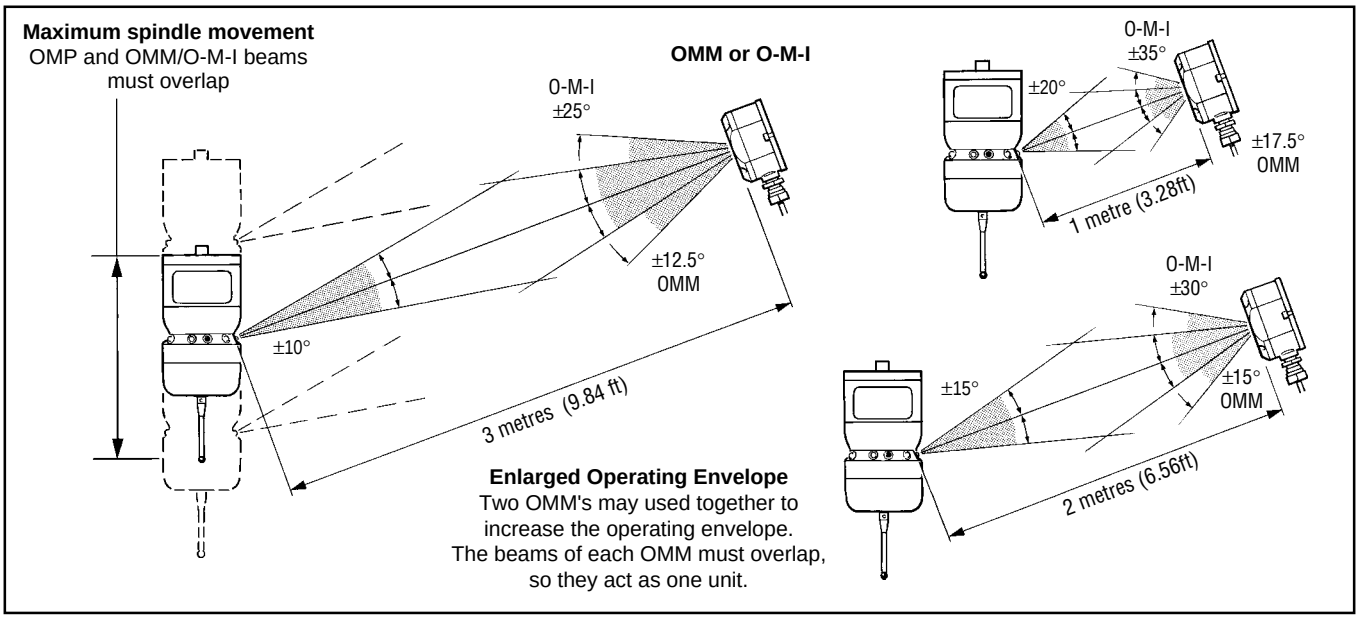
DATA SHEET

Installation - Probes with 35° or 70° Output



OPERATING RANGE

Minimum	10mm	(0.39in)
Maximum	3metres	(9.84ft)

OPERATING ENVELOPE

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.

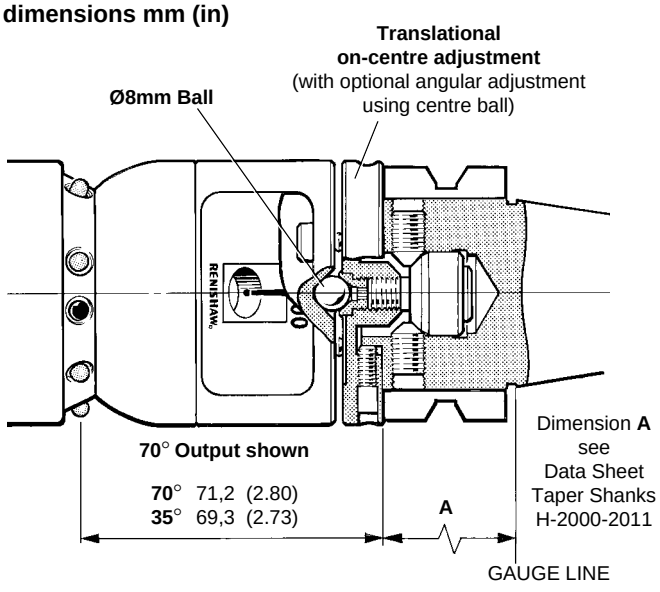
Coolant residue accumulating on the OMP LED's and OMM/O-M-I window, will have a detrimental effect on transmission performance.
Wipe clean as often as is necessary to maintain unrestricted transmission.

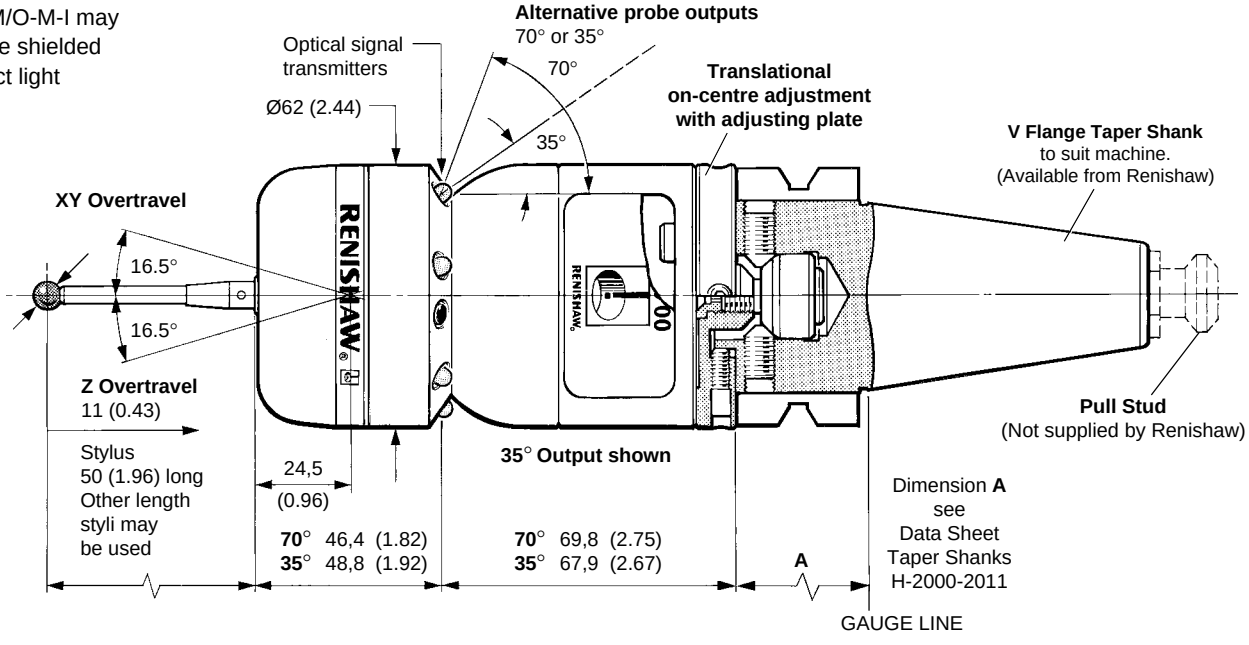
WARNING

If two systems are operating in close proximity to each other, take care to ensure that signals transmitted from the OMP on one machine, are not recieved by the OMM or O-M-I on the other machine, and vice versa.

The OMM/O-M-I may have to be shielded from direct light sources.

dimensions mm (in)





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 LED's (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.

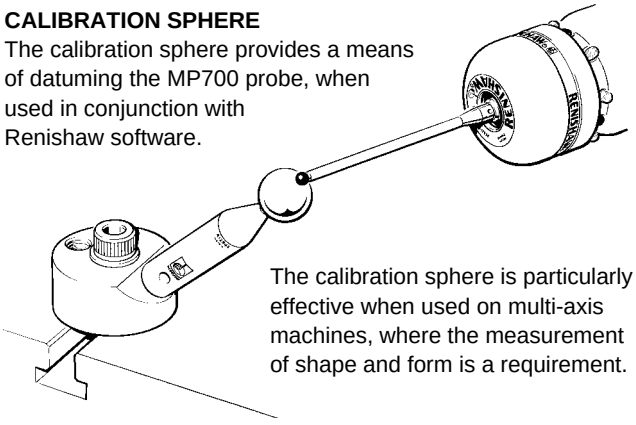
PROBE SWITCH-OFF

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 off.
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.

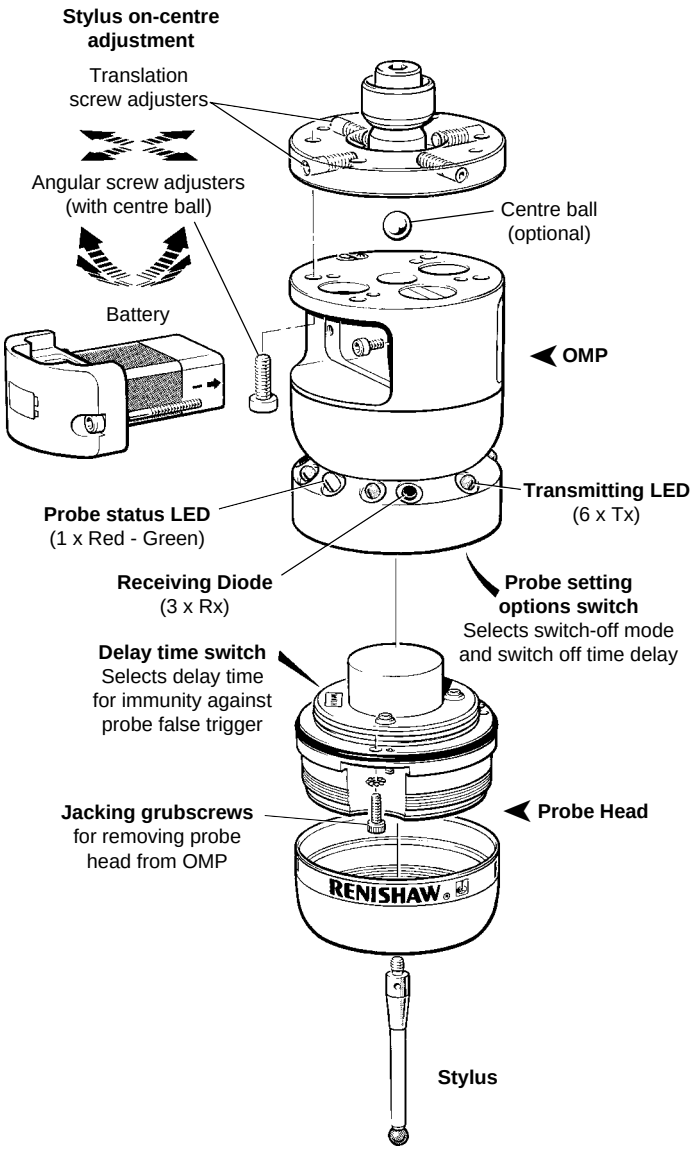
CALIBRATION SPHERE

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.

Probe Features



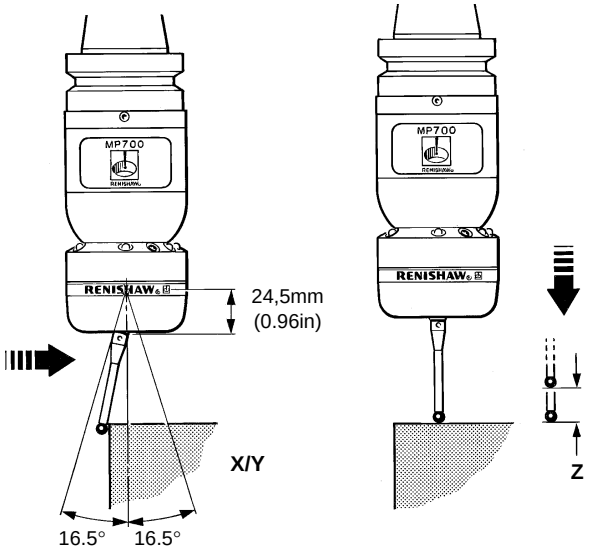
MP700 Probe Status LED The probe status LED gives a visual indication of the probe state (triggered or seated). It also indicates when battery has become unuseable.	
LED Colour	**Probe Status**
Flashing Green	Stylus seated
Flashing Red	Stylus deflected
Constant Red	Battery dead
Battery dead - At this stage probe status is forced open and the probe cycle will stop.	

BATTERY LIFE EXPECTANCY

	STAND-BY LIFE		5% USAGE - 72min/day				CONTINUOUS LIFE			
			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	381days	25 days	36 days	23 days	34 days	30 hrs	43 hrs	28 hrs	41 hrs

MP700 Probe Specification

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



Primary application	Inspection Probe for Machining Centres
Sense directions	5 Way
Trigger force using 50mm stylus	**X Y** 2gf (0.07oz) **Z** 15gf (0.53oz)
Overtravel force using 50mm stylus	**X Y** 40gf (1.41oz) **Z** 590gf (20.81oz)
Overtravel	**X Y** 16.5° **Z** 11mm (0.43in)
Maximum recommended stylus length	200mm (7.87in)
Recommended trigger speed	30mm/min (1.18in/min) to 500mm/min (19.68in/min)
Maximum number of triggers per second	3
Sealing	IP68 (BS 5490, IEC 529) 1 atmosphere

Stylus overtravel limits			
Stylus length	**X**	**Y**	**Z**
50mm (1.96in)	21,5mm (0.84in)	21,5mm (0.84in)	11mm (0.43in)
100mm (3.93in)	36,0mm (1.42in)	36,0mm (1.42in)	11mm (0.43in)

	50mm styli	**100mm styli**
Repeatability, maximum 2σ value in any direction	0,25µm (0.00001in)	0,35µm (0.000014in)
X,Y 2D Pre-travel Variation	±0,25µm (±0.00001in)	±0,25µm (±0.00001in)
X,Y,Z 3D Measuring Performance (Variation from a true sphere)	±1,0µm (±0.00004in)	±1,75µm (±0.00007in)

Parts List - Please quote the Part No. when ordering equipment

Type	Part No.	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-5000-3712	Ceramic Stylus 100mm long with Ø6 Ball - *This stylus is included in Kits listed above.*
Tool Kit	A-2107-0040	Tool Kit.
Styli - Standard M4	—	See Brochure **H-1000-3200** Styli and Accessories.
Shank	—	See Data Sheet **H-2000-2011** Taper Shanks.
OMM - Optical Module	—	See Data Sheet **H-2000-2275** Optical Module Machine.
MI 12 - Interface	—	See Data Sheet **H-2000-2195** MI 12 Interface Unit.
O-M-I - Optical Interface	—	See Data Sheet **H-2000-2285** Optical Machine Interface (Alternative to OMM + MI 12).
PSU3 - Power Supply	—	See Data Sheet **H-2000-2200** PSU3 Power Supply Unit (Optional).
Calibration Sphere	—	See Data Sheet **H-2000-2013** Renishaw Calibration Sphere.
Software	—	See Data Sheet **H-2000-2289** Probe Software for Machine Tools.

Renishaw reserves the right to change specifications without notice.

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