**Installation and user's guide**
H-2000-5022-05-A

RENISHAW
apply innovation™

# OMP40

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Renishaw part no: H-2000-5022-05-A

Issued: 06 2006

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**Patent notice**

Features of OMP40 probes and features of similar probes are the subject of one or more of the following patents and/or patent applications:

EP 0,695,926 EP 0,390,342 EP 0,974,208
EP 1,130,557 EP 1,397,637 EP 1,373,995
EP 1,185,838 EP 1,477,767 EP 1,477,768
US 5,669,151 US 5,040,931 US 5,212,872
US 6,472,981 US 6,776,344 US 6,860,026
US 6,839,563 US 2002-219,886
US 2003-0,179,097
JP 2,945,709 JP 2001-53,062
JP 2003-526,170 JP 2004-522,961
JP 2004-530,234 JP 2001-520,844

CE

**EC DECLARATION OF CONFORMITY**

Renishaw plc declares that the product:

| **Name** | **Description** |
|---|---|
| OMP40 | Optical machine probe |

has been manufactured in conformity with the following standards:

| | |
|---|---|
| BS EN 61326: 1998/ A1:1998/A2:2001 | Electrical equipment for measurement, control and laboratory use - EMC requirements. Immunity to annex A - industrial locations. Emissions to class A (non-domestic) limits. |

and that it complies with the requirements of the following directives (as amended):

| | |
|---|---|
| 89/336/EEC | Electromagnetic compatibility |

The above information is summarised from the full EC Declaration of Conformity. A copy is available from Renishaw on request.

# FCC

**Information to user (FCC Section 15.19)**

This device complies with Part 15 of the FCC rules. Operation is subject to the following conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

**Information to user (FCC Section 15.105)**

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with this installation guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case you will be required to correct the interference at your own expense.

**Information to user (FCC Section 15.21)**

The user is cautioned that any changes or modifications not expressly approved by Renishaw plc or authorised representative could void the user's authority to operate the equipment.

### Safety

Only qualified persons should change the switch settings or replace fuses.

Where appropriate, remove the mains supply from units before removing covers.

### Warranty

Equipment requiring attention under warranty must be returned to your supplier. No claims will be considered where Renishaw equipment has been misused, or repairs or adjustments have been attempted by unauthorised persons.

### Changes to equipment

Renishaw reserves the right to change specifications without notice.

### CNC machine

CNC machine tools must always be operated by competent persons in accordance with the manufacturer's instructions.

### Care of the probe

Keep system components clean and treat the probe as a precision tool.

### Probe IP rating

IPX8

### Related publications

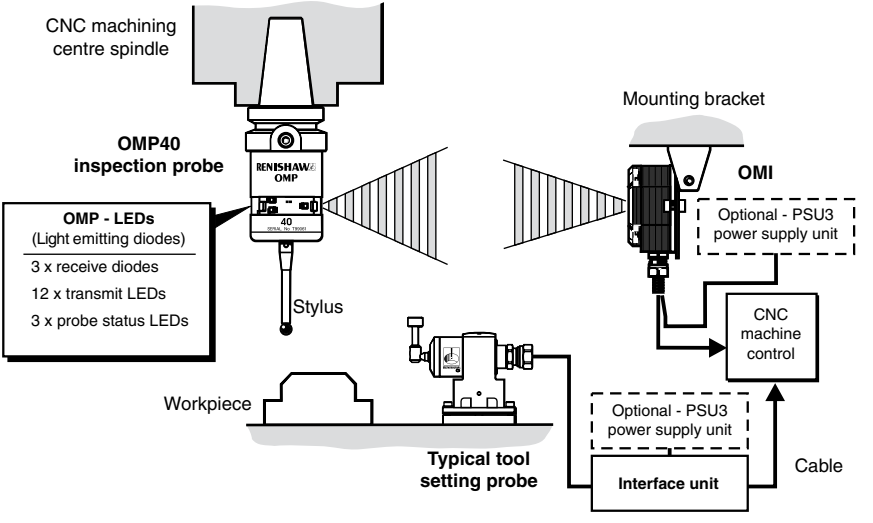
When you install the OMP40 probe system, you will also need to refer to one or more of the publications listed below for details of how to install the ancillary equipment.

- Optical module machine (OMM) installation and user's guide – Renishaw part No. H-2000-5044.
- MI 12 interface unit installation and user's guide – Renishaw part No. H-2000-5073.
- Optical machine interface (OMI) installation and user's guide – Renishaw part No. H-2000-5062.
- PSU3 power supply unit installation and user's guide – Renishaw part No. H-2000-5057.

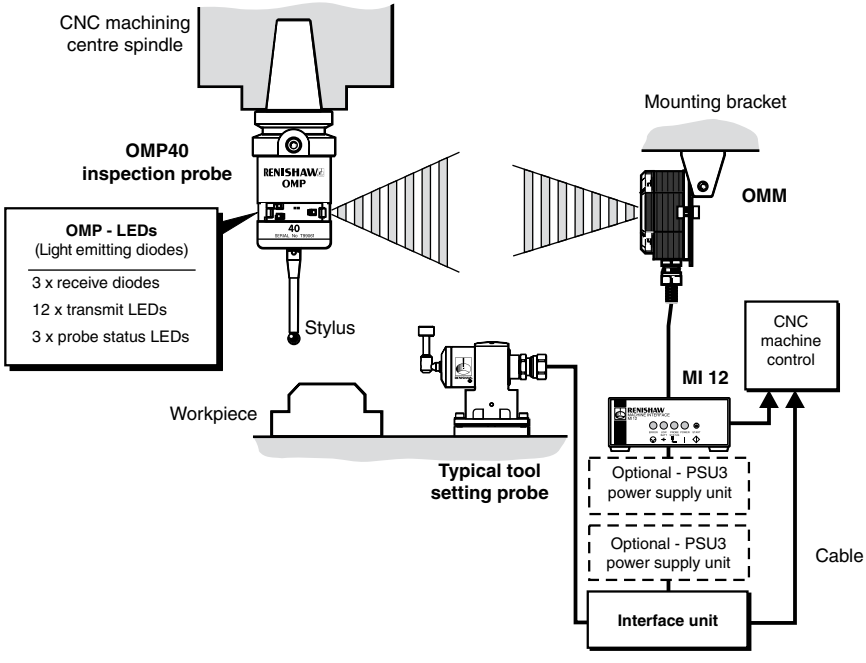
# Typical probe system using OMI

A workpiece set-up and inspection probe is, in effect, another tool in the system. A probe cycle may be included at any stage of the machining process.

Signals are transmitted between the probe and the machine's control, via the OMI or alternatively the OMM + MI 12. Interface units convert probe signals into an acceptable form for the machine's control.



# Typical probe system using OMM and MI 12



# Twin OMMs and remote indicator using MI 12

### Twin OMM mounting

On large machine tools it is possible to provide greater reception coverage by mounting two OMMs connected to a single MI 12.

### Remote indicator

The MI 12 interface contains an LED and acoustic indicator. When the probe is triggered the LED will change state and a beep is emitted.

If the MI 12 is hidden from the operator, a remote lamp or bleeper may be placed in a position where it is easily seen or heard.

**Battery specification**

The probe requires two ½ AA size Lithium Thionyl Chloride batteries, individually rated at a voltage of 3.6 V. It is important that the batteries are supplied in *standard* (*button)* form; batteries described as *tagged* will have additional connection tag features fitted to the terminals and are not suitable.

**Recommended batteries:**

**Ecocel:** EB 1425, EB 1426
**Saft:** LS 14250 C, LS 14250
**Sonnenschein:** SL-750
**Xeno:** XL-050F

**Unsuitable batteries (due to OMP40 power requirements):**

**Dubilier:** SB-AA02
**Maxell:** ER3S
**Sanyo:** CR 14250 SE
**Sonnenschein:** SL-350, SL-550
**Tadiran:** TL-4902 TL-5902, TL-2150, TL-5101
**Varta:** CR 1/2 AA

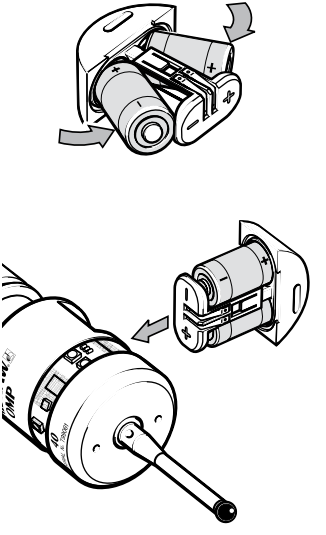
**Battery life**

| Stand-by life | | 5% usage - 72 minutes/day | | Continuous use | |
|---|---|---|---|---|---|
| Typical (days) | | Typical (days) | | Typical (hours) | |
| Standard power mode | Low power mode | Standard power mode | Low power mode | Standard power mode | Low power mode |
| 1900 | 1900 | 115 | 175 | 140 | 210 |

# Installing the batteries

**Step 1: Unlock the battery cassette**


**Step 2: Insert the batteries**



**Step 3: Lock the battery cassette**

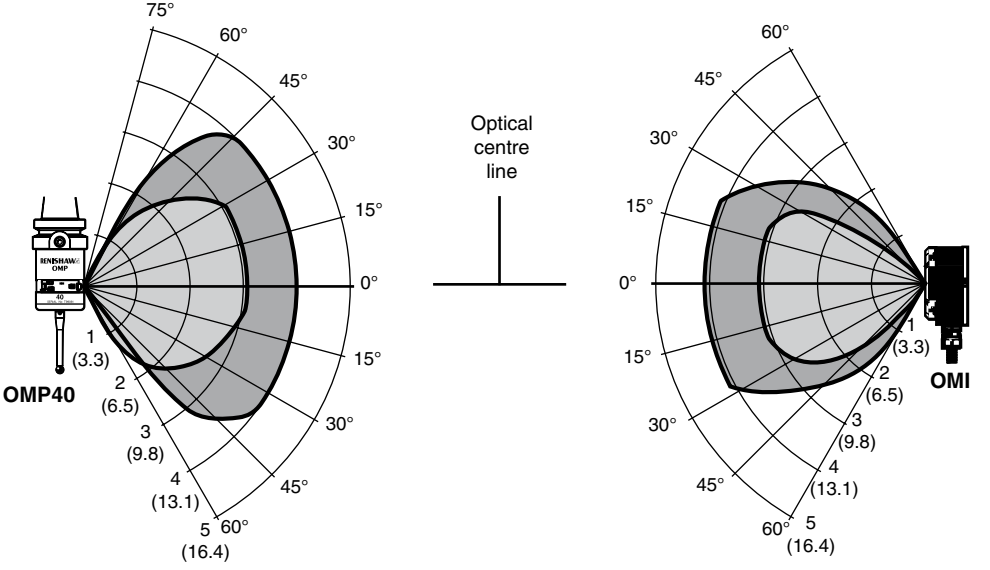
# Performance envelope with OMI

**OMP40 probe + OMI**

Probe and OMI diodes must be in the other's field of view, and within the performance envelope shown.

**360° range** metres (feet)

SWITCH ON/OFF OPERATING



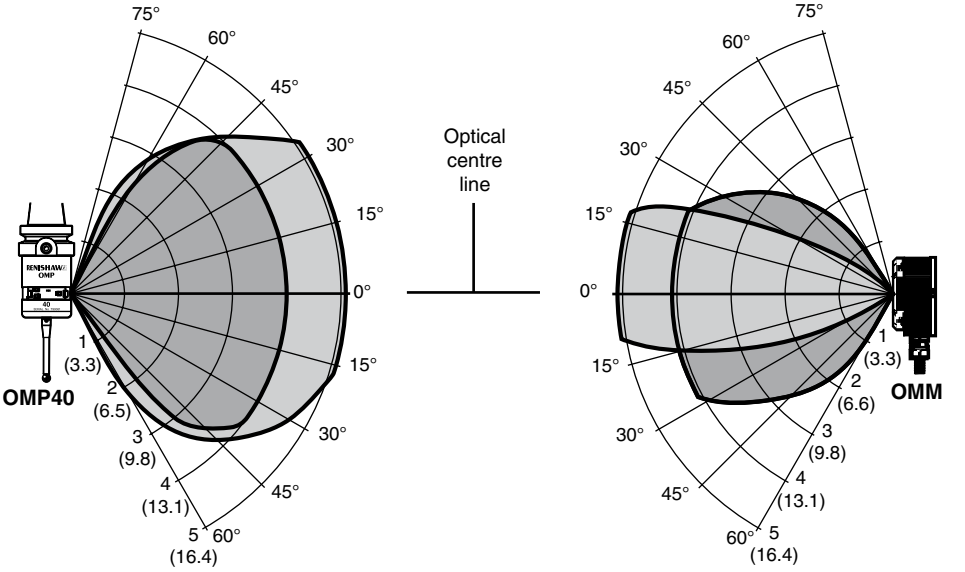
# Performance envelope with OMM

**OMP40 probe + OMM**

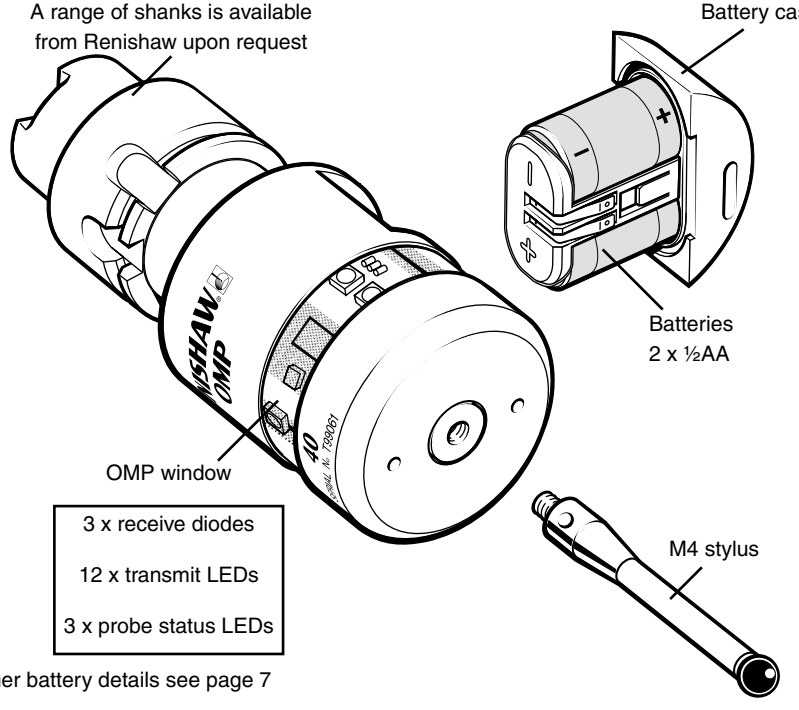
Probe and OMM diodes must be in the other's field of view, and within the performance envelope shown.

**360° range** metres (feet)

SWITCH ON/OFF OPERATING



# OMP40 features




For further battery details see page 7

# OMP40 and system performance

**Operating envelope**

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

Coolant residue accumulating on the OMP, OMM and OMI windows, will have a detrimental effect on transmission performance. Wipe clean as often as is necessary to maintain unrestricted transmission.

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

**Warning**

If two systems are operating in close proximity, take care to ensure that signals transmitted from the OMP on one machine, are not received by the OMM or OMI on the other machine, and vice versa.

When this is the case, use of the probe's low power mode, or OMM and OMI low range setting is recommended (see page 30).

**OMM and OMI position**

To assist in finding the optimum position of the OMM during system installation, signal strength outputs are available on the MI 12 interface.

OMI signal strength is displayed on an OMI multi-coloured LED.

**Collision protection devices**
Only ceramic styli are recommended for use with OMP40. OMP40 is not compatible with any stylus 'weak link' protection devices, except when fitted after a stylus extension.

**Environment**

| Probe/OMP OMM<br>MI 12 interface<br>OMI PSU3 | Temperature |
|---|---|
| **Storage** | -10 °C to 70 °C<br>(14 °F to 158 °F) |
| **Normal operating** | 5 °C to 50 °C<br>(41 °F to 122 °F) |

**Probe repeatability**

Maximum 2 Sigma ($2\sigma$) Value;

Repeatability of 1.0 µm (0.00004 in) is valid for test velocity of 480 mm/min (1.57 ft/min) at stylus tip, using stylus 50 mm (1.97 in) long.

**Stylus trigger force**

X/Y trigger forces vary around the stylus seating.

X/Y direction - typical lowest force 0.50 N / 50 gf (1.76 ozf)

X/Y direction - typical highest force 0.9 N / 90 gf (3.17 ozf)

Z direction - 5.85 N / 585 gf (20.62 ozf)

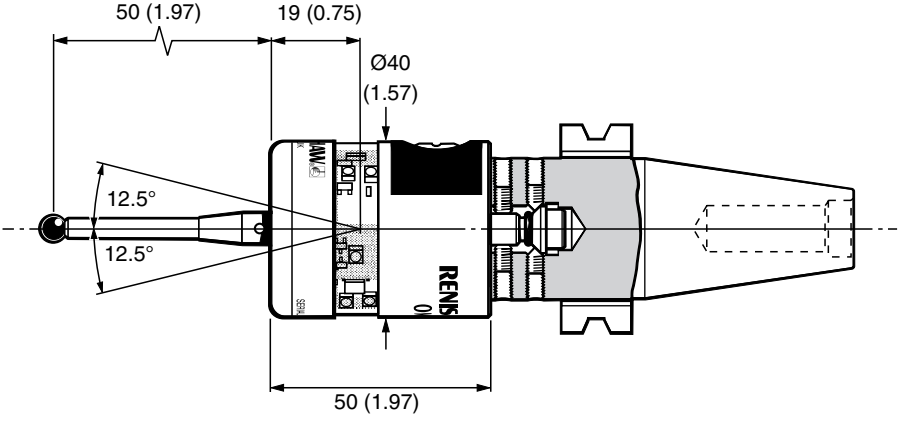
**Probe IP rating** IPX8

**Probe weight** *without shank*

| | | |
|---|---|---|
| OMP40 probe | without batteries | 242 g (8.53 oz) |
| OMP40 probe | with batteries | 262 g (9.24 oz) |

# OMP40 dimensions

**dimensions mm (in)**




Probe-ready shanks available from Renishaw.

# Probe/shank mounting

Stylus alignment with the spindle's centre line need only be approximate, except in the following circumstances.

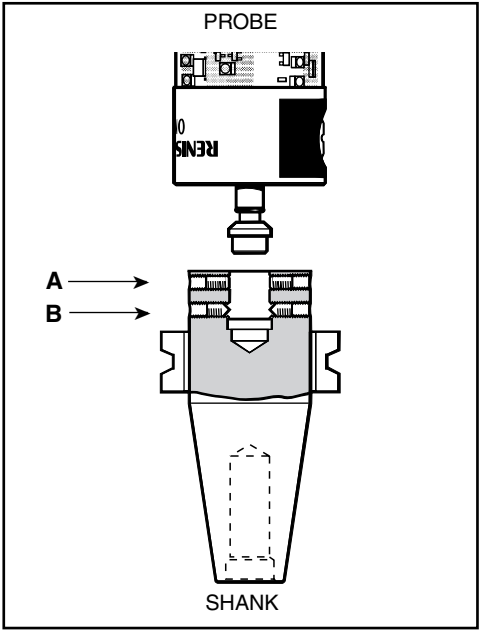
1. When probe vector software is used.
2. When the machine control software cannot compensate for an offset stylus.

**How to check stylus position**

Stylus tip and stem position are established using a low force (less than 20 g [0.71 oz]) dial test indicator or setting gauge. Alternatively, rotate the stylus ball against a flat surface. Alignment is good when the stylus ball maintains a consistent distance from the flat surface.

**Stage 1 - Probe/shank mounting**

1. Fully slacken screws **A**. Then grease screws **B**, and fit to shank.
2. Fit the probe onto the shank, and visually position the probe centrally relative to the shank. Partially tighten screws **B** to 1 Nm (0.23 lbf).
3. Fit the probe/shank assembly into the machine spindle.



# Stylus on-centre adjustment

**Stage 2 - Adjustment**

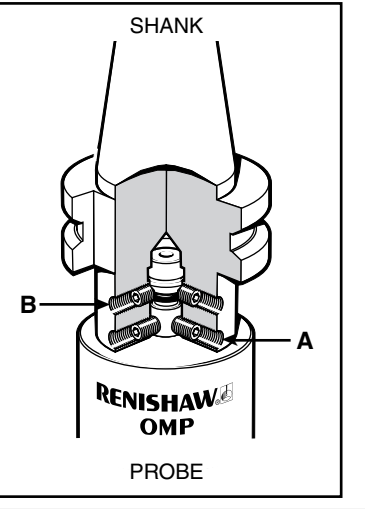
4. There are four screws **A**. Each will move the probe relative to the shank, in the X or Y direction as pressure is applied. Tighten individually, backing off after each movement.

5. When centering with screws **A**, progressively tighten as the final setting is approached. Slackening on one side and tightening the opposite screw, in sequence.

6. When the stylus tip run-out is less than 20 µm (0.0008 in), fully tighten screws **B** to max 2.2 Nm (0.49 lbf), and use screws **A** in opposition to move the probe at the same time. Use two hexagonal keys if necessary.

   Tip run out of 5 µm (0.0002 in) should be achievable.

7. It is important that all four screws **A** are tight or tightened to a maximum of 2.2 Nm (0.49 lbf) once the final setting has been achieved.

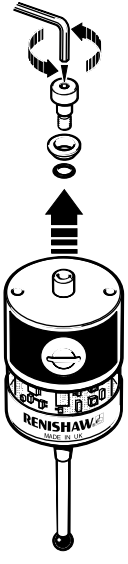



**Notes :** During adjustment, care should be taken not to rotate the probe relative to the shank.

If a probe/shank unit is accidentally dropped, it should be checked for on-centre position.

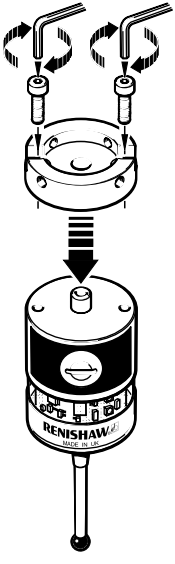
Do not hit or tap the probe to achieve on-centre adjustment.

# Shank adaptor assembly (optional)



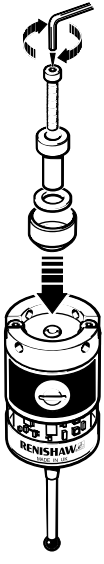

1. Remove.

3 Nm (0.68 lbf)

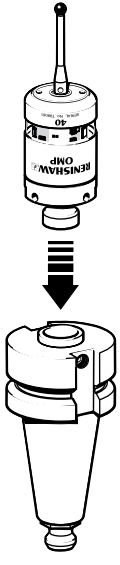



2. Mount adaptor plate.

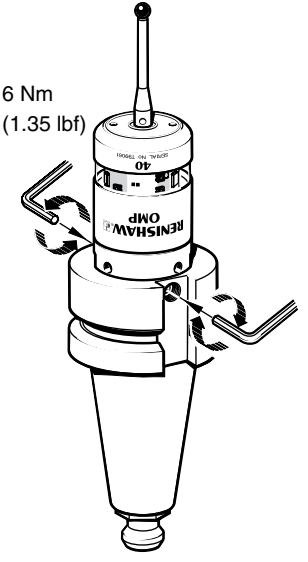
3 Nm (0.68 lbf)



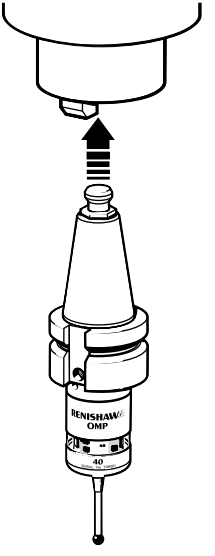

3. Grease and assemble adaptor.



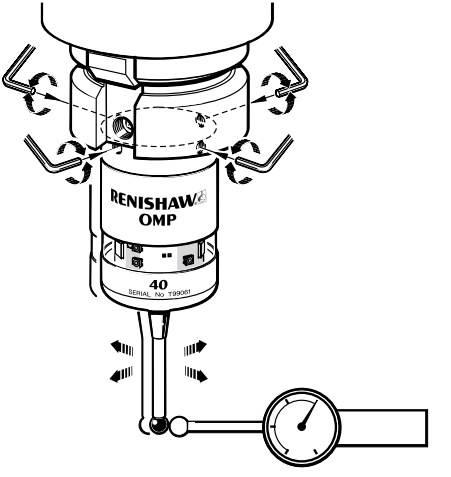

4. Fit to shank.




5. Fully tighten




6. Fit to spindle




7. Screw in opposition to adjust runout <5 µm. Fully tighten to 2.2 Nm (0.49 lbf) when complete.

# Probe moves

**Probe trigger**

A probe trigger signal is generated when the probe's stylus is driven against a surface. The machine's control records the contact position and instructs machine motion to stop.

To ensure a trigger signal, drive the probe against the workpiece to a target beyond the expected surface, but within the limits of stylus overtravel. After the probe's stylus touches the surface, reverse clear of the surface.

**Single and double touch probing**

If the probe operating sequence is based on a single touch, then the probe is returned to its start point following a measuring move.

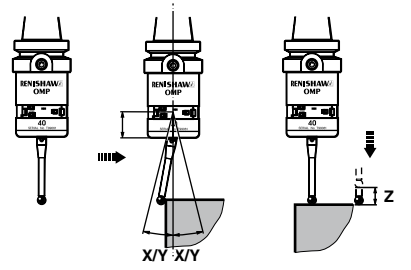
On some types of controller, it is desirable to use a two touch method, as poor accuracy and repeatability can result at higher feed rates.

With a double touch sequence, the first move finds the surface quickly. The probe is then backed off to a position clear of the surface before making the second touch at a slower feed rate. This records the surface position at a higher resolution.

**Probe measuring speed**

The probe system's transmission delay time is small and constant. Normally, it does not limit the probing speed because it is cancelled out during calibration of the probe on the machine tool.

High probing speeds are desirable. However, if used, a probing velocity must be chosen which allows the machine to stop within the limits of stylus overtravel and the measuring capabilities of the machine.




Probing cycles are available from Renishaw

**Calibrating a system**

Calibration should be done in the following circumstances:

- Before the system is used.
- When a new stylus is used.
- To allow for machine thermal growth.
- Poor relocation repeatability of the probe holder.

It is important that calibration cycles are run at the measuring cycle feedrate to cancel out system errors.

Make measurements in every measuring direction to provide complete calibration data for the measuring cycles.

**Probe interface signals**

**1. Error signal delay**

A delay of 48 ms maximum for the OMM + MI 12 or 41 ms maximum for the OMI, will elapse between an error occurring and the output indicating error.

**2. Probe signal delay**

There is a nominal delay of 240 µs with a repeatability of 3 µs for each interface, from the time the probe actually operates, to the MI 12/OMI interface outputting a probe change of state.

Enabling the enhanced trigger circuit will add a further nominal 10 ms.

# Software requirements

Probe cycles and features are machine software dependant and should allow the following functions.

- Simple to use cycles.
- Update a tool offset.
- If an out of tolerance is found, either generate an alarm stop, or set a flag for corrective action.
- Update work co-ordinate systems for positioning.
- Report measured sizes and update tool offsets for automatic tool offset compensations.
- Print data in the form of an inspection report to an external PC/printer.
- Set tolerances on features.

**Verify your software**

1. Does your software have suitable calibration routines which compensate for stylus on-centre errors? If not, you must set the probe stylus on-centre mechanically.

**Note: Machining centre applications.**
When using probe styli which are not on spindle centre, spindle orientation repeatability is important to avoid probe measurement errors.

2. Does your software compensate for probe triggering characteristics in all measuring directions?

3. Does the software automatically adjust the program co-ordinate system to the relevant set-up feature on the component, for job set-up purposes?

4. Does your software provide protected moves in the cycles to monitor for a collision?

**Inspection cycle features**

**Simple to use canned cycles for standard features :**

Bore/boss.

Web/pocket.

Single surface.

**Simple to use canned cycles for optional features :**

Angle measurement.

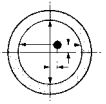
Vector 3 point bore/boss.

Vector single surface.

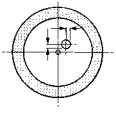
# Typical probe cycles for machining centres

Simple to use canned cycles for basic features

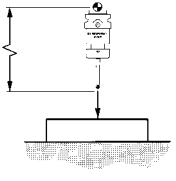
**Inspection probe calibration**
Probe XY offset calibration



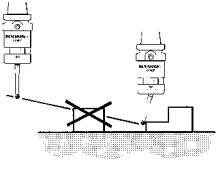
Stylus ball radius calibration



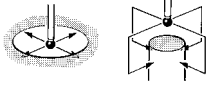
Probe length calibration



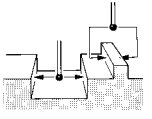
**Inspection probe collision protection**



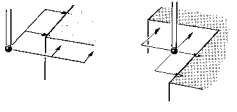
**Inspection**
Bore and boss measure



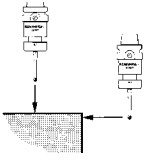
Web and pocket measure



Internal and external corner find



XYZ single surface position



Inspection print-out

**COMPONENT No. 1**

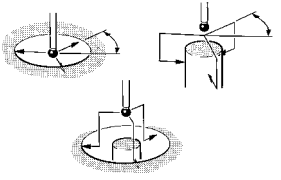
| OFFSET NO. | NOMINAL DIMENSION | TOLERANCE | DEVIATION FROM NOMINAL | COMMENTS |
|---|---|---|---|---|
| 99 | 1.5000 | .1000 | .0105 | |
| 97 | 200.0000 | .1000 | .2054 | OUT OF TOL |

# Typical probe cycles for machining centres

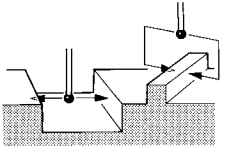
Simple to use canned cycles for additional features

**Inspection**

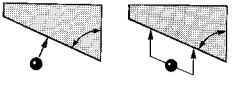
Bore and boss (three point)



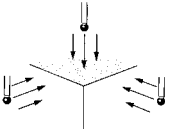
Angled web and pocket measure



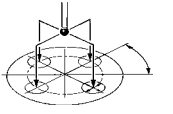
Angled surface measure



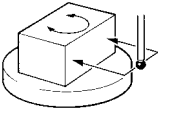
Stock allowance



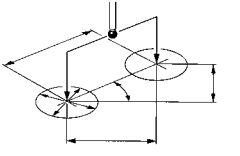
Bore and boss on PCD



4th axis measure



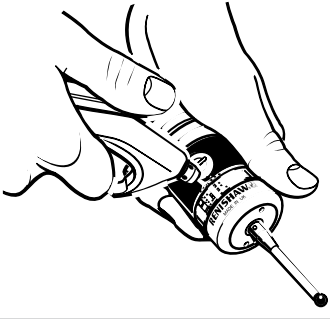
Feature-to-feature measure



Macro software for use with the OMP40 is available from Renishaw for the majority of major controller types. Information is available on request.

# Replacing batteries

Clean and dry the probe with a cloth or paper towel before removing the battery cassette. Where the probe has been exposed to coolant, it is recommended that the area around the battery cassette is cleaned using an airline.



**CAUTION:** Appropriate precautions must be taken when using airlines, in accordance with local regulations.
Always wear eye protection.
Never direct the flow at yourself or others.

**CAUTION:** DO NOT leave exhausted batteries in probe.
DO NOT allow coolant or debris to enter the battery compartment.
DO check correct battery polarity.

To access the probe‘s batteries, remove the battery cassette by rotating the securing screw 45° anticlockwise (see page 8).

Take care to avoid damaging the cover gasket.

When inserting the batteries, ensure they are loaded as shown (see page 8).

**Take care to read the battery label as polarities are not common across manufacturers.**

The probe is protected against incorrect loading which would result in reversed polarity. If one or more batteries are incorrectly loaded, the probe will not respond.

Do not mix new and used batteries as this will result in reduced life and damage to the batteries.

Always ensure that the cover gasket and mating surfaces are clean and free from damage before reassembly.

**Low battery indicators**

The low battery warning will be signalled by the alternate flashing of the blue probe status LED, indicating that the end of the usable battery life is approaching. Simultaneously, the low battery LED on the MI 12 or OMI will be lit.

Some machine tool controllers are also programmed to flag a low battery warning to the user.

**Dead battery indicators**

When the battery voltage drops below the threshold where performance can be guaranteed, the OMP40 probe status LED will change to constant red.

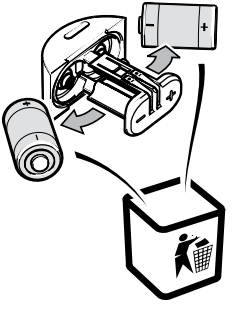
The probe output relay will also be forced into its triggered state, causing the machine to stop, until a new battery is inserted.

**Typical battery reserve life**

The standard Lithium battery at typical 5 % usage will enable the probe to operate for approximately 2 weeks after a low battery warning is first indicated.

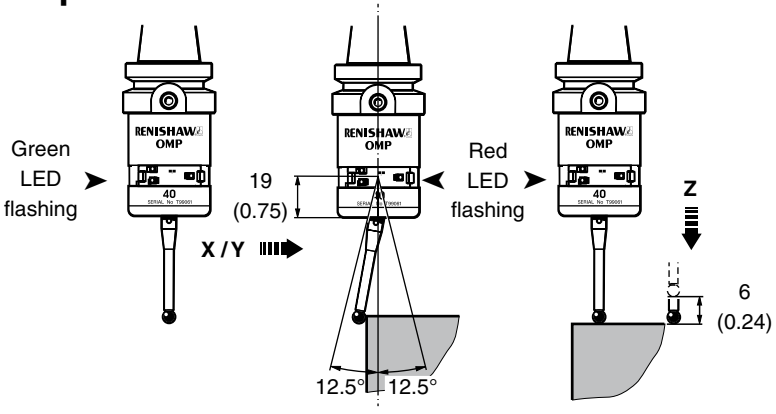
Replace the batteries as soon as is practicable.

**CAUTION:** Please dispose of exhausted batteries in accordance with local regulations. Do not dispose of batteries in fire.



# Modes of operation

dimensions mm (in)




| PROBE STATUS LED | | |
|---|---|---|
| **LED Colour** | **Probe status** | **Graphic hint** |
| Unit | Stand-by mode | |
| 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 | |

| STYLUS OVERTRAVEL LIMITS | | |
|---|---|---|
| **Stylus length** | **±X/±Y** | **Z** |
| 50 (1.97) | 12 (0.47) | 6 (0.24) |
| 100 (3.94) | 22 (0.87) | 6 (0.24) |

For battery information see pages 7 and 8.

The OMP40 probe can be in one of three modes:

1. **Stand-by mode** - The OMP40 uses a small current, while passively waiting for a switch-on signal to be received via the probe's receiving diodes.

2. **Operating mode** - Activated by one of the switch on methods described on page 29. Signals are only transmitted by the probe in this mode showing that the probe is now ready for use.

3. **Programming mode** - The Trigger Logic programming method allows a number of probe set-up options to be programmed by triggering the probe, including the switch-off options described on page 29.

**MI7 interface unit**

**CAUTION:** Systems using the earlier MI7 interface in place of the MI 12 interface are not compatible with OMP40.

| Switch-on | Switch-off |
|---|---|
| **OMP40 Power On/Off**<br><br>OMP40 optical on/off, only occurs when the OMP40 is located within the switch on/off envelope of the OMM/OMI. Three switch on methods can be used, all of which are optical:<br><br>**1. Manual start** - MI 12 start button.<br><br>**2. Machine start** - optical switch-on via software M code command.<br><br>**3. Auto start** - causes the system to send an optical start signal once every second and does not require a machine control input.<br><br>**Note:** Auto start should **not** be selected when the OMP40 is set to the optical-on/optical-off option. | Switch-off options can be changed. See pages 32 and 35.<br><br>**1. Optical-on and optical-off** *factory set*<br>Optical switch-off is commanded by a software M code.<br><br>**2. Optical-on and timer-off** (time-out) *programmable option*<br>A timer switch automatically returns the probe to the stand-by mode after either 12, 33 or 134 seconds. The timer is reset on for a further 12, 33 or 134 seconds, each time the probe triggers during the operating mode.<br><br>**Note:** If the probe does not time out, check if it is in the optical-on/optical-off mode. |

| Enhanced trigger circuit | Enhanced start circuit |
|---|---|
| Probes subjected to high levels of vibration or shock loads, may generate trigger signals without having contacted any surface. The enhanced trigger circuit improves the probe's resistance to these effects.<br><br>When the circuit is enabled, a constant nominal 10 ms delay is introduced to the probe output.<br><br>It may be necessary to revise the probe's program software to allow for the increased stylus overtravel during the extended time delay.<br><br>Factory set to OFF. | Probes subjected to particular forms of light interference may accept spurious start signals. The enhanced start filter improves the probe's resistance to these effects.<br><br>When the filter is enabled, an additional 2 s delay is introduced to the probe activation (switch-ON) time.<br><br>It may be necessary to revise the probe program software to allow for the increased activation time.<br><br>Factory set to OFF. |

| Low power (battery save) mode |
|---|
| Where the separation between probe and OMM or OMI is small, the low power mode may be used. In this mode, the optical transmission range will be reduced by 30 %, so battery usage life will be extended. See battery life expectancy (page 7).<br><br>Factory set to STANDARD POWER. |

# Reviewing current probe settings

**START**

Batteries removed from probe

Insert batteries; note the LED sequence, which follows the form below

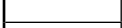
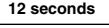
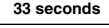
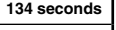
**START UP SEQUENCE**

Settings review

**LED TEST SEQUENCE**

The probe LEDs will always begin with a colour test

**SWITCH-OFF METHOD setting**

| Optical OFF | Short timeout 12 seconds | Medium timeout 33 seconds | Long timeout 134 seconds |
|---|---|---|---|
|  |  |  |  |

**ENHANCED TRIGGER FILTER setting**

| Trigger filter OFF | Trigger filter ON |
|---|---|
|  |  |

**ENHANCED START FILTER setting**

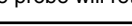
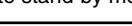
| Start filter OFF | Start filter ON |
|---|---|
|  |  |

**OPTICAL POWER setting**

| Low Power mode | Standard power mode |
|---|---|
|  |  |

**START UP SEQUENCE COMPLETE**

The battery status will be displayed and after 10 s the probe will return to stand-by mode

| Battery good | Battery low |
|---|---|
|  |  |

# Changing probe settings

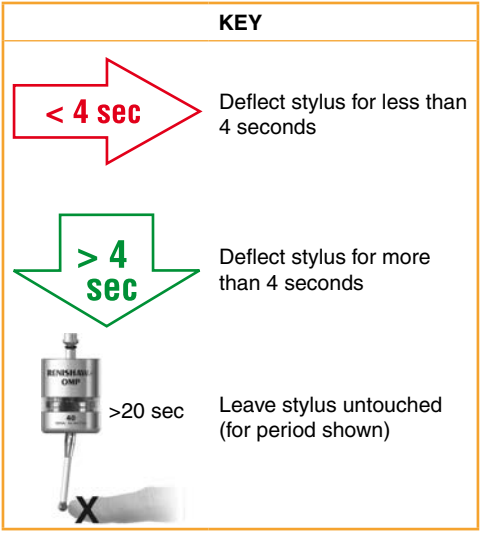
Probe settings can be configured using Trigger Logic.

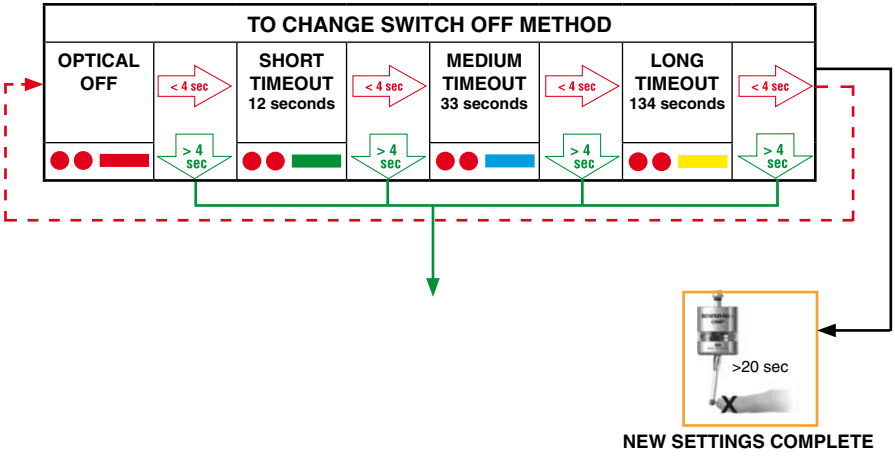
1. Insert batteries or if already inserted, remove for 5 seconds and replace.
2. Following the LED check, deflect the stylus and hold deflected until 5 red flashes occur at end of the review sequence.

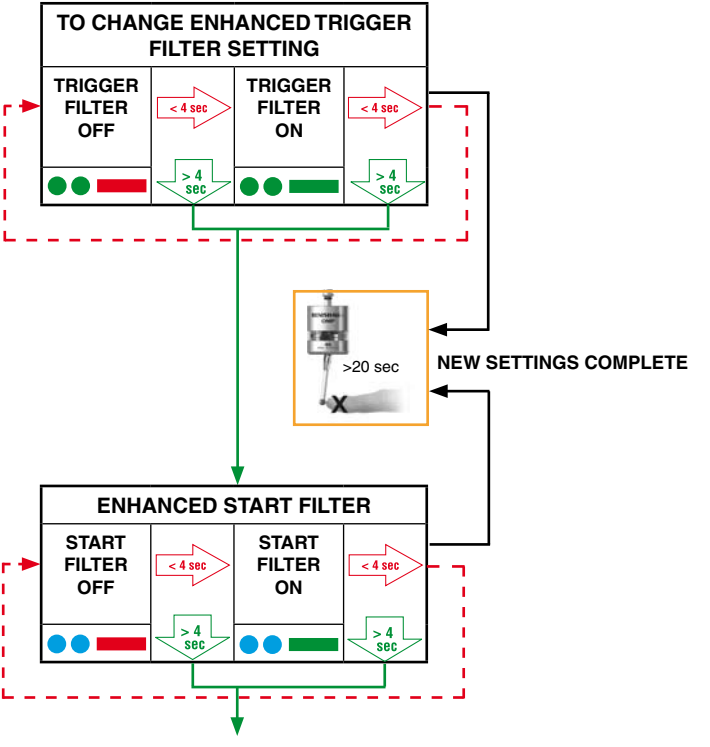
**Notes**: If battery power is low then each of the 5 red flashes will be followed by a blue flash. See 'Probe settings' for further details.

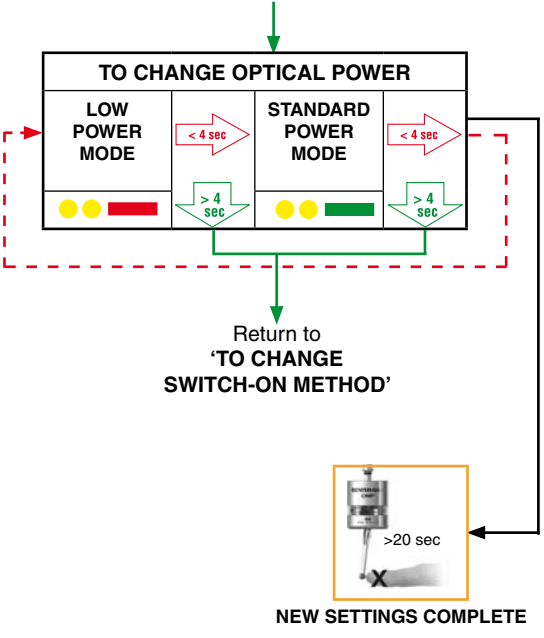
3. The probe is now in configuration mode and will flash the current switch off method. Trigger Logic is now active enabling probe settings to be changed as shown on next page.

**Note:** Settings are saved as they are changed.




TO CHANGE SWITCH OFF METHOD
OPTICAL OFF
< 4 sec
SHORT TIMEOUT
12 seconds
< 4 sec
MEDIUM TIMEOUT
33 seconds
< 4 sec
LONG TIMEOUT
134 seconds
< 4 sec
> 4 sec
> 4 sec
> 4 sec
> 4 sec
>20 sec
NEW SETTINGS COMPLETE


TO CHANGE ENHANCED TRIGGER FILTER SETTING
TRIGGER FILTER OFF
< 4 sec
> 4 sec
TRIGGER FILTER ON
< 4 sec
> 4 sec
>20 sec
NEW SETTINGS COMPLETE
ENHANCED START FILTER
START FILTER OFF
< 4 sec
> 4 sec
START FILTER ON
< 4 sec
> 4 sec




**Stand-by mode**

In stand-by mode the OMP40 is waiting for a switch on signal. LEDs are not lit unless the battery is 'dead'. (see Modes of operation - probe status LEDs, for further information).

**Review current probe settings**

It is recommended that settings are reviewed after programming.

**Settings record table**

For quick reference Renishaw suggest you record your settings on the table at back of this User's guide.

These will be needed if the probe is replaced.

# Service and maintenance

**SAFETY**

**SWITCH POWER OFF WHEN WORKING INSIDE ELECTRICAL COMPARTMENTS**

Although Renishaw probes require little maintenance, the performance will be adversely affected if dirt, chips or liquids are allowed to enter the sealed working parts. Therefore keep all components clean and free from grease and oil.

Clean using a dry or dampened cloth. The OMP40 is sealed against fluids.

Periodically check cables for signs of damage, corrosion or loose connections.

# Fault finding - If in doubt, consult your probe supplier.

| Probe fails to switch on | |
|---|---|
| **Symptom** | **Action** |
| Probe is already switched on. | If necessary switch probe off. |
| Dead batteries. | Change batteries. |
| Batteries installed incorrectly. | Check battery installation. |
| Probe out of range/ not aligned with OMM/OMI. | Check alignment and if OMM/OMI fixing is secure. |
| Beam obstructed. | Check if OMM/OMI window is clean/ remove obstruction. |
| OMM/OMI signal too weak. | See performance envelope. See pages 9. and 10. |
| No OMI start signal. | See OMI installation and user's guide – H-2000-5062. |
| No power to MI 12 or OMI. | Check if stable 24 V supply is available. Check connections and fuses. |

| Probe stops in mid cycle | |
|---|---|
| **Symptom** | **Action** |
| Beam obstructed. | Check OMM/MI 12 error LED. Remove obstruction. |
| Damaged cable. | Check cables. |
| Power supply lost. | Check power supply. |
| Probe unable to find target surface. | Part missing or out of position. |
| Probe false triggers. | Enable enhance trigger filter. |

| MI 12 power low battery LED remains illuminated | |
|---|---|
| **Symptom** | **Action** |
| Dead batteries. | Change batteries. |

| Probe crashes | |
|---|---|
| **Symptom** | **Action** |
| Inspection probe using tool setting probe signals. | When two systems are active, isolate tool setting probe. |
| Workpiece obstructing probe path. | Review probe software. |
| Probe length offset missing. | Review probe software. |

| Probe status LED fails to illuminate | |
|---|---|
| **Symptom** | **Action** |
| Batteries installed incorrectly. | Check battery installation. |

| Probe status LED remains continuously illuminated, or flashes spuriously | |
|---|---|
| **Symptom** | **Action** |
| Battery voltage below usable level. | Replace batteries. |

| Poor probe repeatability | |
|---|---|
| **Symptom** | **Action** |
| Debris on part. | Clean part. |
| Tool change repeatability poor. | Verify probe repeatability using single point move. |
| Loose mounting of probe on shank/loose stylus. | Check and tighten as appropriate. |
| Excessive machine vibration. | Switch on enhanced trigger circuit. Eliminate vibration. |
| Calibration and update of offsets not occurring. | Review probe software. |
| Calibration and probing speeds not the same. | Review probe software. |
| Calibrated feature has moved. | Check position. |
| Measurement occurs as stylus leaves surface. | Review probe software. |

| **Poor probe repeatability** continued | |
|---|---|
| **Symptom** | **Action** |
| Probing occurs within the machine's acceleration and deceleration zones. | Review probe software. |
| Probe feedrate too high. | Perform simple repeatability trials at various speeds. |
| Temperature variation causes excessive machine and workpiece movement. | Minimise temperature changes. Increase frequency of calibration. |
| Machine has poor repeatability due to loose encoders, tight slideways and/or accidental damage. | Perform health check on machine. |

| **Probe stops in mid cycle** | |
|---|---|
| **Symptom** | **Action** |
| Probe in Time Out mode. | Wait a minimum 134 s for probe to switch off. |
| Probe placed in carousel, during Time Out mode can be reset by carousel activity. | Use lighter styli. Review use of Time Out mode (activate trigger filter). |
| Probe is inadvertently switched on by OMM/OMI when using auto-start. | Check positioning of OMM/OMI. Reduce OMM/OMI signal strength. |
| No line-of-sight between probe and OMM/OMI (optical ON/optical OFF only). | Ensure line-of-sight is maintained. |
| Probe is regularly falsely switched on by light interference. | Enable enhance start filter. |

| **Probe is transmitting spurious reading** | |
|---|---|
| **Symptom** | **Action** |
| Damaged cables. | Check and replace cable if damage is found. |
| Electrical interference. | Move transmission cables away from other cables carrying high currents. |
| Optical interference from other systems. | Reduce optical power see page 30. Adjust OMM/OMI range settings. |
| System malfunction or inducing intermittent errors. | Ensure there are no arc welders, stroboscopes or other high intensity light sources in close proximity to the probe system. Electrically isolate OMM from the machine to prevent any possibility of earth loop. |

| **Probe is transmitting spurious reading** cont. | |
|---|---|
| **Symptom** | **Action** |
| Poorly regulated power supply. | Ensure power supply is correctly regulated. |
| Excessive machine vibration. | Switch on enhanced trigger circuit. Eliminate vibration. |
| Loose mountings or styli. | Check and tighten loose connections. |

| **MI 12 power LED fails to illuminate with power on** | |
|---|---|
| **Symptom** | **Action** |
| Faulty electrical contact. | Check all connections. |
| Fuse blown. | Investigate cause. Locate and replace blown fuse. |
| Incorrect power supply. | Ensure power supply is 24 Vdc. |

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

| Type | Part No. | Description |
|---|---|---|
| OMP40/OMM/MI 12 | A-2033-1126 | OMP40 probe with batteries, stylus, OMM, OMM mounting bracket, MI 12 interface unit and tool kit. |
| OMP40/OMI | A-2115-0032 | OMP40 probe with batteries, stylus, OMI, OMI mounting bracket and tool kit. |
| OMP40 | A-4071-0001 | OMP40 probe with batteries and tool kit. |
| Battery | P-BT03-0007 | ½AA batteries (pack of 2). |
| Stylus | A-5000-3709 | PS3-1C ceramic stylus 50 mm long with Ø6 mm ball. |
| Styli | - | For complete listing see Renishaw Styli guide (part no. H-1000-3200). |
| TK62 | A-4071-0060 | Probe tool kit comprising: Ø1.98 mm stylus tool, 2.0 mm AF hexagon key, shank grub screws (x6). |
| OMM | A-2033-0576 | OMM complete with cable Ø4.85 mm x 25 m (Ø0.19 in x 82 ft). |
| OMI | A-2115-0001 | OMI complete with cable Ø4.35 mm x 8 m (Ø0.17 in x 26.25 ft). |
| Mtg brkt | A-2033-0830 | OMM/OMI mounting bracket with fixing screws, washers and nuts. |

| Type | Part No. | Description |
|---|---|---|
| MI 12 | A-2075-0142 | MI 12 interface unit. |
| MI 12-B | A-2075-0141 | MI 12 interface board. |
| Mounting kit | A-2033-0690 | Panel mounting kit for MI 12 interface unit. |
| PSU3 | A-2019-0018 | PSU3 power supply unit 85-264 V input. |
| Software | - | Probe software for machine tools - see Data sheet H-2000-2289. |
| Shank | - | See data sheet H-2000-2011 taper shanks |
| Shank adaptor assembly | A-4071-0031 | Adaptor assembly for mounting to MP10, MP12, MP700 shank. |
| Battery cassette | A-4071-1166 | Probe battery cassette assembly. |
| Cassette seal | A-4038-0301 | Battery housing seal. |
| Pull-up cone assembly | A-4071-0094 | Replacement pull-up cone for attachment to OMP40 shanks. |

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H-2000-5022-05