

OLP40 optical lathe probe



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Before you begin

1.1

Before you begin

Disclaimer

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

Warranty

Equipment requiring attention under warranty must be returned to your equipment supplier.

Unless otherwise specifically agreed in writing between you and Renishaw, if you purchased the equipment from a Renishaw company, the warranty provisions contained in Renishaw's CONDITIONS OF SALE apply. You should consult these conditions in order to find out the details of your warranty, but in summary the main exclusions from the warranty are if the equipment has been:

- neglected, mishandled or inappropriately used; or
- modified or altered in any way except with the prior written agreement of Renishaw.

If you purchased the equipment from any other supplier, you should contact them to find out what repairs are covered by their warranty.

Changes to equipment

Renishaw reserves the right to change equipment specifications without notice.

CNC machines

CNC machine tools must always be operated by fully trained personnel in accordance with the manufacturer's instructions.

Care of the probe

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

Patents

Features of the OLP40 probe, and other similar Renishaw probes, are the subject of one or more of the following patents and/or patent applications:

1.2

EP 0695926	JP 3967592
EP 0974208	JP 4237051
EP 1130557	JP 4294101
EP 1185838	JP 4754427
EP 1373995	JP 4773677
EP 1425550	JP 4851488
EP 1477767	US 5669151
EP 1477768	US 6776344
EP 1503524	US 6472981
EP 1701234	US 6839563
EP 1734426	US 6860026
EP 1804020	US 6941671
EP 1988439	US 7145468
	US 7441707
	US 7486195
	US 7812736

EC declaration of conformity



Renishaw plc declares that the OLP40 complies with the applicable standards and regulations.

Contact Renishaw plc or visit www.renishaw.com/olp40 for the full EC declaration of conformity.

WEEE directive



The use of this symbol on Renishaw products and/or accompanying documentation indicates that the product should not be mixed with general household waste upon disposal. It is the responsibility of the end user to dispose of this product at a designated collection point for waste electrical and electronic equipment (WEEE) to enable reuse or recycling. Correct disposal of this product will help to save valuable resources and prevent potential negative effects on the environment. For more information, please contact your local waste disposal service or Renishaw distributor.

FCC Information to user (USA only)

47 CFR 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, and
2. This device must accept any interference received, including interference that may cause undesired operation.

47 CFR 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.

47 CFR 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 the user will be required to correct the interference at his own expense.

Safety

Information to the user

The OLP40 is supplied with two non-rechargeable ½AA lithium-thionyl chloride batteries (approved to IEC 62133). Once the charge in these batteries is depleted, do not attempt to recharge them.



The use of this symbol on the batteries, packaging or accompanying documents indicates that used batteries should not be mixed with general household waste. Please dispose of the used batteries at a designated collection point. This will prevent potential negative effects on the environment and human health which could otherwise arise from inappropriate waste handling. Please contact your local authority or waste disposal service concerning the separate collection and disposal of batteries. All lithium and rechargeable batteries must be fully discharged or protected from short circuiting prior to disposal.

Please ensure replacement batteries are of the correct type and are fitted in accordance with the instructions in this manual (see Section 5, “Maintenance”), and as indicated on the product. For specific battery operating, safety and disposal guidelines, please refer to the battery manufacturers’ literature.

- Ensure that all batteries are inserted with the correct polarity.
- Do not store batteries in direct sunlight or rain.
- Do not heat or dispose of batteries in a fire.
- Avoid forced discharge of the batteries.
- Do not short-circuit the batteries.
- Do not disassemble, pierce, deform or apply excessive pressure to the batteries.
- Do not swallow the batteries.
- Keep the batteries out of the reach of children.
- Do not get batteries wet.

If a battery is damaged, exercise caution when handling it.

Please ensure that you comply with international and national battery transport regulations when transporting batteries or the products.

Lithium batteries are classified as dangerous goods and strict controls apply to their shipment by air. To reduce the risk of shipment delays, if you need to return the products to Renishaw for any reason, do not return any batteries.

The OLP40 has a glass window. Handle with care if broken to avoid injury.

Information to the machine supplier/installer

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 literature, 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 halt the movement of the machine.

Information to the equipment installer

All Renishaw equipment is designed to comply with the relevant EC and FCC regulatory requirements. It is the responsibility of the equipment installer to ensure that the following guidelines are adhered to, in order for the product to function in accordance with these regulations:

- any interface **MUST** be installed in a position away from any potential sources of electrical noise, i.e. power transformers, servo drives etc;
- all 0 V/ground connections should be connected to the machine “star point” (the “star point” is a single point return for all equipment ground and screen cables). This is very important and failure to adhere to this can cause a potential difference between grounds;
- all screens must be connected as outlined in the user instructions;

- cables must not be routed alongside high-current sources, i.e. motor power supply cables etc, or be near high-speed data lines;
- cable lengths should always be kept to a minimum.

Equipment operation

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Optical safety

This product contains LEDs that emit both visible and invisible light.

OLP40 is ranked Risk Group: Exempt (safe by design).

The product was evaluated and classified using the following standard:

BS EN 62471:2008	The photobiological safety of lamps and lamp systems.
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Renishaw recommends that you do not stare at or look directly into any LED device, irrespective of its risk classification.

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OLP40 basics

2.1

Introduction

The OLP40 is an optical lathe probe suitable for use on all sizes of lathes and small multi-tasking machines. It is designed to resist optical interference, false triggering and shock. It is supplied with an enhanced window and metal battery cassette.

The OLP40 can be operated in either 'Legacy' or 'Modulated' optical transmission modes – see probe settings for further details.

When operating in 'Legacy' mode, the OLP40 is compatible with an OMM receiver and an MI 12 interface, or with an OMI receiver/interface.

In 'Modulated' mode, the OLP40 becomes compatible for use with an OMM-2 receiver and an OSI interface, or with an OMI-2, OMI-2T or OMI-2H receiver/interface, to provide substantially increased resistance to light interference.

In 'Modulated' mode, it is possible to define the probe ID. This is factory set to PROBE 1, but can be changed to PROBE 2 for use with twin probes or PROBE 3 for use with multiple probe systems.

All OLP40 settings are configured using Trigger Logic™. This technique 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 multicolour probe LEDs provide visual indication of selected probe settings.

For example:

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

System interface

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

OMM-2 with OSI, OMI-2, OMI-2T or OMI-2H (modulated transmission)

The OMI-2T or OMM-2 with OSI are the recommended interfaces for use with the OLP40 as they provide substantially increased resistance to light interference whilst providing the user greater flexibility to operate a multiple probe system.

OMI or OMM with MI 12 (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 the OLP40.

Trigger Logic™

Trigger Logic™ (see Section 4, “Trigger Logic™”) is a method that allows the user to view and select all available mode settings in order to customise a probe to suit a specific application. Trigger Logic is activated by battery insertion and uses a sequence of stylus deflections (triggering) to systematically lead the user through the available choices to allow selection of the required mode options.

Current probe settings can be reviewed by simply removing the batteries for a minimum of 5 seconds and then replacing them, which activates the Trigger Logic review sequence.

Probe modes

The OLP40 probe can be in one of three modes:

Standby mode – probe is waiting for a switch-on signal.

Operational mode – when activated by one of the switch-on methods, the probe is switched on and ready for use.

Configuration mode – ready to change the probe settings using Trigger Logic™.

NOTE: A visual indication of currently selected probe settings is provided on battery insertion, by the three multicolour LEDs located within the probe window (see Section 4, “Trigger Logic™”).

Configurable settings

Switch-on / switch-off methods

The following switch-on / switch-off options are user-configurable.

1. Optical on / Optical off
2. Optical on / Timer off

OLP40 switch-on method Switch-on options are configurable	OLP40 switch-off method Switch-off options are configurable	Switch-on time
Optical on Optical switch-on is commanded by machine input.	Optical off Optical switch-off is commanded by machine input. A timer automatically switches the probe off 90 minutes after the last trigger if it is not turned off by machine input.	Legacy (start filter off): 0.5 seconds Legacy (start filter on): 1 second Modulated: 0.5 seconds
Optical on Optical switch-on is commanded by machine input or auto start.	Timer off (timeout) Timeout will occur 12, 33 or 134 seconds (user configurable) after the last probe trigger or reseal. Please note that the issue of a further M-code during the timeout period, will also reset the timer.	

Enhanced trigger filter

Probes subjected to high levels of vibration or shock loads may output probe trigger signals without having contacted any surface. The enhanced trigger filter improves the probe's resistance to these effects.

When the filter is enabled, a constant nominal 10 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 OLP40 can be operated in either 'Legacy' or 'Modulated' optical transmission mode.

Legacy mode

A start filter improves the probe's resistance to these effects.

When Legacy (start filter on) is enabled, an additional one second 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.

Modulated mode

The OLP40 becomes compatible for use with the OMM-2 with OSI, OMI-2, OMI-2T or OMI-2H to provide substantially increased resistance to light interference.

Modulated transmission in the OLP40, is capable of providing three different coded start signals. This allows the use of two probes with an OMI-2T and up to three probes with an OMM-2 with OSI system respectively.

Twin / multiple probe system

To operate in a twin or multiple probe system, one probe needs to be set to PROBE 1 start and the other probe needs to be set to PROBE 2 start (OMI-2T or OMM-2 with OSI) or PROBE 3 start (OMM-2 with OSI only). These settings are user configurable.

In a twin probe system, such as a spindle probe and an optical tool setting probe, the spindle probe needs to be set to PROBE 1 start and the tool setter to PROBE 2 start.

In a multiple probe system, with two spindle probes and one optical tool setting probe, the two spindle probes needs to be set to PROBE 1 and PROBE 2 start, respectively, and the tool setter would be set to PROBE 3 start.

Optical power

Where the separation between the OLP40 and the OMM-2 with OSI / OMI-2 / OMI-2T / OMI-2H / OMM with MI 12 is small, low optical power may be used. In this setting, the optical transmission range will be reduced as shown on the performance envelopes so that battery life will be extended.

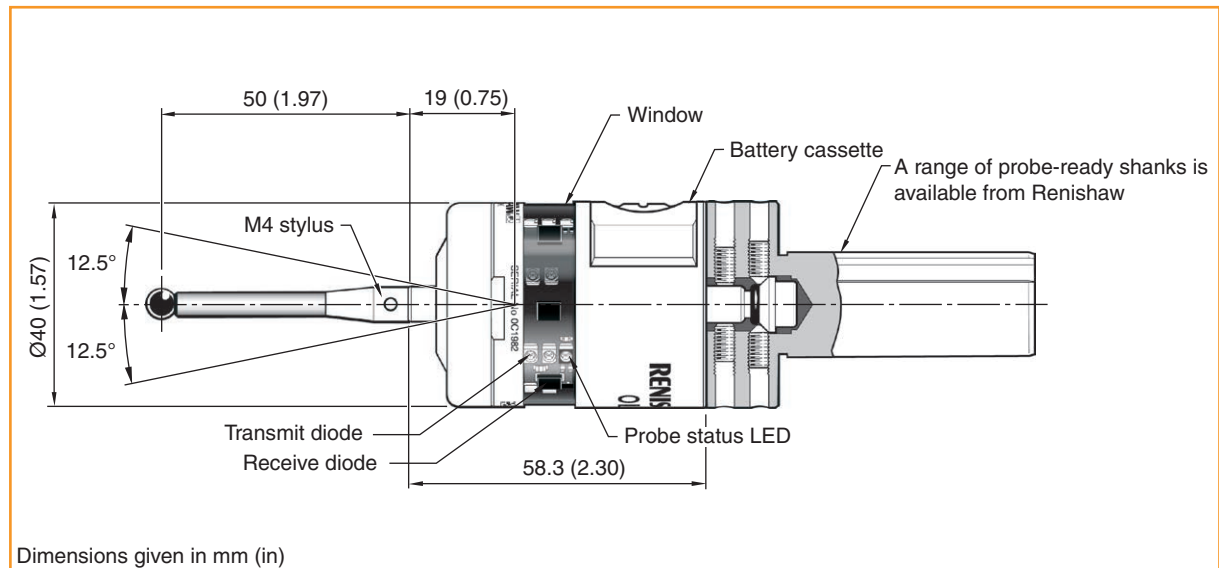
Dotted lines on the performance envelopes represent the OLP40 in low optical power.

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.

The probe is factory set to standard optical power.

OLP40 dimensions



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)

OLP40-2 specification

Principal application	Workpiece inspection and job set-up on all sizes of lathes and small multi-tasking machines.	
Dimensions	Length	58.3 mm (2.30 in)
	Diameter	40 mm (1.57 in)
Weight (without shank)	With batteries	277 g (9.77 oz)
	Without batteries	258 g (9.10 oz)
Transmission type	360° infrared optical transmission (modulated or legacy)	
Switch-on methods	Optical on	
Switch-off methods	Optical off or Timer off	
Spindle speed (maximum)	1000 rev/min	
Operating range	Up to 5 m (16.4 ft)	
Compatible receiver / interface	Modulated OSI with OMM-2, OMI-2, OMI-2T or OMI-2H	Legacy OMI, OMM with MI 12
Sense directions	±X, ±Y, +Z	
Unidirectional repeatability	1.00 µm (40 µin) 2σ (see note 1)	
Stylus trigger force (see notes 2 and 3) Factory setting: XY low force XY high force Z	0.40 N, 41 gf (1.44 ozf) 0.80 N, 80 gf (2.88 ozf) 5.30 N, 540 gf (19.06 ozf)	
Stylus overtravel	XY plane	±12.5°
	+Z plane	6 mm (0.24 in)
Environment	IP rating	IPX8 (EN/IEC 60529)
	IK rating	IK01 (EN/IEC 62262) [for glass window]
	Storage temperature	-25 °C to +70 °C (-13 °F to +158 °F)
	Operating temperature	+5 °C to +55 °C (+41 °F to +131 °F)
Battery types	2 x ½ AA 3.6 V lithium-thionyl chloride (LTC)	
Battery reserve life	Approximately one week after a low battery warning is first given (based on 5% usage).	
Typical battery life	See page 2.7	

Note 1 Performance specification is tested at a standard test velocity of 480 mm/min (18.9 in/min) with a 50 mm stylus. Significantly higher velocity is possible depending on application requirements.

Note 2 Trigger force, which is critical in some applications, is the force exerted on the component by the stylus when the probe triggers. The maximum force applied will occur after the trigger point, i.e. overtravel. The force value depends on related variables, including measuring speed and machine deceleration.

Note 3 These are the factory settings, manual adjustment is possible.

Typical battery life

Modulated transmission		
2 x ½AA 3.6 V LTC batteries (typical)	Standard power	Low power
Standby life	430 days	
5% usage	140 days	180 days
Continuous use	250 hours	350 hours

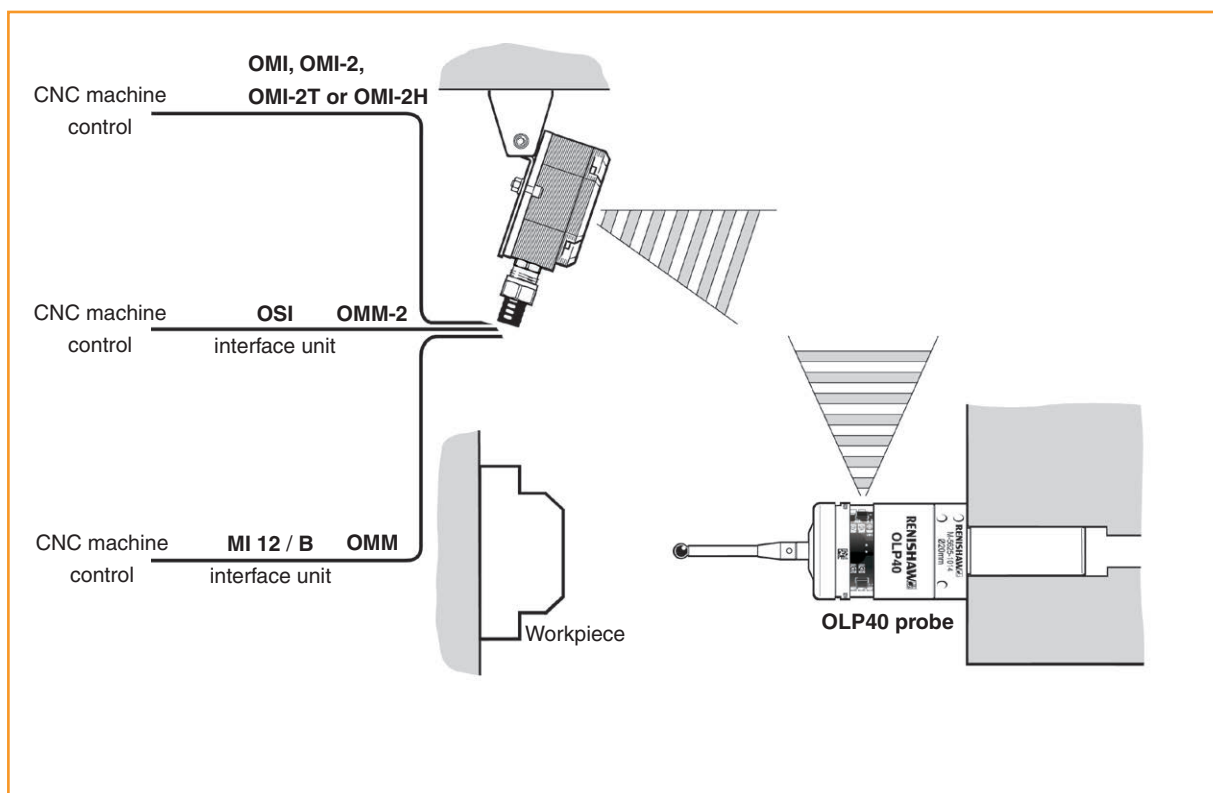
Legacy transmission		
2 x ½AA 3.6 V LTC batteries (typical)	Standard power	Low power
Standby life	430 days	
5% usage	160 days	190 days
Continuous use	300 hours	390 hours

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System installation

3.1

Installing the OLP40 with an OMM-2, OMI-2T, OMI-2H, OMI-2, OMI or OMM



Operating envelope

The OLP40 and OMI or OMM with MI 12 system uses legacy transmission. The OLP40 and OMM-2 with OSI, OMI-2T, OMI-2H or OMI-2 system uses modulated transmission.

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

Coolant and swarf residue accumulating on the probe or receiver/interface windows will have a detrimental effect on transmission performance. Wipe clean as often as necessary to maintain unrestricted transmission.

CAUTION: If two or more systems are operating in close proximity to each other, take care to ensure that signals transmitted from the OLP40 on one machine are not received by the receiver on the other machine, and vice versa. When this is the case it is recommended that the OLP40 low optical power is used and that the low range setting is used on the receiver.

OMM-2, OMI-2T, OMI-2H, OMI-2, OMI or OMM positioning

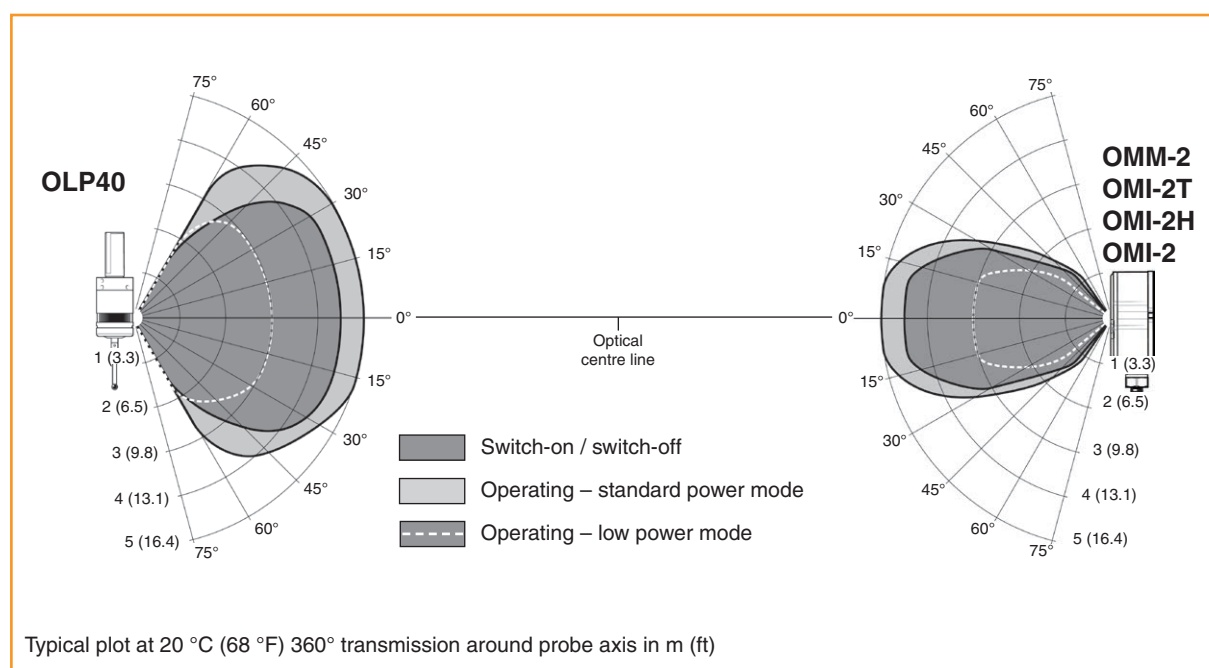
To assist in finding the optimum position for the OMM-2, OMI-2T, OMI-2H or OMI-2, the signal condition is displayed on a multi-coloured LED.

To assist in finding the optimum position for the OMI, the signal strength is displayed on an OMI multicoloured LED.

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

Performance envelope with an OMM-2, OMI-2T, OMI-2H or OMI-2 (modulated transmission)

The probe and OMM-2, OMI-2T, OMI-2H or OMI-2 diodes must be in each other's field of view and within the performance envelope shown. The OLP40 performance envelope is based on the OMM-2, OMI-2T, OMI-2H or OMI-2 being at 0° and vice versa.



Preparing the OLP40 for use

Fitting the stylus



Stylus weak link

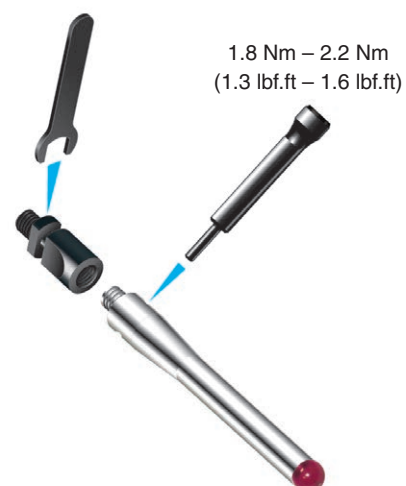
NOTE: Must be used with steel styli. For optimum metrology performance do not use a weak link with ceramic or carbon fibre styli.

Fitting a stylus with a weak link onto the OLP40

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.

1



2



Removing a broken weak link



Installing the batteries

NOTES:

See Section 5, “Maintenance” for a list of suitable battery types.

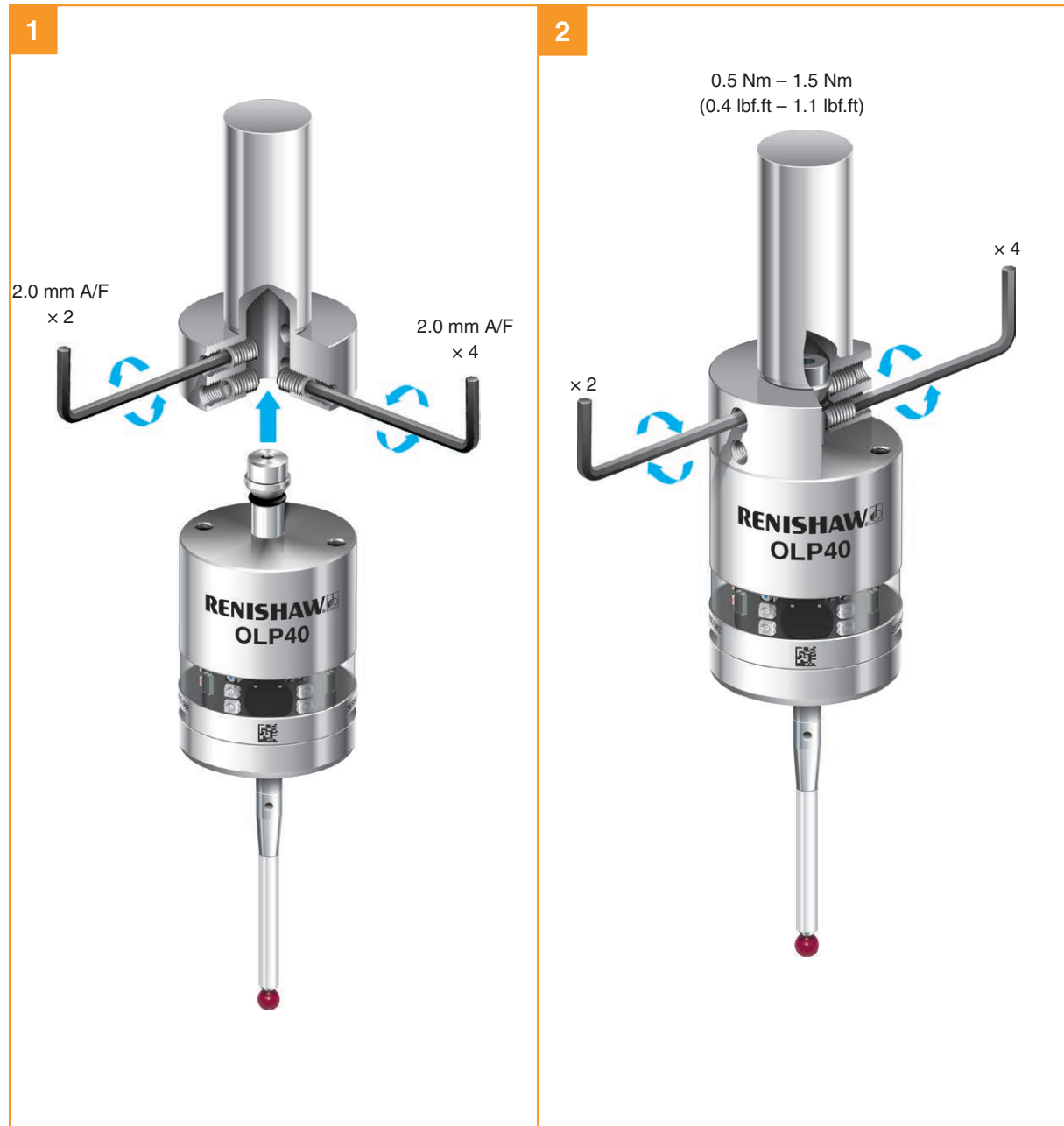
If dead batteries are inadvertently inserted, the LEDs will remain a constant red.

Do not allow coolant or debris to enter the battery compartment. When inserting batteries, check that the battery polarity is correct.

After the batteries have been inserted, the LEDs will display the current probe settings (for details, see Section 4, “Trigger Logic™”).



Mounting the probe on a shank



Stylus on-centre adjustment

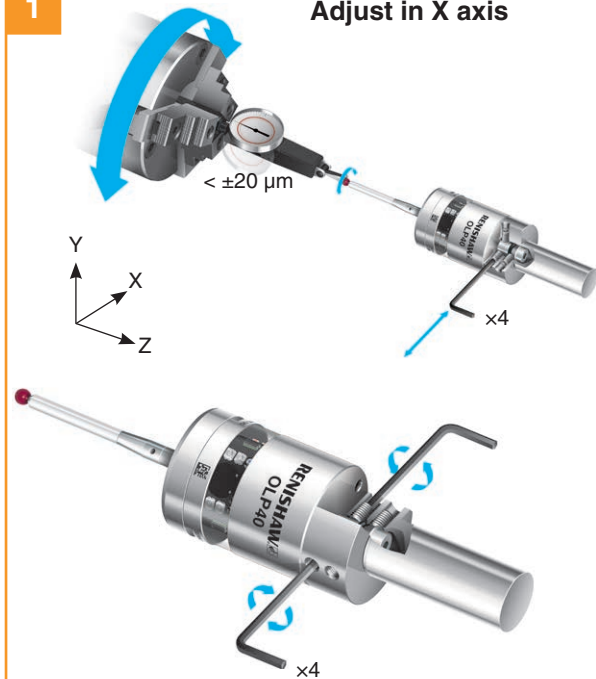
NOTES:

If a probe and shank assembly is dropped, it must be rechecked for correct on-centre adjustment.

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

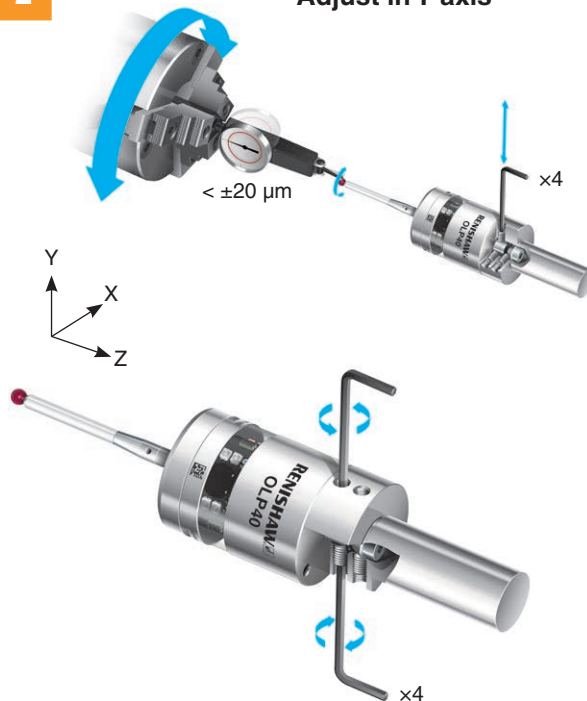
1

Adjust in X axis

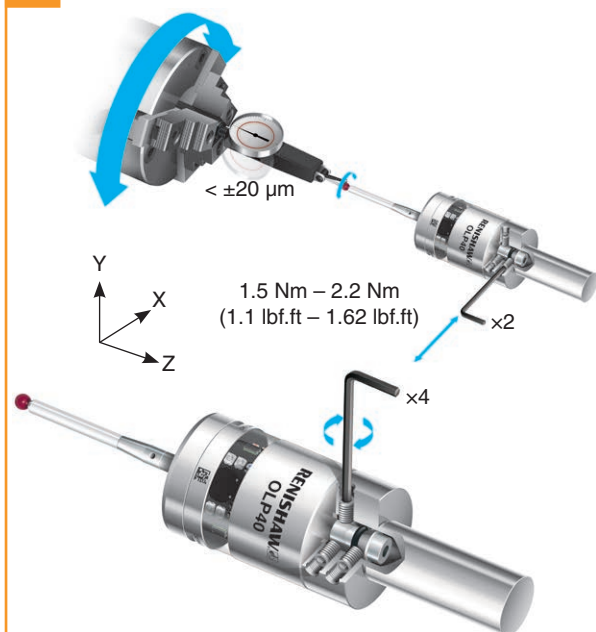


2

Adjust in Y axis



3



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. where there is excessive machine vibration or insufficient force to support the stylus weight.

To adjust the trigger force, turn the adjusting screw anticlockwise (as shown) to reduce the force (more sensitive); eventually it reaches a stop. Turn the adjusting screw clockwise (as shown) to increase the force (less sensitive). If the internal screw becomes disengaged, remove any pressure on the stylus and turn the key anticlockwise to re-engage the thread.

Trigger forces in the XY plane vary around the stylus and depend on trigger direction.

Stylus trigger force adjustment and use of styli other than test stylus types may cause probe repeatability to differ from the calibration certificate results.

Factory setting

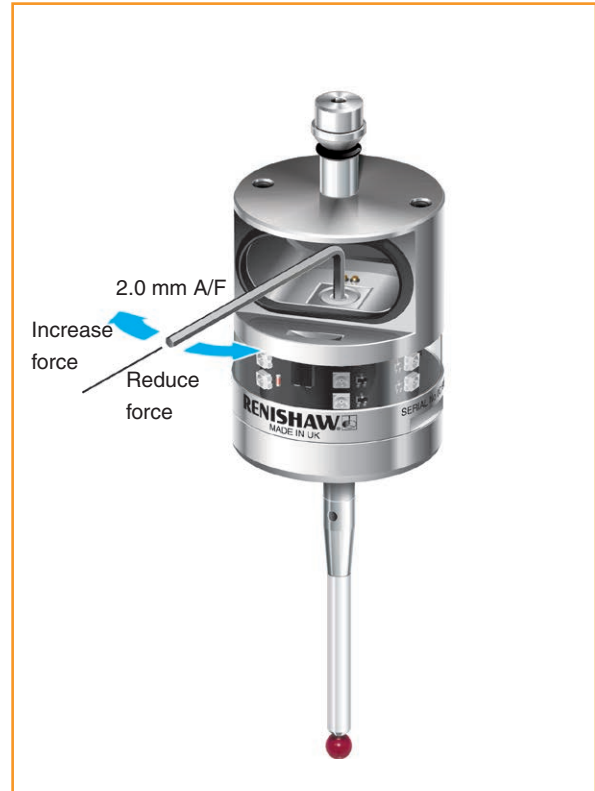
XY low force	0.40 N / 41 gf (1.44 ozf)
XY high force	0.80 N / 80 gf (2.88 ozf)
Z	5.30 N / 540 gf (19.06 ozf)

Maximum setting

XY low force	0.80 N / 80 gf (2.88 ozf)
XY high force	1.60 N / 160 gf (5.76 ozf)
Z	10.0 N / 1000 gf (35.96 ozf)

Minimum setting

XY low force	0.30 N / 30 gf (1.08 ozf)
XY high force	0.6 N / 60 gf (2.16 ozf)
Z	4.0 N / 400 gf (14.39 ozf)



Calibrating the OLP40

Why calibrate a probe?

An inspection probe is just one component of the measurement system which communicates with the machine tool. Each part of the system can introduce a constant difference between the position that the stylus touches and the position that is reported to the machine. If the probe is not calibrated, this difference will appear as an inaccuracy in the measurement. Calibration of the probe allows the probing software to compensate for this difference.

During normal use, the difference between the touch position and the reported position does not change, but it is important that the probe is calibrated in the following circumstances:

- when a probe system is to be used for the first time;
- when the enhanced trigger filter delay is changed;
- when a new stylus is fitted to the probe;
- when it is suspected that the stylus has become distorted or that the probe has been crashed;
- at regular intervals to compensate for mechanical changes of your machine tool;
- if repeatability of relocation of the probe shank is poor. In this case, the probe may need to be recalibrated each time it is selected.

On lathes without a Y axis, it is important to set the tip of the stylus to the spindle centre line, (see “Stylus on-centre adjustment” earlier in this section), to ensure that the measurement is made on the full diameter of the hole/ring or shaft/ball. Otherwise the resulting (cosine) error will be proportional to the difference between the calibration diameter and the current feature diameter. This effect is only large enough to detect on diameters less than 50 mm (1.97 in). On larger diameters it can safely be ignored.

On lathes with a Y axis an additional adjustment to the Y axis position can be made prior to measurement to ensure that the stylus tip is on the spindle centre line.

Three different operations are to be used when calibrating a probe. They are:

- calibrating either in a bored hole or on a turned diameter of known position;
- calibrating either in a ring gauge or on a datum sphere;
- calibrating the probe length.

Calibrating in a bored hole or on a turned diameter

Calibrating a probe, either in a bored hole or on a turned diameter of known size, automatically stores values for the offset of the stylus ball to the spindle centre line. The stored values are then used automatically in the measuring cycles. Measured values are compensated by these values so that they are relative to the true spindle centre line.

Calibrating in a ring gauge or on a datum sphere

Calibrating a probe either in a ring gauge or on a datum sphere with a known diameter automatically stores one or more values for the radius of the stylus ball. The stored values are then used automatically by the measuring cycles to give the true size of the feature. The values are also used to give true positions of single surface features.

NOTE: The stored radius values are based on the true electronic trigger points. These values are different from the physical sizes.

Calibrating the probe length

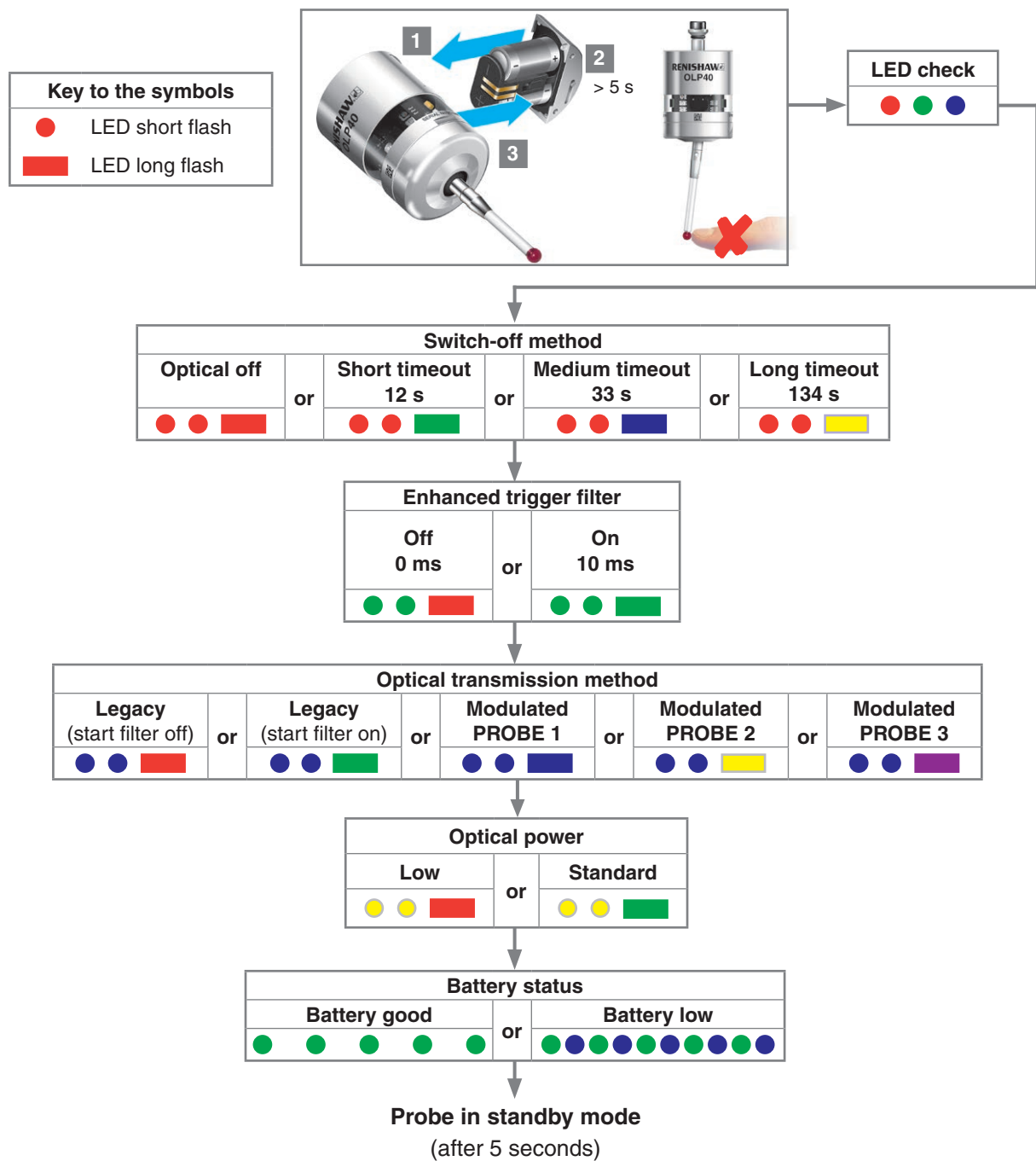
Calibrating a probe on a known reference surface determines the length of the probe, based on the electronic trigger point. The stored value for length is different from the physical length of the probe assembly. Additionally, the operation can automatically compensate for machine and fixture height errors by adjusting the probe length value that is stored.

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Trigger Logic™














4.1

Reviewing the probe settings



Probe settings record

This page is provided to note your probe's settings.

			✓ tick	✓ tick
			Factory settings	New settings
Switch-on method	Optical switch-on		✓	
	Optical off		✓	
Switch-off method	Short timeout (12 s)			
	Medium timeout (33 s)			
	Long timeout (134 s)			
Enhanced trigger filter	Off (0 ms)		✓	
	On (10 ms)			
Optical transmission method	Legacy (start filter off)			
	Legacy (start filter on)			
	Modulated PROBE 1		✓	
	Modulated PROBE 2			
	Modulated PROBE 3			
Optical power	Low			
	Standard		✓	

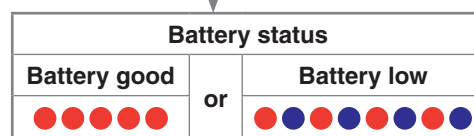
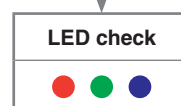
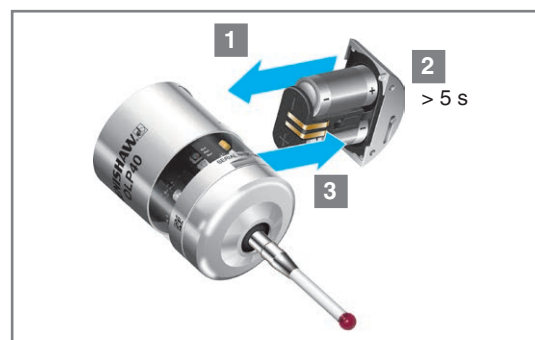
Factory settings are for kit (A-5625-2001) only.






OLP40 serial no

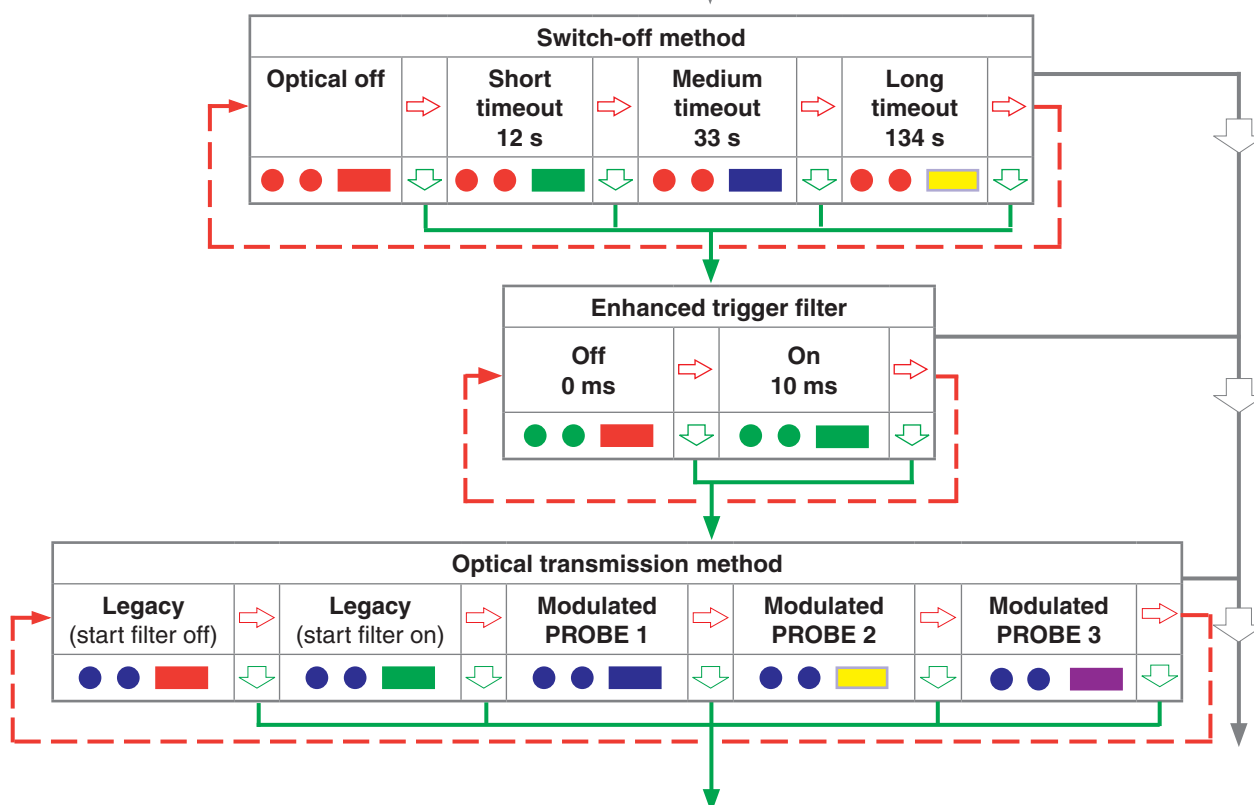
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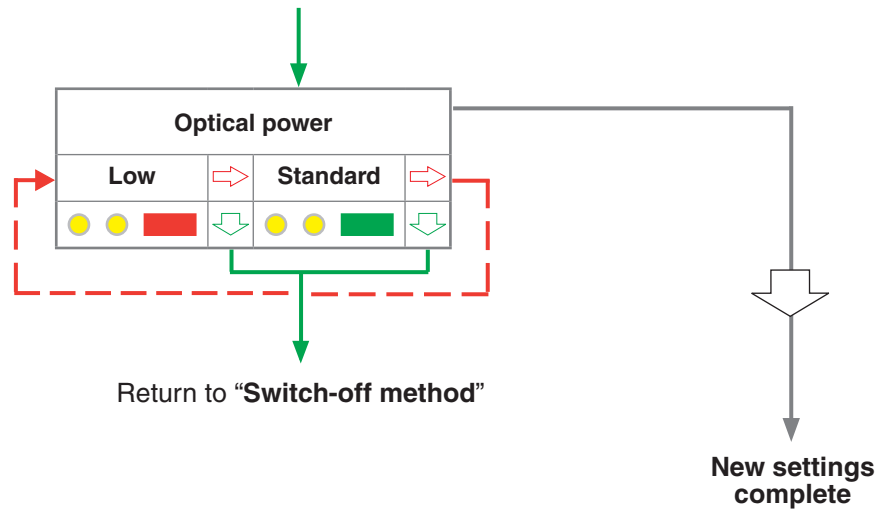
Following the LED check, immediately deflect the stylus and hold it deflected until five red flashes have been observed (if the battery power is low, each red flash will be followed by a blue flash).

CAUTION: Do not remove the batteries whilst in configuration mode. To exit, leave the stylus untouched for more than 20 seconds.

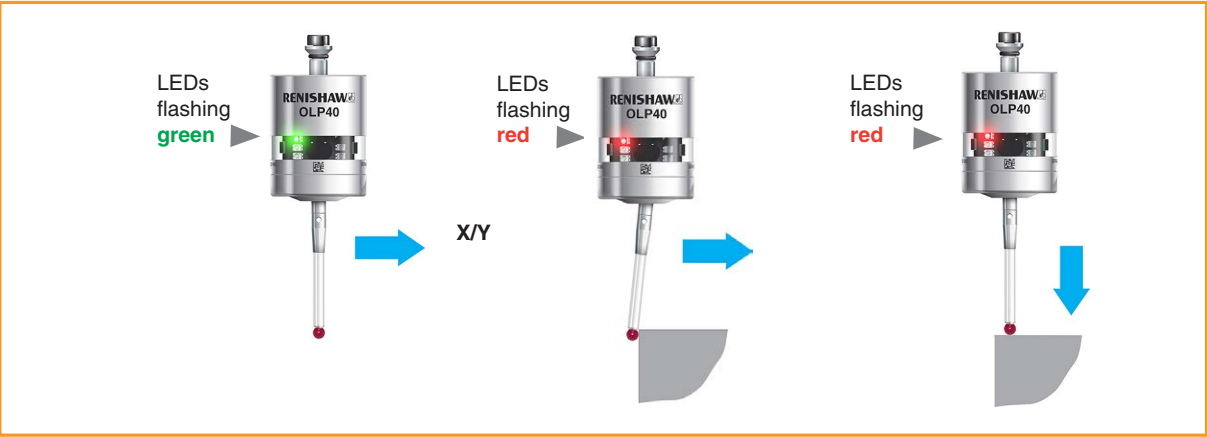


Key to the symbols	
	LED short flash
	LED long flash
	Deflect the stylus for less than 4 seconds to move to the next menu option.
	Deflect the stylus for more than 4 seconds to move to the next menu.
	To exit, leave the stylus untouched for more than 20 seconds.





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 red	Battery dead	■
Flashing red or Flashing red and green or Sequence when batteries are inserted	Unsuitable battery	● ● ● ● ● ● ● ● ● ● ● ● ● ● ●

- NOTE:** Due to the nature of lithium-thionyl chloride batteries, if a “low battery” LED warning is ignored, it is possible for the following sequence of events to occur:

 - When the probe is active, the batteries discharge until battery power becomes too low for the probe to operate correctly.
 - The probe stops functioning, but then reactivates as the batteries recover sufficiently to provide the probe with power.
 - The probe begins to run through the LED review sequence (see “Reviewing the probe settings” in Section 4, “Trigger Logic™”).
 - Again, the batteries discharge and the probe ceases to function.
 - Again, the batteries recover sufficiently to provide the probe with power, and the sequence repeats itself.

Maintenance

5.1

Maintenance

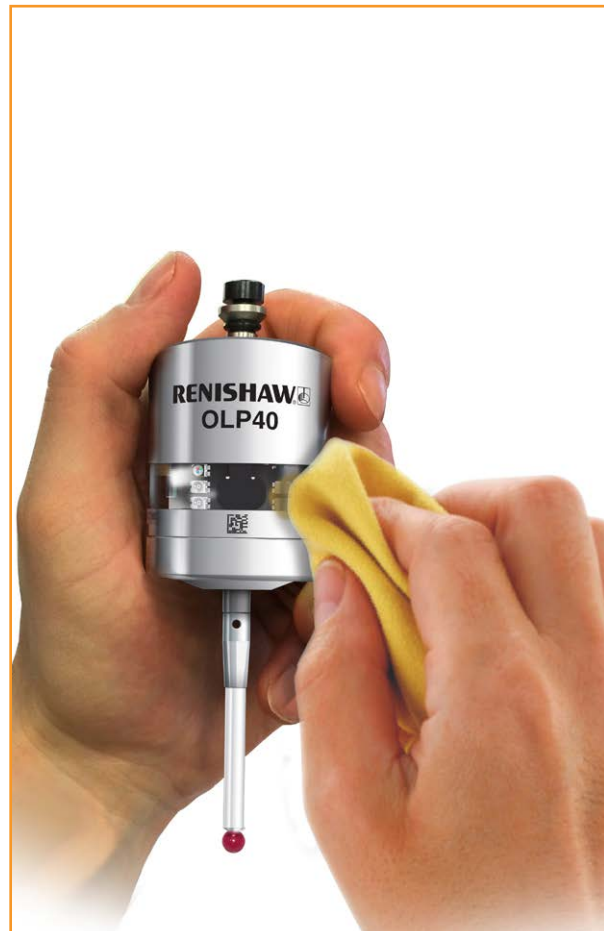
You may undertake the maintenance routines described in these instructions.

Further dismantling and repair of Renishaw equipment is a highly specialised operation, which must be carried out at an authorised Renishaw Service Centre.

Equipment requiring repair, overhaul or attention under warranty should be returned to your supplier.

Cleaning the probe

Wipe the window of the probe with a clean cloth to remove machining residue. This should be done on a regular basis to maintain optimum transmission.



CAUTION: The OLP40 has a glass window. Handle with care if broken to avoid injury.

Changing the batteries

1

**CAUTIONS:**

Do not leave dead batteries in the probe.

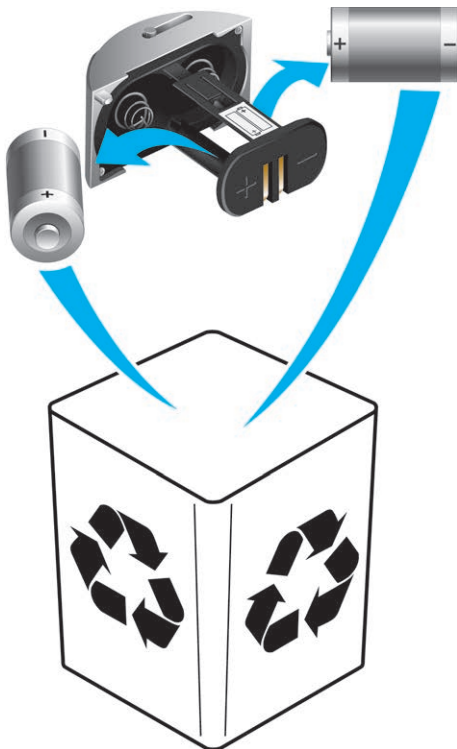
When changing batteries, do not allow coolant or debris to enter the battery compartment.

When changing batteries, check that the battery polarity is correct.

Take care to avoid damaging the battery cassette gasket.

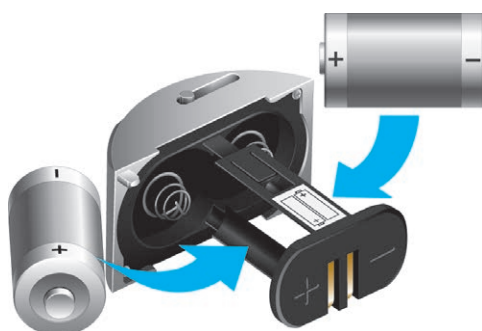
Only use specified batteries.

2



CAUTION: Please dispose of dead batteries in accordance with local regulations. Never dispose of batteries in a fire.

3



NOTES:

After removing the old batteries, wait more than 5 seconds before inserting the new batteries.

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.

If dead batteries are inadvertently inserted, the LEDs will remain a constant red.

Battery type					
½ AA lithium-thionyl chloride (3.6 V) × 2					
✓	Ecocel:	EB1426	✗	Dubilier:	SB-AA02
	Saft:	LS 14250C LS 14250		Maxell:	ER3S
	Tadiran:	SL-750		Sanyo:	CR 14250SE
	Xeno:	XL-050F		Tadiran:	SL-350, SL-550, TL-4902, TL-5902, TL-2150, TL-5101
				Varta:	CR ½AA

4



5



OLP40 eyelid

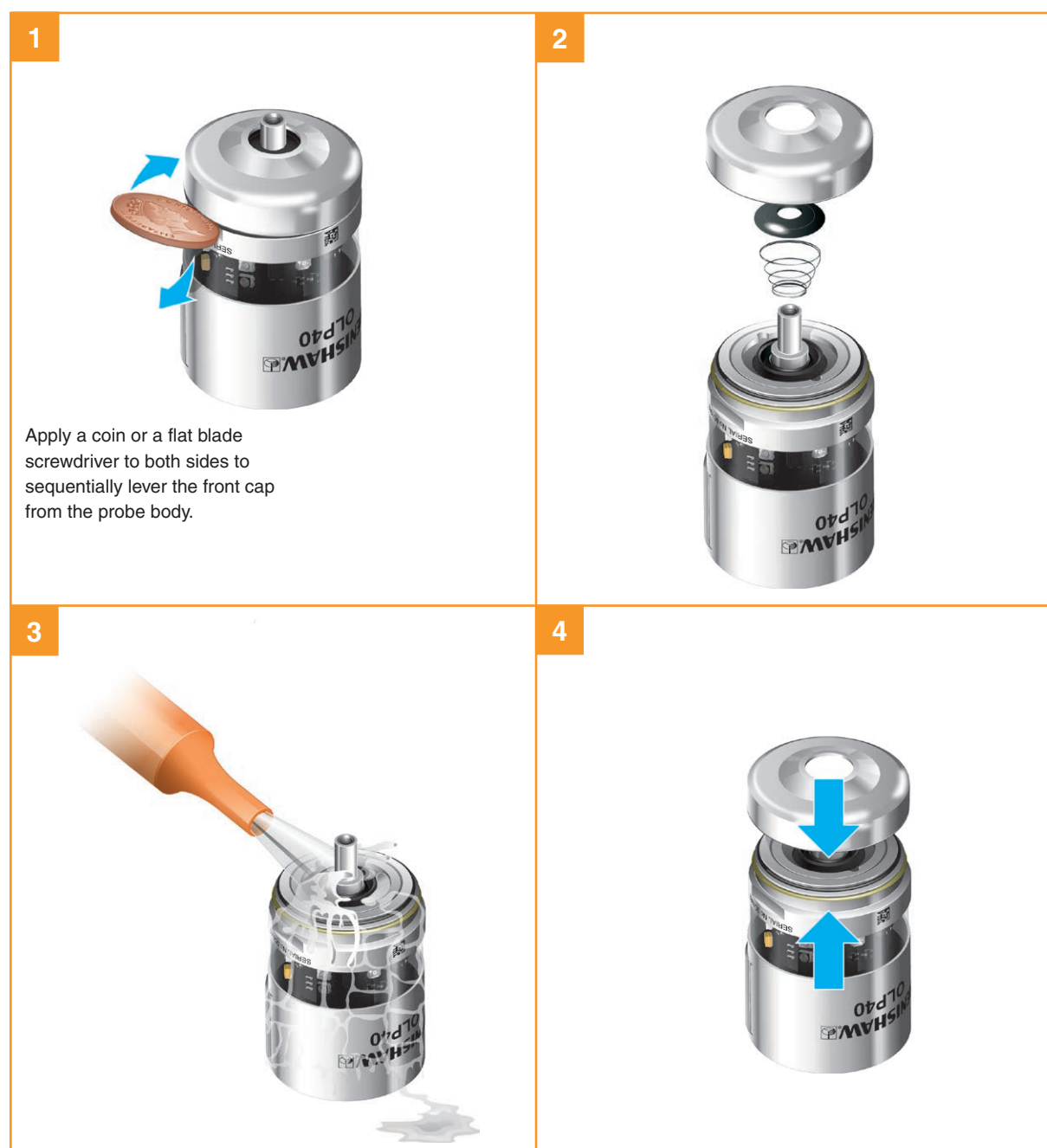
The OLP40 is fitted with a metal eyelid that protects the internal components of the probe from hot chip and coolant environment. Dirt may accumulate in the cavity underneath the metal eyelid seal.

To remove this dirt, once a month, remove the front cap (using a flat blade screwdriver or a coin) and then remove all of the residue with a low-pressure jet of coolant.

Do not use a sharp tool or a degreasing agent. The cleaning interval may be extended or reduced, depending on the rate at which dirt accumulates. If the inner diaphragm is damaged, return the probe to your supplier for repair.

Reassembling the probe

DO NOT use the probe with the cap removed. Check that the probe is firmly secured in its mounting.



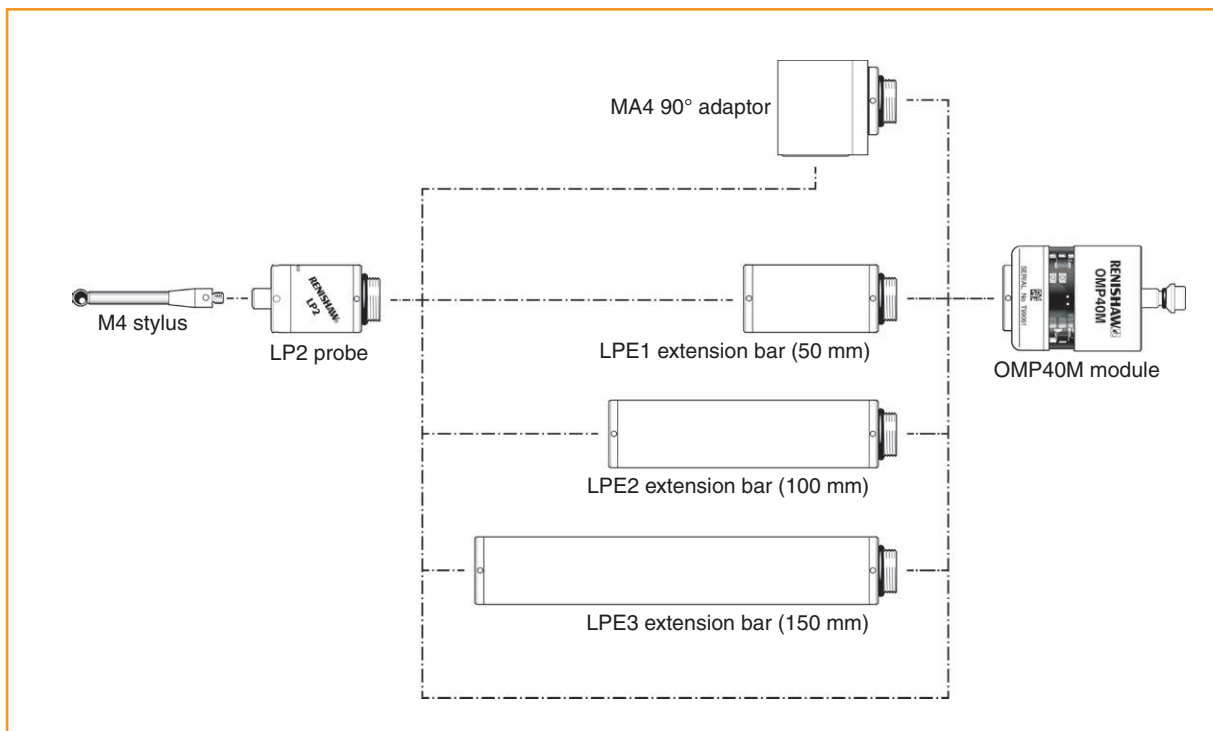
OMP40M system

6.1

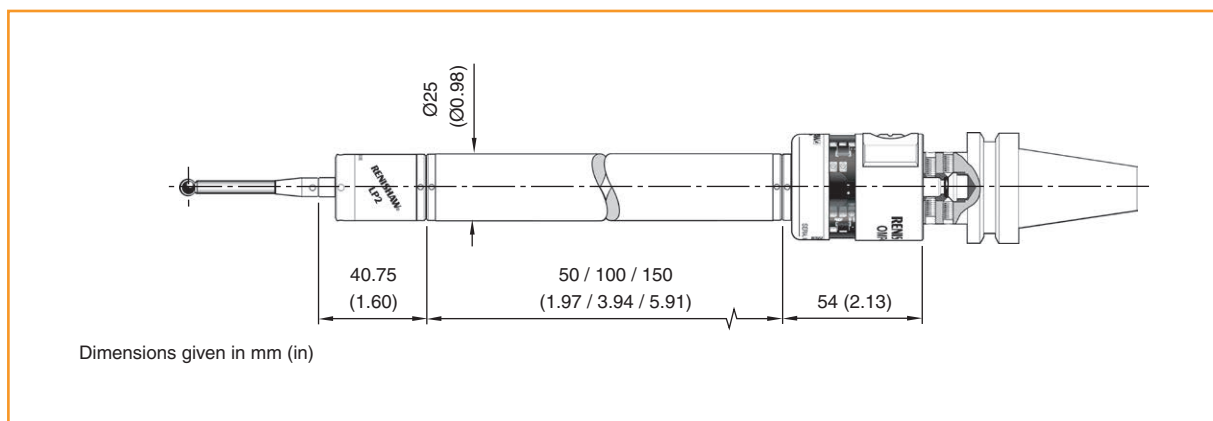
OMP40M system

The OMP40M is a special modular version of the OLP40. It enables probe inspection of part features inaccessible to the OLP40, by the fitting of selected adaptors and extensions as shown below.

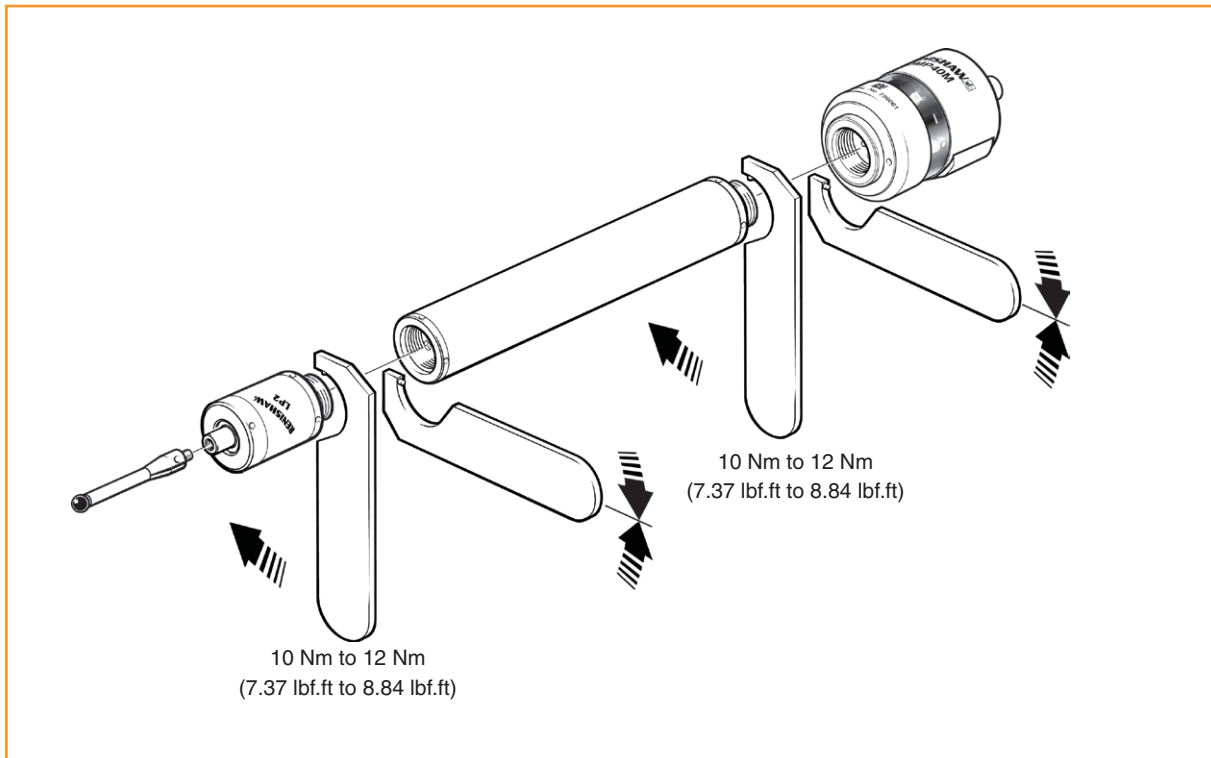
See Section 8, "Parts list".



OMP40M dimensions



OMP40M screw torque values



Fault-finding

7.1

Symptom	Cause	Action
Probe fails to power up (no LEDs illuminated or fails to indicate current probe settings).	Dead batteries.	Change batteries.
	Unsuitable batteries.	Change batteries.
	Batteries inserted incorrectly.	Check battery insertion/polarity.
	Batteries removed for too short a time and probe has not reset.	Remove batteries for a minimum of 5 seconds.
	Poor connection between battery cassette mating surfaces and contacts.	Remove any dirt and clean the contacts before reassembly.
Probe fails to switch on.	Wrong transmission mode selected.	Reconfigure transmission mode.
	Dead batteries.	Change batteries.
	Unsuitable batteries.	Change batteries.
	Batteries inserted incorrectly.	Check battery insertion/polarity.
	Optical/magnetic interference.	Check for interfering lights or motors.
	Transmission beam obstructed.	Check that the OLP40 and receiver windows are clean and remove any obstruction.
	Probe out of range/not aligned with receiver.	Check alignment and that receiver fixing is secure.
	No receiver start signal.	Check start signal by reviewing receiver start LED. Refer to relevant user's guide.

Symptom	Cause	Action
Machine stops unexpectedly during a 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.	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 adjacent probe to low power mode and reduce range of receiver.
Probe crashes.	Workpiece obstructing probe path.	Review probing software.
	Probe length offset missing.	Review probing software.
	Controller wired to respond to tool setter instead of inspection probe.	Review installation wiring.

Symptom	Cause	Action
Poor probe repeatability and/or accuracy.	Debris on part and/or stylus.	Clean part and/or 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.	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.
	Calibration feature has moved.	Correct the position.
	Measurement occurs as stylus leaves surface.	Review probing software.
	Measurement occurs within the machine's acceleration and deceleration zone.	Review probing software and probe filter settings.
	Probing speed too high or too slow.	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 tool.

Symptom	Cause	Action
Probe fails to switch off.	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 consider upgrading to modulated system.
	Transmission beam obstructed.	Check that the probe and receiver windows are clean, and remove any obstruction.
Probe fails to switch off (where timer off is required).	Incorrect switch-off method configured.	Check configuration and alter as required.
	Probe placed in carousel when in timeout mode. Timer can be reset by carousel activity.	Consider using a carbon fibre stylus.
		Enable enhanced trigger filter.
		Shorten timeout setting.
		Consider use of optical on/optical off setting.

Parts list

8.1

Item	Part number	Description
OLP40	A-5625-2001	OLP40 probe with batteries, tool kit and quick-start guide (set to optical on / optical off) – modulated transmission, PROBE 1 start.
OLP40	A-5625-2002	OLP40 probe with batteries, tool kit and quick-start guide (set to optical on / time off 134 sec) – modulated transmission, PROBE 1 start.
Stylus	A-5000-3709	PS3-1C ceramic stylus 50 mm long with Ø6 mm ball.
Batteries	P-BT03-0007	½AA lithium-thionyl chloride (LTC) batteries (pack of two).
Battery cassette	A-5625-1166	OLP40 metal battery cassette assembly.
Seal	A-4038-0301	Seal for OLP40 battery cassette.
Tool kit	A-4071-0060	Probe tool kit comprising: Ø1.98 mm stylus tool, 2.0 mm A/F hexagon key and shank grubscrews (x6).
Styli tool	M-5000-3707	Tool for tightening/releasing styli.
OMI-2	A-5191-0049	OMI-2 complete with cable 8 m (26.25 ft) long.
OMI-2	A-5191-0050	OMI-2 complete with cable 15 m (49.21 ft) long.
OMI-2T	A-5439-0049	OMI-2T complete with cable 8 m (26.25 ft) long.
OMI-2T	A-5439-0050	OMI-2T complete with cable 15 m (49.21 ft) long.
OMM-2	A-5492-0049	OMM-2 with 8 m (26.25 ft) cable, tool kit and quick-start guide.
OSI interface	A-5492-2000	OSI (Multiple Probe Mode) with DIN rail mounting, terminal block and quick-start guide
OSI interface	A-5492-2010	OSI (Single Probe Mode) with DIN rail mounting, terminal block and quick-start guide.
Eyelid service kit	A-5625-0005	OLP40 eyelid service kit.
Weak link kit	A-2085-0068	Weak link (part no. M-2085-0009 × 2) and 5.0 mm A/F spanner.
Mounting bracket	A-2033-0830	Mounting bracket with fixing screws, washers and nuts.
Shank	A-5625-1003	Parallel shank kit Ø25 mm.
Shank	A-5625-1007	Parallel shank kit Ø1 in.
OMP40M module	A-5626-2001	OMP40M module with batteries, tool kit and quick-start guide (set to optical on / optical off) – modulated transmission, PROBE 1 start.

Item	Part number	Description
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.
LP2	A-2063-6098	LP2 probe complete with two C spanners and TK1 tool kit.
Publications. These can be downloaded from our website at www.renishaw.com .		
OLP40	A-5625-8500	Quick-start guide: for rapid set-up of the OLP40 probe (includes CD with installation guides).
OMI-2	A-5191-8500	Quick-start guide: for the rapid set-up of the OMI-2 (includes CD with installation guides).
OMI-2T	A-5439-8500	Quick-start guide: for the rapid set-up of the OMI-2T (includes CD with installation guides).
OMM-2	A-5492-8550	Quick-start guide: for the rapid set-up of the OMM-2 (includes CD with installation guides).
OSI	A-5492-8500	Quick-start guide: for the rapid set-up of the OSI interface (includes CD with installation guides).
OMI	H-2000-5062	Installation and user's guide: OMI – Optical machine interface.
OMM	H-2000-5044	Installation and user's guide: OMM – Optical machine module.
MI 12	H-2000-5073	Installation and user's guide: MI 12 machine interface.
Styli	H-1000-3200	Technical specifications guide: Styli and accessories.
Software features	H-2000-2289	Data sheet: Probe software for machine tools – illustrated features.
Software list	H-2000-2298	Data sheet: Probe software for machine tools – list of programs.
Parallel shanks	H-2000-2377	Data sheet: Parallel shanks for lathe probes.

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