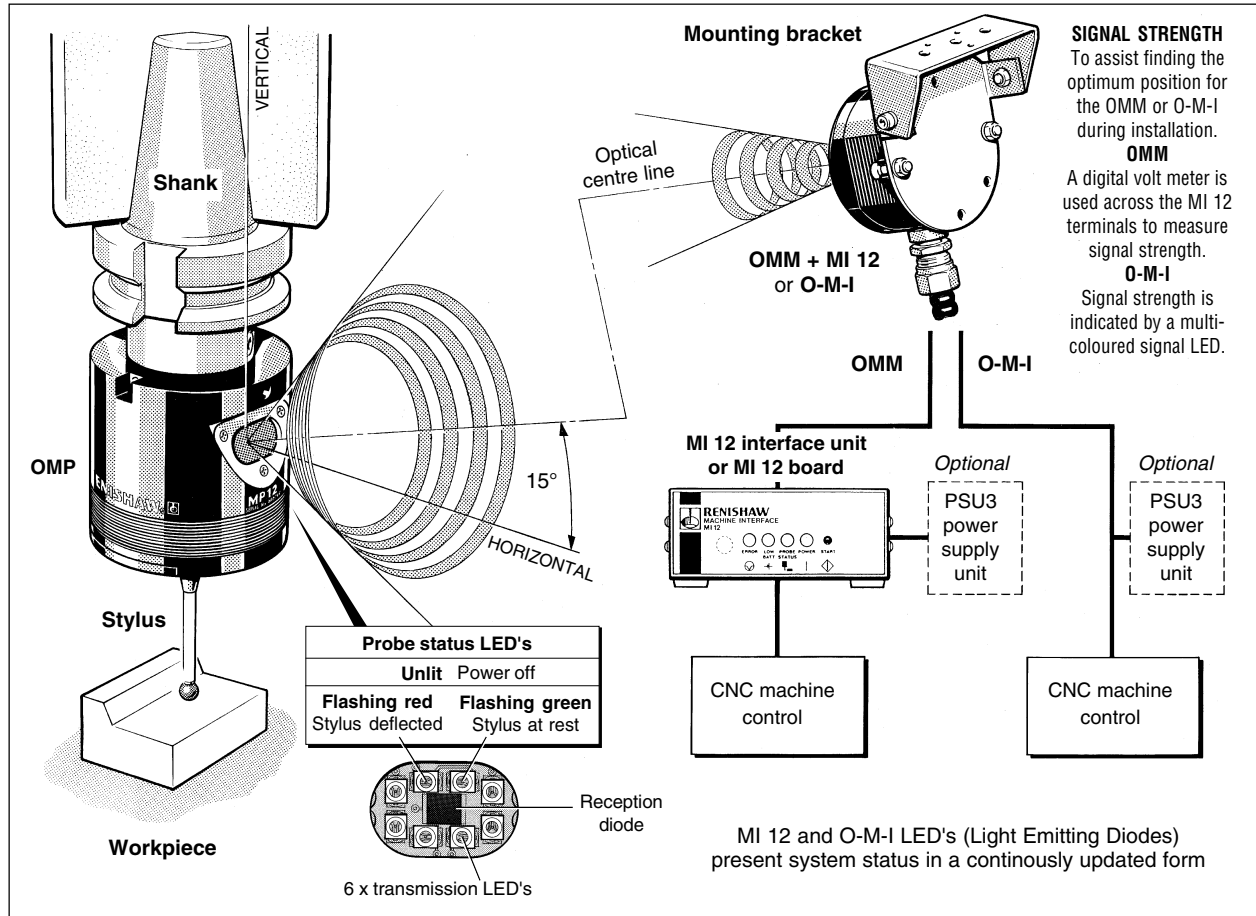


# MP12 probe system

Inspection probe with optical signal transmission for small machining centres



## MP12 FEATURES

The **MP12** is a 3D touch trigger inspection probe ( $\pm X$ ,  $\pm Y$ ,  $+Z$  sense directions), used for workpiece set-up and inspection on CNC machining centres.

Power for the probe is supplied by four AA batteries contained within the OMP (optical module probe). Battery life is typically 205 days (optical on/off) or 165 days (optical on/time out off) at 5% usage.

### OMP - OMM/O-M-I alignment.

The probe can be set through 360° to align with the OMM/O-M-I window. OMM/O-M-I transmission direction is set by adjusting the mounting bracket.

### Stylus on-centre adjustment.

Translational adjustment enables the centre of the stylus ball to be aligned with the spindle centre line.

## SYSTEM COMPONENTS

**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, combining the functions of both OMM and MI 12 in one unit.

### Probe, OMM and O-M-I sealing

Sealed to IPX8 and designed for reliable operation in the machine tool environment.

### PSU3 power supply unit for MI 12 or O-M-I

Used when 24V supply is not available from the machine.

### Software for probe routines

The MP12 is used with Renishaw single and double touch probing cycles.

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

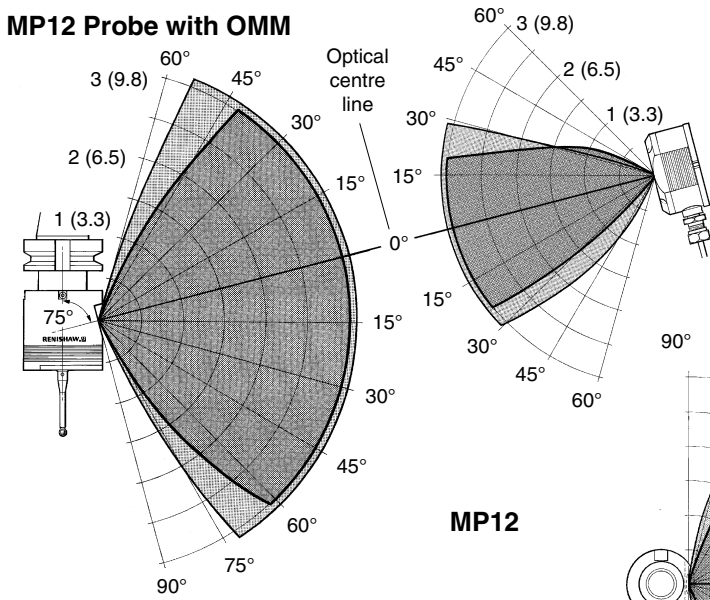
# RENISHAW

## DATA SHEET

# PERFORMANCE ENVELOPE

The MP12 is factory set to 100% signal transmission range.  
 A range setting switch will reduce transmission range to 50%, in the event  
 of signals on one machine interfering with signals on another machine.

## MP12 Probe with OMM

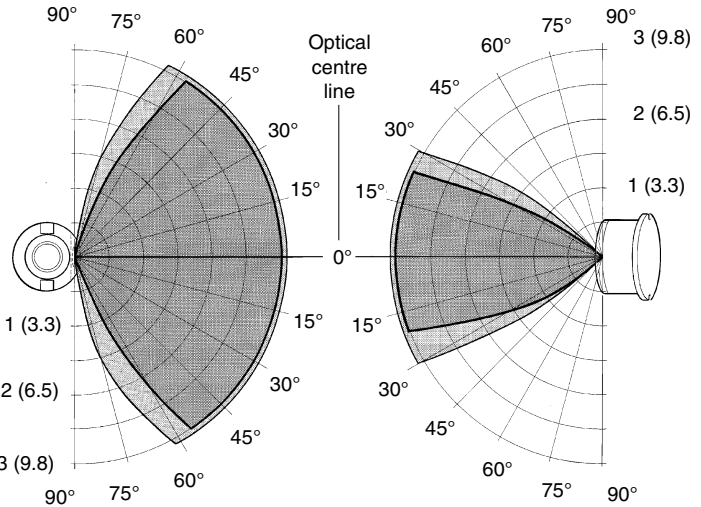


View from side  
XZ PLANE

## MP12

View from  
shank end  
XY PLANE

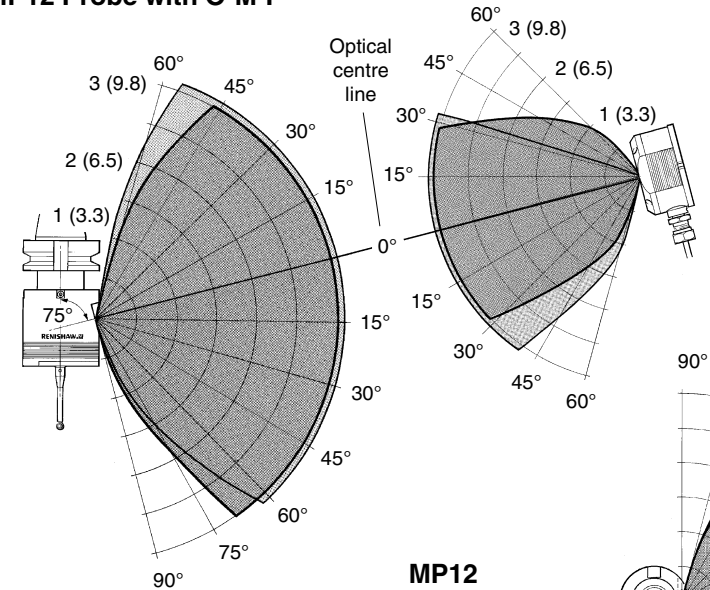
## OMM



### Range metres (feet)

- SWITCH ON/OFF
- OPERATING

## MP12 Probe with O-M-I

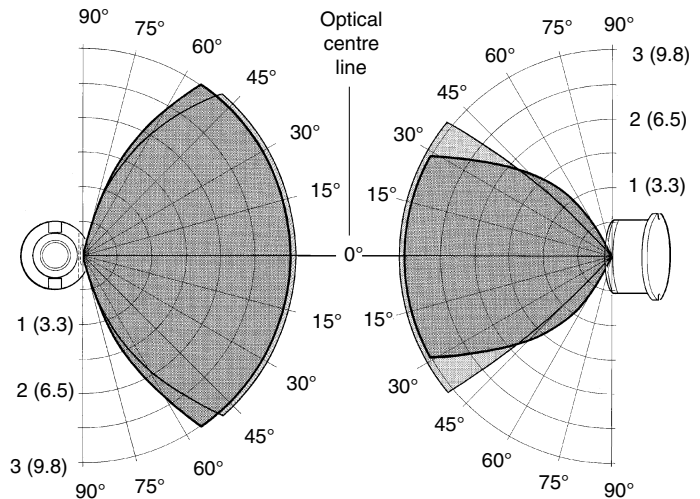


View from side  
XZ PLANE

## MP12

View from  
shank end  
XY PLANE

## O-M-I



## PERFORMANCE ENVELOPE

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

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

Operation in temperatures of 0° to 5°C (32° to 41°F) or 50° to 60°C (122° to 140°F) will result in some reduction in range.

The overhang of the tool changer gripper flange, may restrict the optical beam spread on some larger shanks.

Where systems are installed on multi-axis machines, care should be taken to ensure the probe LED's have line of sight to the OMM/O-M-I.

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 received by the OMM/O-M-I on the other machine, and vice versa. If required internal OMP/OMM/O-M-I switches can be set to reduce signal output power by 50%.

## MP12 OPERATION

The MP12 is either in stand-by or operating mode.

### 1. Stand-by mode

To conserve battery life, the OMP only uses a small current while waiting for the switch on signal.

### 2. Operating mode

To initiate an inspection routine, the probe is loaded into the machine spindle, then switch-on is commanded to activate the operating mode.

## SWITCH-ON on/off

MP12 switch on/off occurs when the MP12 has good battery life and is located in the machine spindle and is within the optical transmission envelope.

## SWITCH-ON options

1. **Manual start** (optical-on) - MI 12 start button.
2. **Machine start** (optical-on) - optical switch-on via software M code command - *factory set*.
3. **Auto start** (optical-on) causes the system to send an optical start signal once every second and does not require a machine control input.  
*Auto start must not be selected when the MP12 is set to the optical-on/optical-off option.*

## Note :

A start signal received during the time the probe is on, also resets the timer for a further 33 or 134 seconds on.

## SWITCH-OFF Options

1. **Optical-on and timer-off** (time out) - *factory set*.  
A timer switch automatically returns the probe to the stand-by mode after 33 or 134 seconds.  
*The timer is factory set to 134 seconds.*  
The 33 second option is selected by switching an internal probe switch.  
The timer is reset for a further 33 or 134 seconds on, each time the probe triggers during the operating mode.
2. **Optical-on and optical-off** *optional*  
Optical switch-off is commanded by a software M code.

## DEBOUNCE TIME *Optical-on and optical-off only*

When the probe is switched on, there is a 5 second delay, before it can be switched off. There is no delay before it can be switched back on, following switch off.

## ENHANCED TRIGGER CIRCUIT

Probes subjected to high levels of vibration or shock loads, may release spurious readings. The MP12 enhanced trigger circuit can be switched on to improve the probes resistance to these effects. When the circuit is enabled a constant nominal 7 millisecond delay is introduced to the probe output. It may be necessary to revise program software to allow for the increased stylus overtravel during the extended time delay.

## PROBE BATTERY LIFE

Four alkaline Duracell AA or equivalent

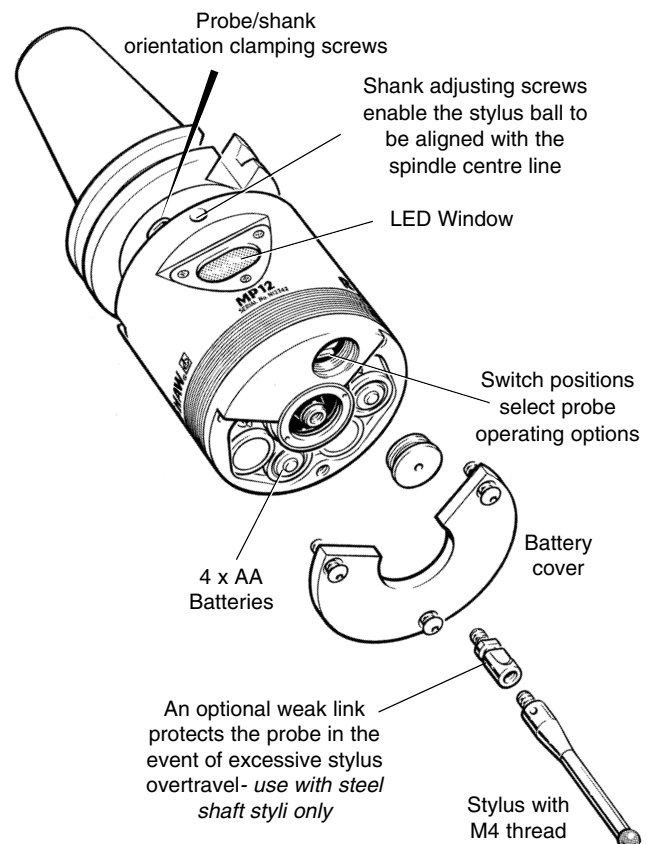
STAND-BY LIFE	5% USAGE - 72min/day		CONTINUOUS LIFE	
	OPTICAL ON-OFF	OPTICAL ON TIMER OFF	OPTICAL ON-OFF	OPTICAL ON TIMER OFF
Typical	Typical	Typical	Typical	Typical
471 days	205 days	165 days	425 hrs	300 hrs

An MI 12 interface or O-M-I low battery LED will warn users when the end of battery life is approaching. The machine control may also be programmed to flag up a low battery alarm.

## Typical battery reserve

Using an alkaline battery at 5% usage, the probe will typically continue to operate for 8 hours after the MI 12/O-M-I Low Battery LED lights up.

## MP12 FEATURES

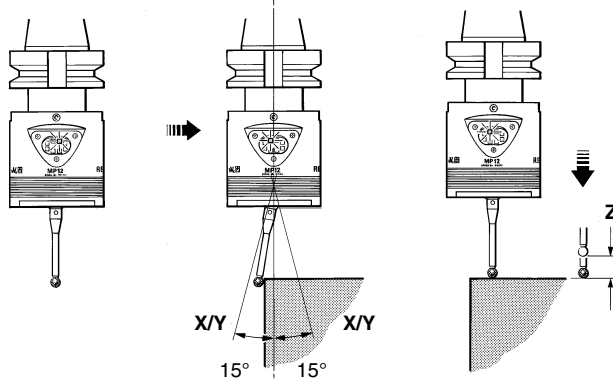


# MP12 Specification

dimensions mm (in)

Probe status LED flashing green

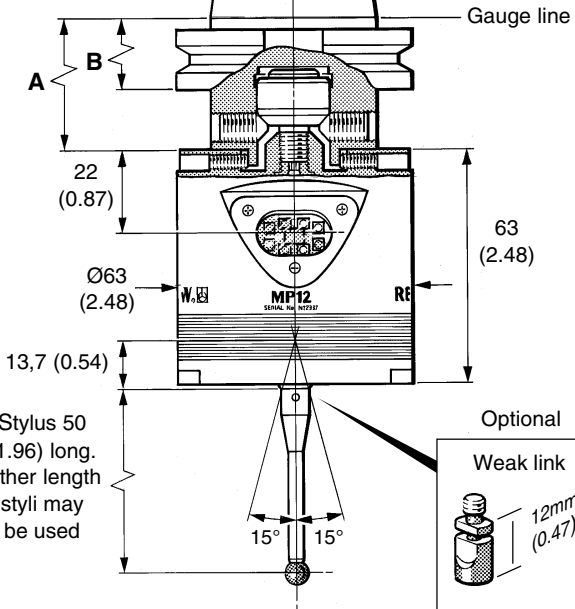
Probe status LED flashing red



Pull stud not supplied by Renishaw

Typical taper shank  
An extensive range of probe ready shanks is available from Renishaw  
Manufacturing details available on request

See Data Sheet Taper Shanks H-2000-2011 for dimensions A and B



Stylus overtravel limits			
Stylus length	X	Y	Z
50mm (1.96in)	17 (0.66)	17 (0.66)	11 (0.43)
100mm (3.93in)	30 (1.18)	30 (1.18)	11 (0.43)

### REPEATABILITY Max 2 sigma (2σ) value

Repeatability of 1,0μm (40μ in) is valid for stylus tip velocity of 480mm/min (1.57ft/min), using stylus 50mm (1.97in) long.

### STYLUS TRIGGER FORCE

Set at factory using stylus 50mm (1.97in) long.

X and Y trigger forces vary around the stylus seating.

X and Y direction - lowest force 0,65N / 65gf (2.29ozf)

X and Y direction - highest force 1,60N / 160gf (5.64ozf)

Z direction 12,00N / 1200gf (42.32ozf)

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

Type	Part No.	Description
MP12 + OMM + MI 12 kit	A-2075-0010	MP12 probe + batteries, stylus, OMM with mounting bracket, MI 12 and tool kit.
MP12 + OMM + MI 12-B kit	A-2075-0011	MP12 probe + batteries, stylus, OMM with mounting bracket, MI 12-board and tool kit.
MP12 + O-M-I kit	A-2115-0026	MP12 probe + batteries, stylus, O-M-I with mounting bracket and tool kit.
MP12	A-2075-0009	MP12 probe + batteries and tool kit.
Battery	P-BT03-0005	AA Battery - Duracell or equivalent (four required).
Tool kit	A-2075-0144	MP12 tool kit comprising stylus tool + 2mm, 2.5mm (two) and 4mm AF hexagon keys.
Diaphragm kit	A-2075-0015	DK12 probe outer diaphragm replacement kit.
Weak link kit	A-2085-0068	Weak link kit for steel shaft styli.
Stylus	A-5000-3709	Stylus Ø6 Ball x 50mm long with Ceramic Shaft.
Styli	—	See Brochure <b>H-1000-3200</b> Renishaw styli guide.
Shank	—	See Data Sheet <b>H-2000-2011</b> Taper shanks.
OMM - optical module	—	See Data Sheet <b>H-2000-2275</b> Optical module machine (used with MI 12).
MI 12 - interface	—	See Data Sheet <b>H-2000-2195</b> MI 12 interface unit.
O-M-I - optical interface	—	See Data Sheet <b>H-2000-2285</b> Optical machine interface (alternative to OMM + MI 12).
PSU3 - power supply	—	See Data Sheet <b>H-2000-2200</b> PSU3 power supply unit (optional).
Software	—	See Data Sheet <b>H-2000-2289</b> Probe software for machine tools.

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