Installation and user's guide
H-2000-5221-02-B

RENISHAW
apply innovation™

OMP60 - optical machine probe

Disclaimer

Considerable effort has been made to ensure that the contents of this document are free from inaccuracies and omissions. However, Renishaw makes no warranties with respect to the contents of this document and specifically disclaims any implied warranties.

Renishaw reserves the right to make changes to this document and to the product described herein without obligation to notify any person of such changes.

Trademarks

RENISHAW® and the probe emblem used in the RENISHAW logo are registered trademarks of Renishaw plc in the UK and other countries.

apply innovation is a trademark of Renishaw plc.

All brand names and product names used in this document are trade names, service marks, trademarks, or registered trademarks of their respective owners.

Renishaw part no: H-2000-5221-02-B

Issued: 01.07

Contents

CE

EC DECLARATION OF CONFORMITY

Renishaw plc declares that the product: -

Name: OMP60

Description: Optical machine probe

has been manufactured in conformity with the following standard: -

BS EN 61326:1998/ 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 directive (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 DECLARATION (USA)

FCC Section 15.19

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

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

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 the instruction manual, 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.

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

Information for the user

Handle and dispose of batteries in according to the manufacturers recommendations. Use only the recommended batteries. Do not allow the battery terminals to contact other metallic objects.

In all applications involving the use of machine tools or CMMs, eye protection is recommended.

Refer to the machine supplier's operating instructions.

Information for the machine supplier

It is the machine supplier's responsibility to ensure that the user is made aware of any hazards involved in operation, including those mentioned in Renishaw product documentation, and to ensure that adequate guards and safety interlocks are provided.

Under certain circumstances the probe signal may falsely indicate a probe seated condition. Do not rely on probe signals to stop the machine movement.

Installation and user's guide

Warranty

Equipment requiring attention under warranty must be returned to your supplier. No claims will be considered where Renishaw equipment has been misused, or where 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 manufacturers instructions.

Care of the probe

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

Patent notice

Features of OMP60 probes and features of similar probes are the subject of one or more of the following patents and/or patent applications:

CA	1236896	JP	2,945,709
EP	0390342	US	0134085-A1
EP	0695926	US	5,040,931
EP	0974208	US	5,669,151
EP	1130557	US	6,472,981 B2
EP	1185838	US	2002-0158136
EP	1373995	US	2003-0179097
EP	1397637	WO	99/41856
EP	1425550	WO	01/67033
EP	1457786	WO	02/063235
		WO	02/103283

Introduction

The OMP60 is an optical machine probe, suitable for use on medium to large machining and mill-turn centres. It is designed to resist optical interference, false triggering and shock.

The OMP60 can be operated in either ‘Legacy’ or ‘Modulated’ optical transmission modes - see probe settings for further details.

When operating in ‘Legacy’ mode, the OMP60 is compatible with an OMM receiver and MI 12 interface or an OMI receiver/interface.

When operating in the ‘Modulated’ mode, an OMP60 combined with an OMI-2 receiver/interface provides substantially increased resistance to light interference.

All OMP60 settings are configured using the ‘trigger logic’ technique. This enables the user to review and subsequently change probe settings by deflecting the stylus whilst observing the LED display.

Configurable settings are:

- Switch-on/switch off method
- Enhanced trigger filter setting
- Optical transmission method
- Optical power

Getting started

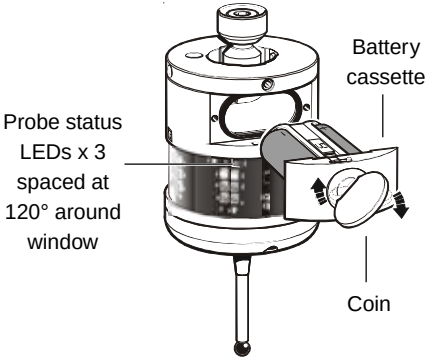
Three multi-colour probe LEDs provide visual indication of selected probe settings.

For example:

- Switch-on and switch-off methods
- Probe status - triggered or seated
- Battery condition

Batteries are inserted or removed as shown (see 'OMP60 batteries' for further information).

On insertion of batteries, the LEDs will begin to flash (see 'Reviewing current probe settings' for further information).



System interface

The interface conveys and processes signals between the probe and CNC machine control.

OMI-2 (Modulated transmission)

The OMI-2 is the recommended interface as it provides substantially increased resistance to light interference.

OMI and OMM (Legacy transmission)

Alternative interfaces are the OMI or OMM with the MI 12 interface unit.

MI 7 interface unit

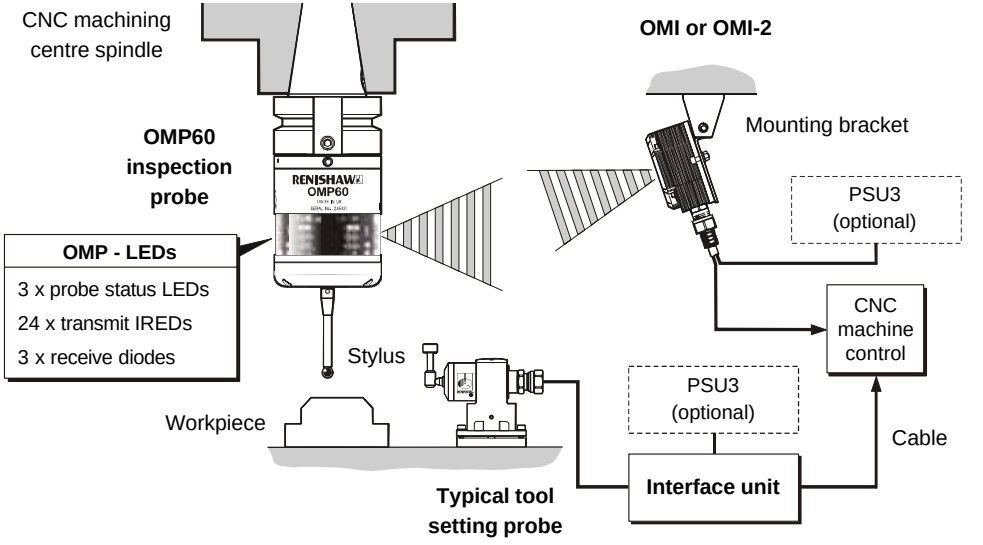
CAUTION: Systems using the earlier MI 7 interface in place of the MI 12 interface are not compatible with OMP60.

Installation

Typical probe system with OMI or OMI-2

The OMP60/OMI system uses legacy transmission.

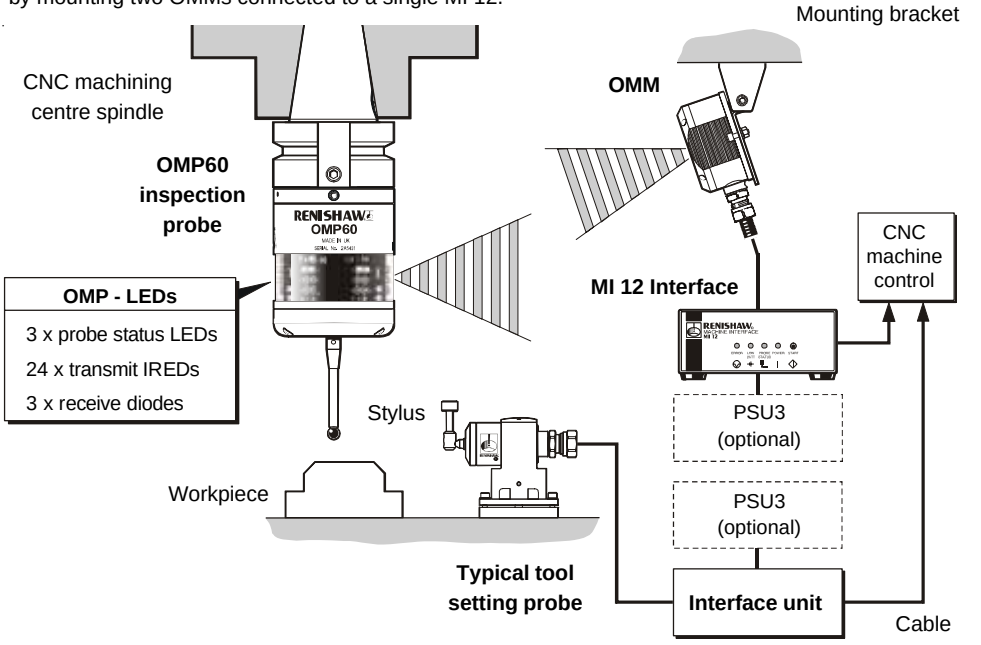
The OMP60/OMI-2 system uses modulated transmission.



Typical probe system with OMM and MI 12

The OMP60/OMM and MI 12 system uses legacy transmission.

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



System performance

Operating envelope

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

Coolant and swarf residue accumulating on the OMP60, OMM, OMI and OMI-2 windows, will have a detrimental effect on transmission performance. Wipe clean as often as is necessary to maintain unrestricted transmission.

Some reduction in range may result when operating in temperatures of 0 °C to 5 °C (32 °F to 41 °F) and 50 °C to 60 °C (122 °F to 140 °F).

Warning

If two systems are operating in close proximity to each other, take care to ensure that signals transmitted from the OMP60 on one machine, are not received by the OMM, OMI or OMI-2 on the other machine, and vice versa.

When this is the case it is recommended that the OMP60 low optical power is used, and that the low range setting is used on the receiver. Please refer to one of the following User's guides:

OMM	H-2000-5044
OMI	H-2000-5062
OMI-2	H-2000-5233

OMM, OMI and OMI-2 position

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

To assist finding the optimum position for the OMI, signal strength is displayed on an OMI multi-coloured LED.

To assist finding the optimum position for the OMI-2, signal condition is displayed on an OMI-2 multi-coloured LED.

Environment

OMP60 OMM MI 12 interface OMI OMI-2 PSU3	Temperature
Storage	-10 °C to 70 °C (14 °F to 158 °F)
Normal operating	5 °C to 50 °C (41 °F to 122 °F)

OMP60 IP rating IPX8

OMP60 weight (without shank)
Without batteries 834 g (29.42 oz)
With batteries 878 g (30.79 oz)

Max spin speed 1000 rev/min

Probe repeatability

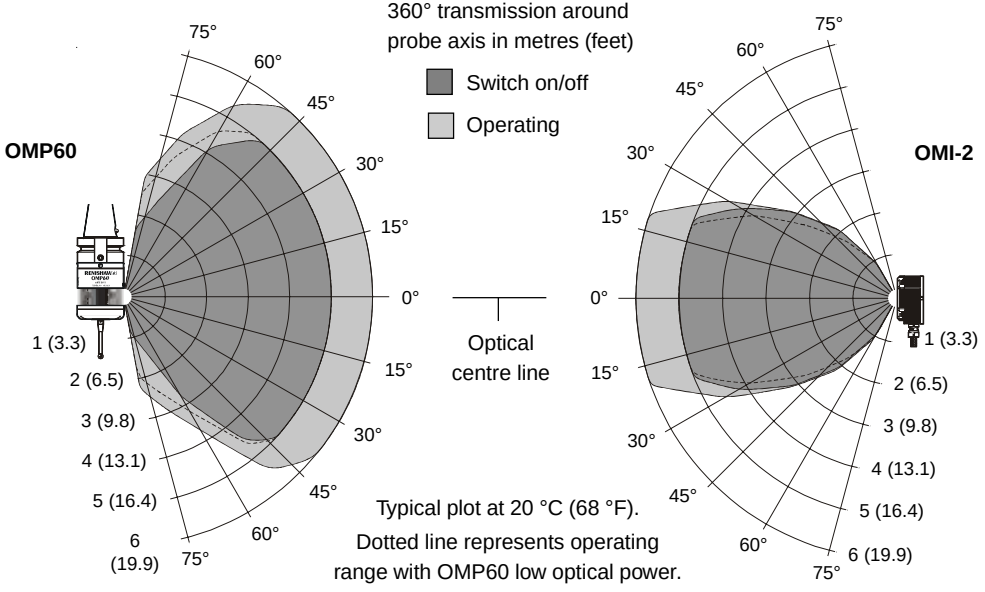
Maximum 2 Sigma (2σ) value;

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

Performance envelope with OMI-2 (modulated transmission)

OMP60 probe + OMI-2

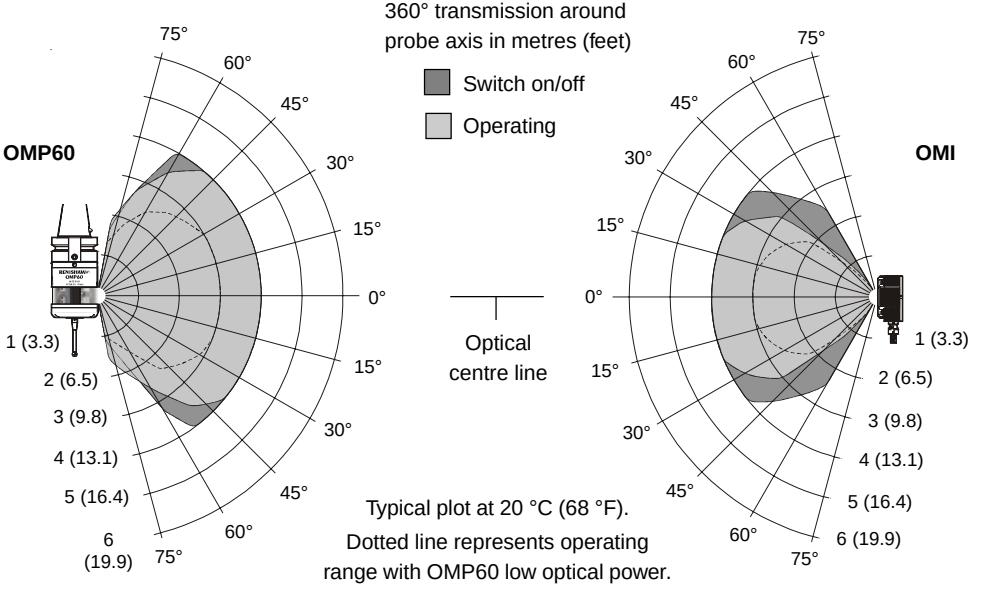
Probe and OMI-2 diodes must be in each others field of view, and within the performance envelope shown. The OMP60 performance envelope is based on the OMI-2 being at 0 °, and vice-versa.



Performance envelope with OMI (legacy transmission)

OMP60 probe + OMI

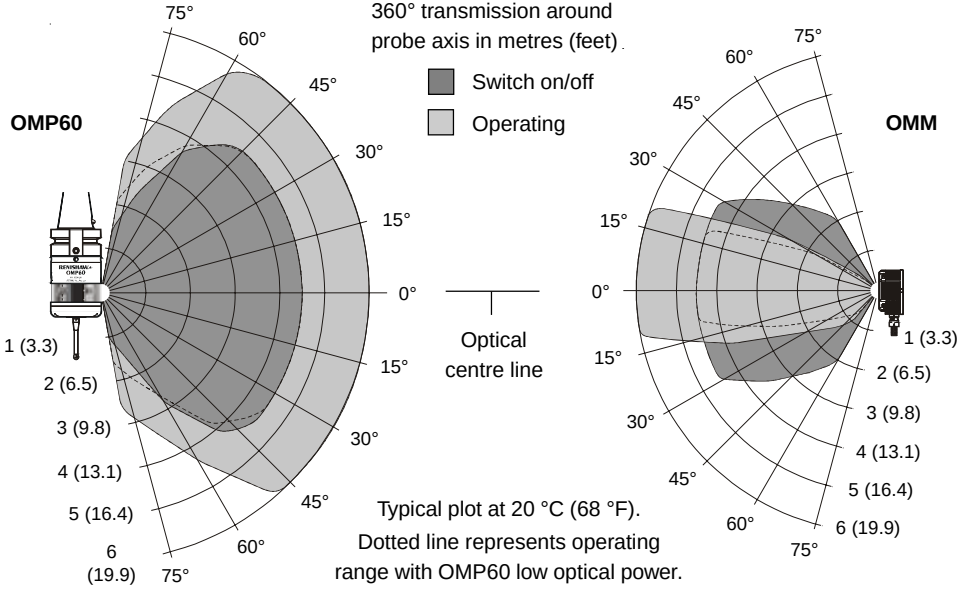
Probe and OMI diodes must be in each others field of view, and within the performance envelope shown. The OMP60 performance envelope is based on the OMI being at 0 °, and vice-versa.



Performance envelope with OMM (legacy transmission)

OMP60 probe + OMM

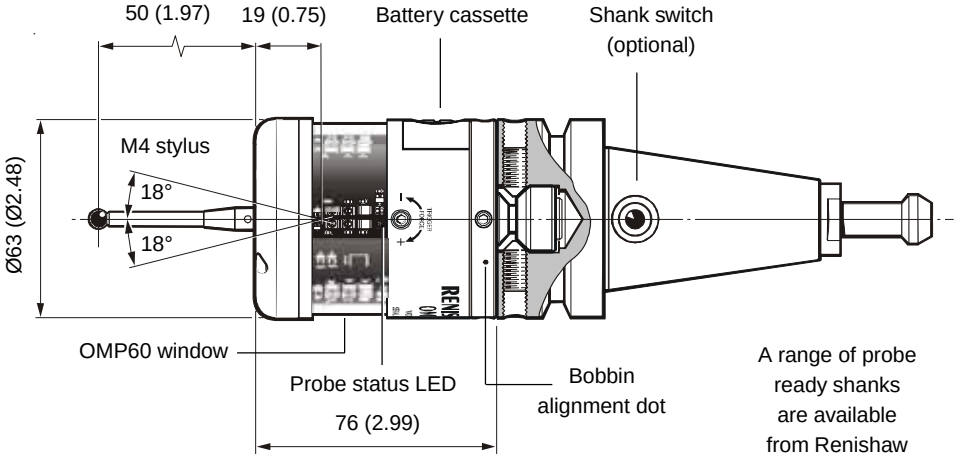
Probe and OMM diodes must be in each others field of view, and within the performance envelope shown. The OMP60 performance envelope is based on the OMM being at 0 °, and vice-versa.



Typical plot at 20 °C (68 °F).
Dotted line represents operating range with OMP60 low optical power.

OMP60 dimensions

dimensions mm (in)



STYLUS OVERTRAVEL LIMITS		
Stylus length	**±X / ±Y**	**Z**
50 (1.96)	21 (0.82)	11 (0.43)
100 (3.93)	37 (1.45)	11 (0.43)

Stylus weak link

Must be used with steel styli.

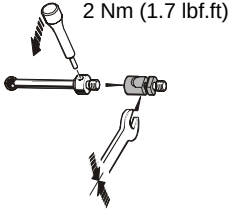
For optimum metrology performance do not use a weak link with ceramic or carbon fibre styli.

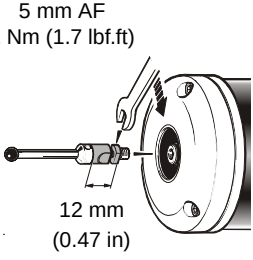
Fitting stylus with weak link onto OMP60

In the event of excessive stylus overtravel, the weak link is designed to break, thereby protecting the probe from damage.

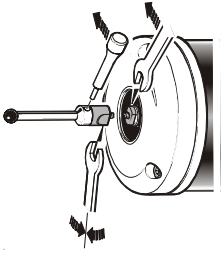
Take care to avoid stressing the weak link during assembly.

Fitting a weak link





Removing a broken weak link



Probe settings

The OMP60 probe can be in one of three modes:

Stand-by mode - The OMP60 is waiting for a switch on signal.

Operating mode - Activated by one of the switch on methods described on this page. In this mode the OMP60 is now ready for use.

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

Switch on / switch off methods

Switch on / switch off options are configurable

1. Optical on / Optical off
2. Optical on / Timer off
3. Spin on / Spin off
4. Spin on / Timer off
5. Shank switch on / Shank switch off

Note:
In optical start, the following total system time applies before OMP60 is ready to start probing:

Legacy (start filter off)	0.5 sec
Legacy (start filter on)	1.5 sec
Modulated	0.5 sec

In shank switch on, the OMP60 will be switched on in approx 0.5 sec.

In spin start, the OMP60 will be switched on, after 1 sec.

After spin start, the OMP60 must be on for 7 sec before being switched off.

Switch-on method	Switch-off methods available
Optical on Optical switch on when commanded by M code.	**Optical off** Optical switch off when commanded by M code. A timer automatically switches the probe off after 90 min from last trigger if not turned off by M code. **Timer off** (time out) Time out will occur (12, 33 or 134 sec) after the last probe trigger or reseat.
Optical on Optical switch on when commanded by auto start	**Timer off** (time out) Time out will occur (12, 33 or 134 sec) after the last probe trigger or reseat.
Spin on Spin at 650 rev/min for 1 sec minimum (6 sec maximum).	**Spin off** Spin at 650 rev/min for 1 sec minimum (6 sec maximum). A timer automatically switches the probe off after 90 min from last trigger if not spun. **Timer off** (time out) Time out will occur (12, 33 or 134 sec) after the last probe trigger or reseat.
Shank switch on	**Shank switch off**

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 probes resistance to these effects.

When the filter is enabled, a constant nominal 10, 20 or 40 ms delay is introduced to the probe output.

It may be necessary to reduce the probe approach speed to allow for the increased stylus overtravel during the extended time delay.

Factory set to OFF.

Optical transmission method

Probes subjected to particular forms of light interference may accept spurious start signals.

The OMP60 can be operated in either 'Legacy' or 'Modulated' optical transmission modes.

In Legacy mode a start filter improves the probe's resistance to these effects.

When Legacy (start filter on) is enabled, an additional 2 sec delay is introduced to the probe activation (switch on) time.

It may be necessary to revise the probe program software to allow for the increased activation time.

In Modulated mode, the OMP60 becomes compatible for use with OMI-2, to provide substantially increased resistance to light interference.

Low optical power

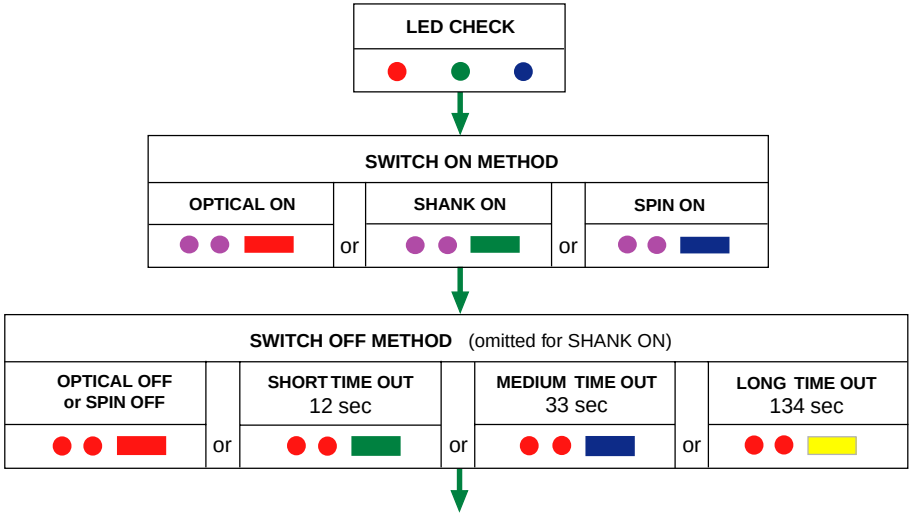
Where the separation between OMP60 and the OMI-2, OMI or OMM is small, the low optical power may be used. In this setting, the optical transmission range will be reduced as shown on performance envelopes, so battery life will be extended.

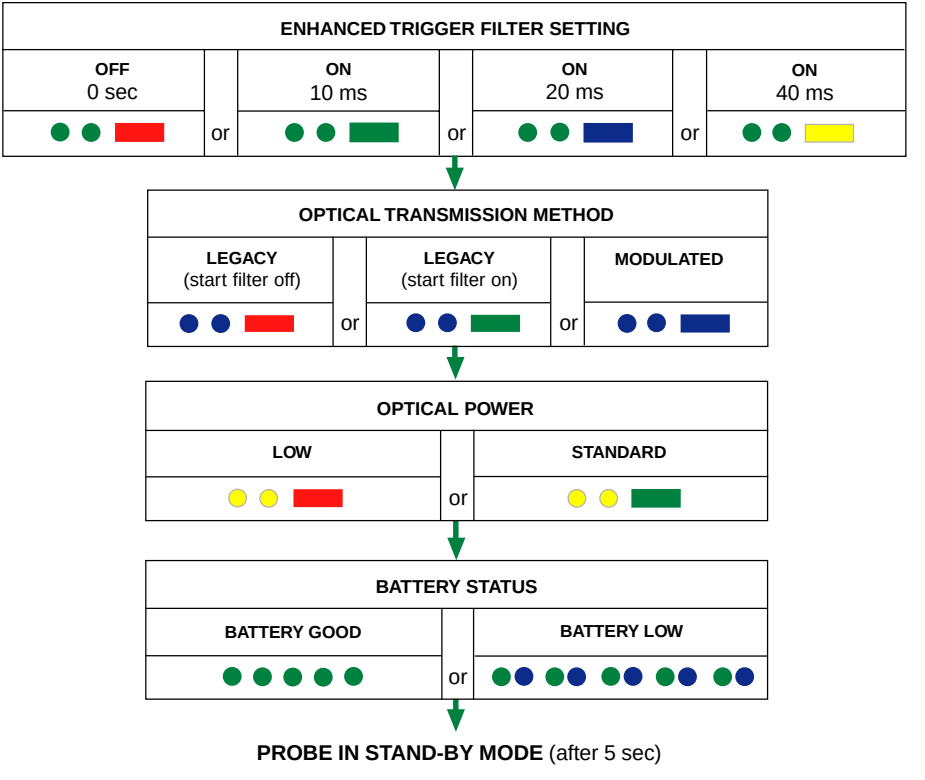
Dotted lines on performance envelopes represent the OMP60 in low optical power.

Factory set to standard optical power.

Reviewing current probe settings

1. Insert batteries, or if already inserted remove for 5 sec and replace.
2. **DO NOT** deflect stylus when reviewing settings.
3. LEDs will show the following sequence.




ENHANCED TRIGGER FILTER SETTING
OFF
0 sec
or
ON
10 ms
or
ON
20 ms
or
ON
40 ms
OPTICAL TRANSMISSION METHOD
LEGACY
(start filter off)
or
LEGACY
(start filter on)
or
MODULATED
OPTICAL POWER
LOW
or
STANDARD
BATTERY STATUS
BATTERY GOOD
or
BATTERY LOW
PROBE IN STAND-BY MODE (after 5 sec)

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.

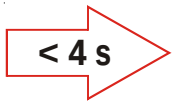
Note:
If battery power is low then each of the 5 red flashes will be followed by a blue flash

See ‘Probe settings’ for further details

3. The probe is now in configuration mode and will flash the current switch on 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

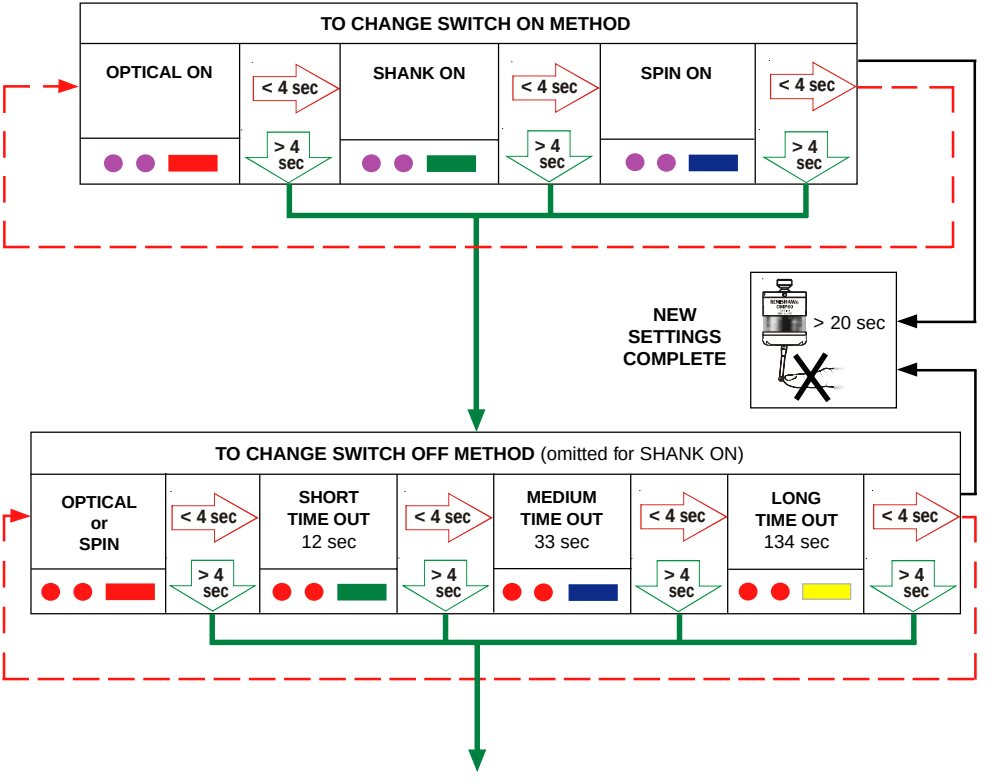
KEY

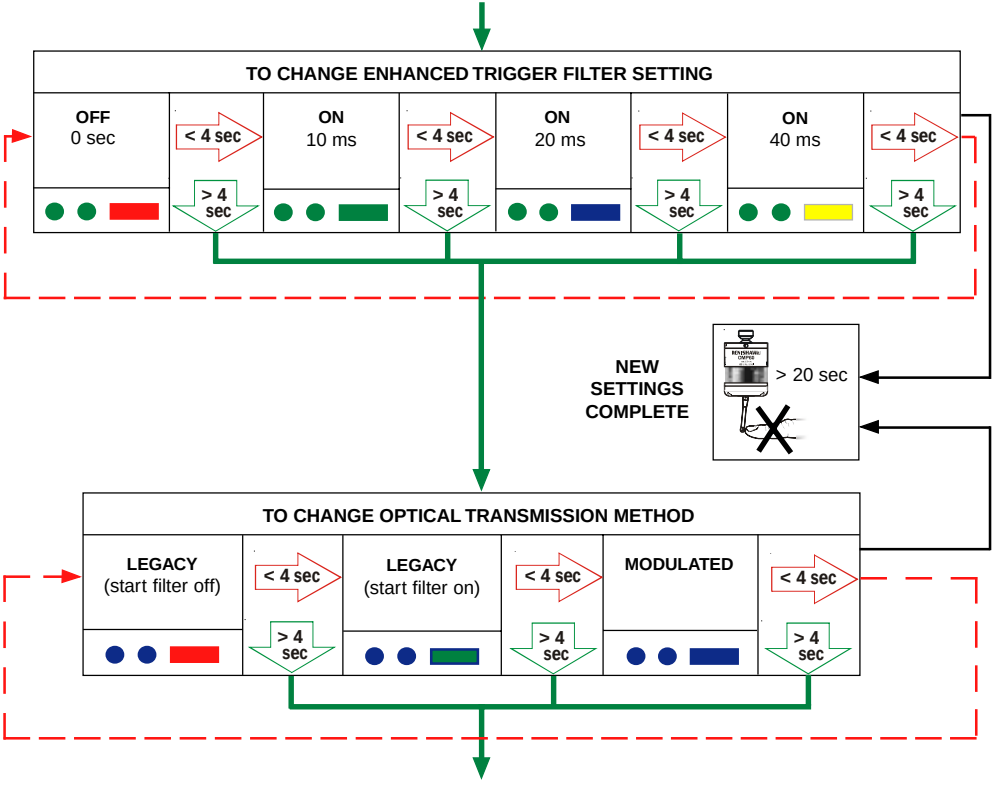


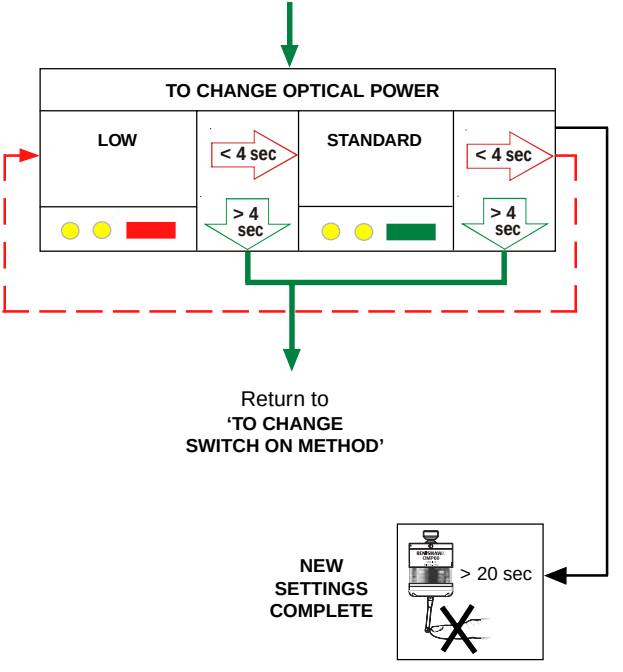
Deflect stylus for less than 4 seconds

Deflect stylus for more than 4 seconds

Leave stylus untouched (for period shown)


TO CHANGE SWITCH ON METHOD
OPTICAL ON
< 4 sec
> 4 sec
SHANK ON
< 4 sec
> 4 sec
SPIN ON
< 4 sec
> 4 sec
NEW SETTINGS COMPLETE
> 20 sec
TO CHANGE SWITCH OFF METHOD (omitted for SHANK ON)
OPTICAL or SPIN
< 4 sec
> 4 sec
SHORT TIME OUT 12 sec
< 4 sec
> 4 sec
MEDIUM TIME OUT 33 sec
< 4 sec
> 4 sec
LONG TIME OUT 134 sec
< 4 sec
> 4 sec


TO CHANGE ENHANCED TRIGGER FILTER SETTING
OFF
0 sec
< 4 sec
> 4 sec
ON
10 ms
< 4 sec
> 4 sec
ON
20 ms
< 4 sec
> 4 sec
ON
40 ms
< 4 sec
> 4 sec
NEW SETTINGS COMPLETE
> 20 sec
TO CHANGE OPTICAL TRANSMISSION METHOD
LEGACY
(start filter off)
< 4 sec
> 4 sec
LEGACY
(start filter on)
< 4 sec
> 4 sec
MODULATED
< 4 sec
> 4 sec



Stand-by mode

In stand-by mode the OMP60 is waiting for a switch on signal. LEDs are not lit unless the battery is 'dead'. (see Operating mode - probe status LEDs, for further information)

Review current probe settings

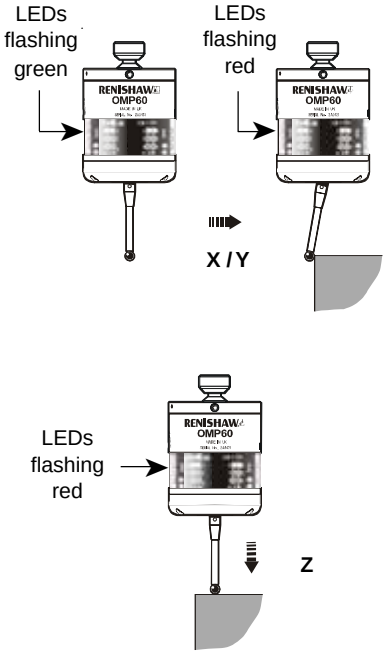
It is recommended that settings are reviewed after programming.

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.

Operating mode



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 or flashing red	Battery dead	
Flashing red or flashing red and green or sequence (when batteries are inserted)	Unsuitable battery	

OMP60 batteries

Replacing batteries

Only use specified batteries.

Clean and dry OMP60 with a cloth or paper towel before removing battery cassette.

When the OMP60 has been exposed to coolant, it is recommended that the area around the battery cassette is cleaned.

To access the OMP60 batteries, remove the battery cassette by rotating the securing screw 30° anticlockwise and withdrawing battery cassette.

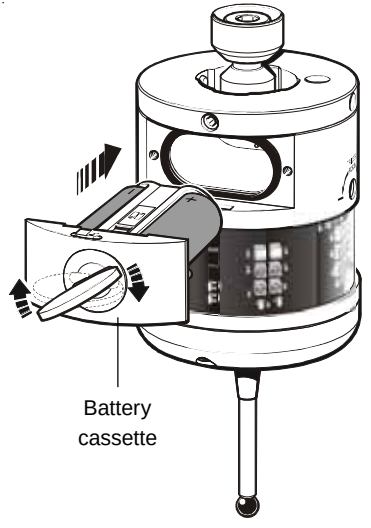
Take care to avoid damaging the battery cassette gasket.

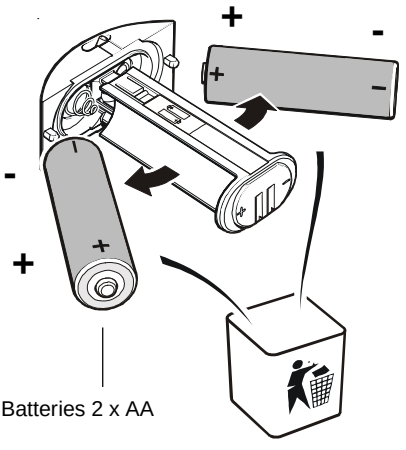
When inserting the batteries, ensure they are loaded as shown (see next page).

If one or more batteries are incorrectly loaded, the probe will not function.

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

Always ensure that the cassette gasket and mating surfaces are clean and free from dirt before reassembly.





DO NOT leave exhausted batteries in probe

DO NOT allow coolant or debris to enter the battery compartment

DO check for correct battery polarity

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

Battery life

LEGACY optical transmission mode ★					
Battery	**Stand-by life** (days - typical)	**5% usage = 72 minutes/day** (days - typical)		**Continuous use** (hours - typical)	
Two AA type		**Standard power mode**	**Low power mode**	**Standard power mode**	**Low power mode**
Alkaline	468	71	111	100	172
LTC	1019	229	339	350	595
MODULATED optical transmission mode ★					
Battery	**Stand-by life** (days - typical)	**5% usage = 72 minutes/day** (days - typical)		**Continuous use** (hours - typical)	
Two AA type		**Standard power mode**	**Low power mode**	**Standard power mode**	**Low power mode**
Alkaline	468	65	86	90	125
LTC	1019	203	270	300	433

LTC - Lithium Thionyl Chloride

★ Data applicable for both 'optical switch-on' and shank/spin switch-on' start modes

Low power mode

Low optical power should be used whenever possible for increased battery life.

Maximum battery life is achieved when Lithium Thionyl Chloride (LTC) batteries are used in conjunction with low power mode.

Low battery indicators

The low battery warning will be signalled by the flashing of probe status and blue LEDs when the end of the usable battery life is approaching.

Typical battery reserve life

When using typical alkaline batteries at 5 % usage, the probe will continue to operate for approximately 1 week after a low battery warning is first indicated.

Replace the batteries as soon as possible.

After batteries are inserted into the OMP60, flashing LEDs will indicate the current settings.

Dead battery indication

When the batteries have no usable power left, the OMP60 probe status LEDs will change to constant red, followed by flashing red.

Battery specification

The OMP60 requires two identical AA size batteries.

The standard batteries are AA alkaline. Alternative batteries are Lithium Thionyl Chloride (3.6 V), Lithium Manganese, Lithium Iron, Nickel Cadmium or Nickel Metal Hydride.

Rechargeable batteries: either Nickel Cadmium or Nickel Metal Hydride can be used. Expect a battery life of approximately 50% of alkaline figures.

For applications requiring greater battery life, high capacity Lithium Thionyl Chloride batteries (LTC) can be used.

When selecting Lithium Thionyl Chloride batteries, please use these specified part numbers only.

Supplier	**Part number**
RS Radio Shack	596-602, 201-9438, 23-037

Manufacturer	**Part number**
Saft	LS 14500
Sonnenschein	SL 760/S
Tadiran	TL-5903/S, TL-2100/S
Xeno	XL-060F

OMP60 shank mounting

Stage 1 OMP60 shank mounting

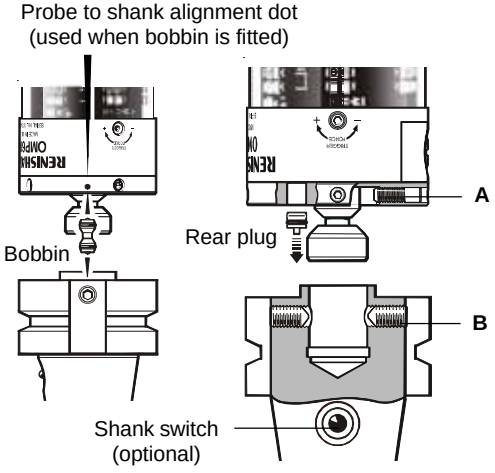
If the OMP60 is not to be used with a shank switch, please proceed from step 3.

1. Remove plug from rear of OMP60 using pliers.
2. Place bobbin into shank.
3. Fully slacken four screws **A**.
4. Grease two screws **B**, and fit into shank.
5. Fit OMP60 onto the shank, and visually position central relative to the shank.
6. Partially tighten screws **B** to 2 - 3 Nm (1.5 - 2.2 lbf.ft).

(If the OMP60 is NOT to be on-centre adjusted, fully tighten screws **B** to 6-8 Nm (4.4 - 5.9 lbf ft).

The OMP60 assembly is ready for use.

For on-centre adjustment complete steps 7-10. (see next page).



Note :

1. During adjustment care should be taken NOT to rotate the probe relative to the shank, as damage to the shank switch bobbin may occur (if fitted).
2. If a probe on a shank is accidentally dropped, it should be checked for on-centre position.
3. Do NOT hit or tap the probe to achieve on-centre adjustment.

Stylus on-centre adjustment (if required)

Stage 2 On-centre adjustment

7. Each of the four screws **A** will move the probe relative to the shank, in the X or Y direction as pressure is applied.

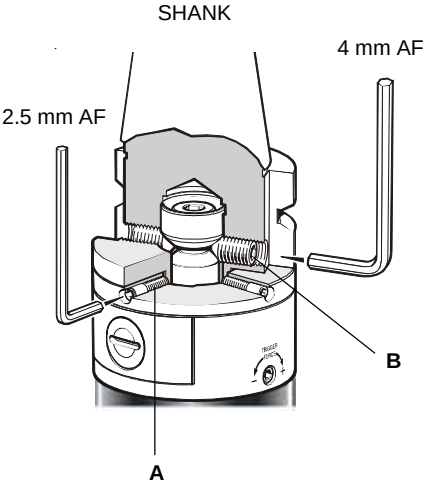
   Tighten individually, backing off after each movement.

8. When the stylus tip run-out is less than 20 µm, fully tighten screws **B** to 6 - 8 Nm (4.4 - 5.9 lbf.ft).

9. For final centering use screws **A** to move the OMP60, progressively slackening on one side and tightening the opposite screw, as the final setting is approached, using two hexagon keys.

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

10. It is important that all four screws **A** are tight or tightened to 1.5 - 3.5 Nm (1.1 - 2.6 lbf.ft) once the final setting has been achieved.



Stylus trigger force and adjustment

Spring force within the probe causes the stylus to sit in a unique position, and return to this position following each stylus deflection.

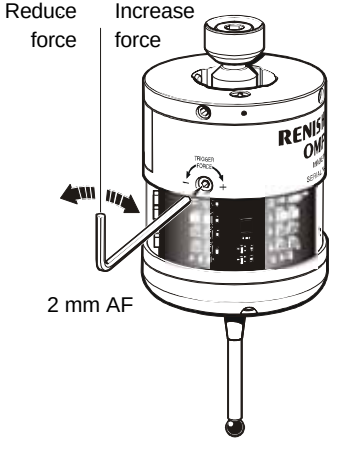
Stylus trigger force is set by Renishaw. The user should only adjust trigger force in special circumstances e.g. excessive machine vibration or insufficient force to support the stylus weight.

To adjust trigger force, turn the adjusting screw anticlockwise to reduce force (more sensitive) or clockwise to increase force (less sensitive). A stop helps to prevent damage, which could be caused by over-tightening the adjusting screw.

Stylus trigger force **(50 mm stylus)**

XY trigger forces vary around the stylus seating

Factory setting:	XY	Low	0.75 N / 75 gf (2.6 ozf)
	XY	High	1.40 N / 140 gf (4.9 ozf)
	Z		5.30 N / 530 gf (18.69 ozf)
Adjustment: Maximum setting			
	XY	Low	2.0 N / 200 gf (7.0 ozf)
	XY	High	3.5 N / 350 gf (12.3 ozf)
	Z		14 N / 1400 gf (49.38 ozf)
Adjustment: Minimum setting			
	XY	Low	0.5 N / 50 gf (1.7 ozf)
	XY	High	0.9 N / 90 gf (3.2 ozf)
	Z		3.5 N / 350 gf (12.35 ozf)



Diaphragm replacement

OMP60 diaphragms

The probe mechanism is protected from coolant and debris by two diaphragms. These provide adequate protection under normal working conditions.

The user should periodically check the outer diaphragm for signs of damage. If this is evident, replace the outer diaphragm.

The user must not remove the inner diaphragm. If damaged, return the probe to your supplier for repair.

Outer diaphragm inspection

1. Remove the stylus.
2. Undo three M3 front cover screws and remove the front cover.
3. Inspect outer diaphragm for damage.
4. To remove outer diaphragm, grip by the outer edge and pull off.

Inner diaphragm inspection

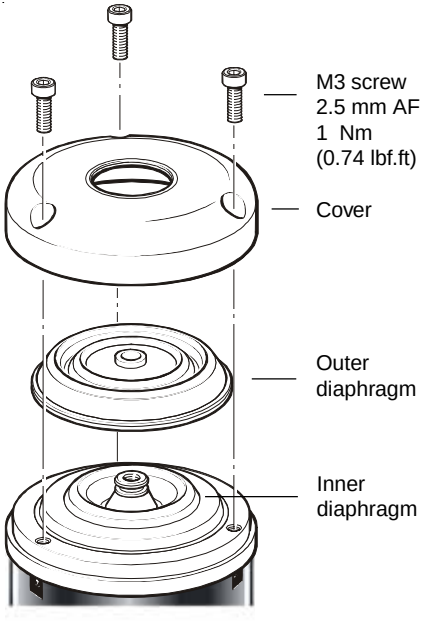
5. Inspect inner diaphragm for damage.

If damaged return the probe to your supplier.

DO NOT REMOVE INNER DIAPHRAGM AS WARRANTY WILL BE VOID.

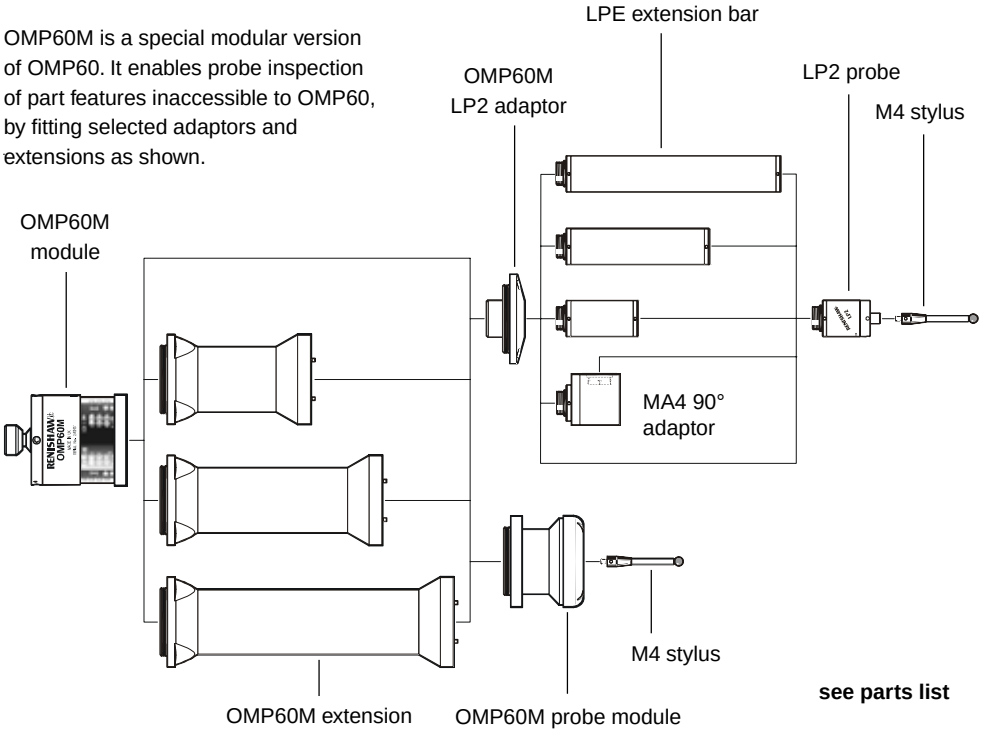
Outer diaphragm replacement

6. Fit new diaphragm over centre.
7. Locate outer edge of diaphragm to rest on outer edge of inner diaphragm.
8. Refit front cover and M3 screws.
9. Refit stylus and re-calibrate probe.



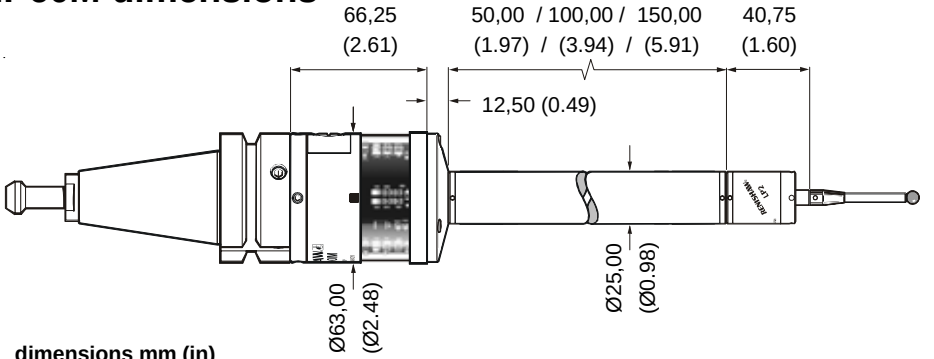
OMP60M system

OMP60M is a special modular version of OMP60. It enables probe inspection of part features inaccessible to OMP60, by fitting selected adaptors and extensions as shown.

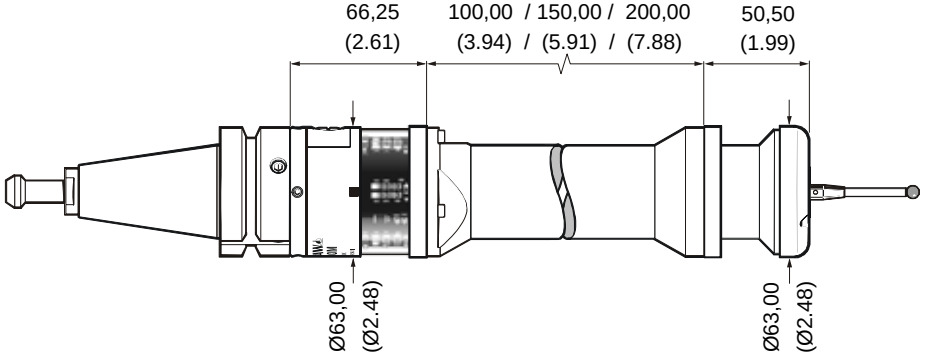


see parts list

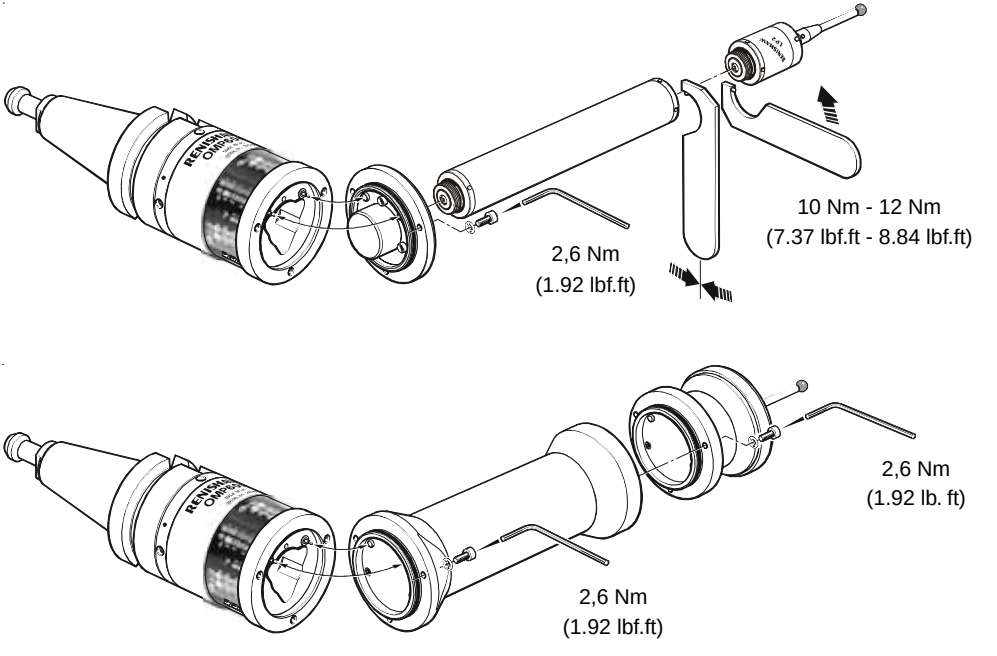
OMP60M dimensions



dimensions mm (in)



OMP60M screw torque values



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

Symptom	Cause	Action
Probe fails to power up (No LEDs illuminated, or fails to indicate current probe settings)	Dead batteries.	Change batteries
	Wrong batteries	Change batteries
	Batteries inserted incorrectly	Check battery insertion
Probe fails to switch on (Optical on is required)	Wrong transmit mode selected	Reconfigure transmit mode
	Wrong switch on mode selected	Reconfigure to optical on mode
	Dead batteries	Change batteries
	Wrong batteries	Change batteries
	Batteries inserted incorrectly	Check battery insertion
	Optical/magnetic interference	Check for interfering lights or motors Consider removing interfering source
continued on next page	Probe out of range/not aligned with receiver	Check alignment and if receiver fixing is secure

Symptom	Cause	Action
Probe fails to switch on (Optical on is required)	Beam obstructed	Check that OMP60 and receiver windows are clean, and remove any obstruction
	No receiver start signal	Refer to relevant User's guide
	No power to MI 12 or receiver	Check if stable 24 V supply is available
		Check connections and fuses
Probe fails to switch on (Shank on is required)	Wrong switch on mode is selected	Reconfigure to shank on mode
	Dead batteries	Change batteries
	Wrong batteries	Change batteries
	Batteries inserted incorrectly	Check battery insertion
	Malfunctioning shank switch	Check switch operation
	No bobbin installed	Install bobbin

Symptom	Cause	Action
Probe fails to switch on (Spin on is required)	Wrong switch on mode selected	Reconfigure to spin on mode
	Dead batteries	Change batteries
	Wrong batteries	Change batteries
	Batteries inserted incorrectly	Check battery insertion
	Incorrect spindle speed selected	Program correct spindle speed/duration
	Excessive spindle vibration	Consider use of optical or shank switch-on methods
Machine stops unexpectedly during probing cycle	Optical communication obstructed	Check interface/receiver and remove obstruction
	Interface/receiver/machine fault	Refer to interface/receiver/ machine User's guide
	Dead batteries	Change batteries
	False probe trigger	Adjust stylus trigger force and/or enable enhanced trigger filter
	Probe unable to find target surface	Check that part is correctly positioned and that stylus has not broken
	Adjacent probe	Reconfigure to low power mode and reduce range of receiver

Symptom	Cause	Action
Probe crashes	Inspection probe using tool setting probe signals	When two systems are active, isolate tool setting probe
	Workpiece obstructing probe path	Review probing software
	Adjacent probe	Reconfigure to low power mode and reduce range of receiver
	Probe length offset missing	Review probing software
Poor probe repeatability and/or accuracy	Debris on part or stylus	Clean part and stylus
	Poor tool change repeatability	Redatum probe after each tool change
	Loose probe mounting on shank or loose stylus	Check and tighten as appropriate
	Excessive machine vibration	Increase stylus spring force or enable enhanced trigger filter
		Eliminate vibrations
	Calibration out of date and/or incorrect offsets	Review probing software
	Calibration and probing speeds not the same	Review probing software

continued on next page.

Symptom	Cause	Action
Poor probe repeatability and/or accuracy	Calibration feature has moved	Correct position
	Measurement occurs as stylus leaves surface	Review probing software
	Measurement occurs within the machine's acceleration and deceleration zone	Review probing software, probe filter settings and stylus trigger force.
	Probing speed too high	Perform simple repeatability trials at various speeds
	Temperature variation causes machine and workpiece movement.	Minimise temperature changes
	Machine tool faulty	Perform health checks on machine

Symptom	Cause	Action
Probe fails to switch off (Optical off is required)	Wrong switch off mode selected	Reconfigure to optical off mode
	Optical/magnetic interference	Check for interfering lights or motors.
		Consider removing the interfering source
	Probe is inadvertently switched-on by the receiver when using autostart	Check position of receiver
		Reduce receiver signal strength
	Probe out of range	Review performance envelopes
	Probe is regularly falsely switched-on by light interference	Enable optical transmission legacy mode (start filter on), or select modulated when modulated receiver is used.
Probe fails to switch off (Shank off is required)	Malfunctioning switch	Check switch operation

Symptom	Cause	Action
Probe fails to switch off (Spin off is required)	Wrong switch off mode is selected Incorrect spindle speed is selected Excessive spindle vibration	Reconfigure to spin off mode Program correct spindle speed/duration Consider use of optical or shank switch-on
Probe fails to switch off (Time out is required)	Wrong switch off mode is selected Probe placed in carousel, when in time out mode, timer can be reset by carousel activity.	Reconfigure to time out mode Use lighter styli
Probe fails to communicate with interface after spin or shank on	Wrong transmit mode selected Optical/magnetic interference	Reconfigure transmit mode Check for interfering lights or motors Consider removing interfering source

Parts list - Please quote the Part no. when ordering equipment.

Type	Part no.	Description
OMP60	A-4038-0001	OMP60 probe with batteries, tool kit and User's guide (set to optical on/optical off) - legacy transmission.
OMP60	A-4038-0002	OMP60 probe with batteries, tool kit and User's guide (set to optical on/time off 134 sec) - legacy transmission.
OMP60	A-4038-2001	OMP60 probe with batteries, tool kit and User's guide (set to optical on/optical off) - modulated transmission.
OMP60	A-4038-2002	OMP60 probe with batteries, tool kit and User's guide (set to optical on/time off 134 sec) - modulated transmission.
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-5000-3709	PS3-1C ceramic stylus 50 mm long with Ø6 mm ball.
Weak link kit	A-2085-0068	Weak link (Part no. M-2085-0069 x 2) and 5 mm AF spanner.
Styli	—	For complete listing please see Renishaw Styli Guide. Part no. H-1000-3200.

Type	Part no.	Description
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 mm AF hexagon key, and shank grub screws (x 2).
Diaphragm kit	A-4038-0302	OMP60 outer diaphragm.
Battery cassette	A-4038-0300	OMP60 battery cassette assembly.
Cassette seal	A-4038-0301	Battery cassette housing seal.
Bobbin kit	A-4038-0303	Bobbin for shank switch.
Shanks	—	For complete listing please see Renishaw Data sheet H-2000-2011.
Shank adaptor	A-4038-0060	MP8 - OMP60 shank adaptor.
Shank adaptor	A-4038-0076	MP10 - OMP60 stylus ball on-centre adjustment adaptor.
Shank adaptor	A-4038-0077	MP10 - OMP60 shank adaptor.
Shank adaptor	A-4038-0078	MP7/MP9 - OMP60 shank adaptor.
Software	—	For complete list of Renishaw software for machine tools please see Data sheet. Part no. H-2000-2289.

Type	Part no.	Description
OMP60M module	A-4038-1003	OMP60M module with batteries, tool kit and User's guide. (set to optical on/optical off) - legacy transmission.
OMP60M module	A-4038-0368	OMP60M module with batteries, tool kit and User's guide. (set to optical on/time off 134 sec) - legacy transmission.
OMP60M module	A-4038-0369	OMP60M module with batteries, tool kit and User's guide. (set to optical on/optical off) - modulated transmission.
OMP60M module	A-4038-0370	OMP60M module with batteries, tool kit and User's guide. (set to optical on/time off 134 sec) - modulated transmission.
Extension L100	A-4038-1010	OMP60M extension - 100 mm long.
Extension L150	A-4038-1027	OMP60M extension - 150 mm long.
Extension L200	A-4038-1028	OMP60M extension - 200 mm long.
Probe module	A-4038-1002	OMP60M probe module assembly.
OMP60M LP2 adaptor	A-4038-0212	OMP60M LP2 adaptor assembly
LPE1	A-2063-7001	LPE1 extension bar - 50 mm long.
LPE2	A-2063-7002	LPE2 extension bar - 100 mm long.
LPE3	A-2063-7003	LPE3 extension bar - 150 mm long.
MA4	A-2063-7600	MA4 90° adaptor assembly.

Type	Part no.	Description
PSU3	A-2019-0018	PSU3 power supply unit 85-264 V input.
MI 12	A-2075-0142	MI 12 interface unit.
MI 12-B	A-2075-0141	MI 12-B interface unit.
Mounting kit	A-2033-0690	Panel mounting kit for MI 12 interface unit.
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).
OMI-2	A-5191-0049	OMI-2 complete with cable 8 m (26.25 ft) long.
Mounting bracket	A-2033-0830	OMM/OMI/OMI-2 mounting bracket with fixing screws, washers and nuts.

Probe settings record table

		✔ tick
Switch-on method	Optical on	
	Shank on	
	Spin on	
Switch-off method	Optical or spin	
	Short time out	
	Medium time out	
	Long time out	
Enhanced trigger filter	OFF	
	ON (10 ms)	
	ON (20 ms)	
	ON (40 ms)	
Optical transmission start	Legacy (start filter off)	
	Legacy (start filter on)	
	Modulated	
Optical power	Low power	
	Standard power	

OMP60 serial no. _____

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

T +44 (0)1453 524524
F +44 (0)1453 524901
E uk@renishaw.com
www.renishaw.com

RENISHAW
apply innovation™

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

H-2000-5221-02