LP2 modular probe system for tool setting and workpiece inspection

LP2 probe systems include a wide range of stylus and accessories to provide customised installations.

LP2 compact probes are sealed for use within the machine's hostile environment of coolant and hot metal chips.

H versions have a higher spring force, which allows use of longer stylus, and greater resistance to machine vibration.

DD versions are specified for applications subject to particle laden coolant. The diaphragm material is resistant to coolants and elevated temperatures. However, if the probe is subjected to continual exposure to hot metal chips, use of the swarf deflector is recommended.

System features

Principal application
- Horizontal lathes
  Small enough to fit on turret for part measuring, tool setting and broken tool detection when mounted in a suitable position.
- Machining centre applications
  Set-up and part measuring when spindle mounted. Tool setting and broken tool detection when table mounted.

Compact and robust
Ø25 x 40.8 mm long (Ø0.98 x 1.6 in long).

Swarf deflector (optional)

Probe sealing
Sealed to IPX8.

Repeatability
Inherent repeatability with all stylus configurations.

Stylus weak link protects probe in event of a collision (optional)

Signal transmission systems
- Hard wired - for machining centres with manual tool change. The LP2 is used with the MA2 probe holder.
- Inductive - for machining centres and lathes, eliminates the need for probe batteries.
- Optical - for lathes. Easy installation, particularly in retrofit applications as there is no need for prepared passageways required for inductive transmission cables. The LP2 fits onto LTO2/LTO2S/LTO2T/LTO3T optical modules.

Software for probe routines
- Renishaw supplies an extensive suite of probing routines for the majority of machine controllers.

Modular extensions and adaptors
Provide ready made installation solutions.
**LP2 system**

Representative examples of the LP2 modular system are shown below. More comprehensive information is provided on the Data sheets listed on the next page. Please consult your local supplier for installation advice.

**Maintenance**

The probe system requires only minimum maintenance. Periodically clean the probe's front seal and check the security of wiring.

**Stylus alignment**

Workpiece inspection Adaptors and holders incorporate adjusters to enable the stylus to be aligned with the spindle centre line.

**Tool setting**

Square tip styli can be adjusted to align with the machine’s X/Y axes. Further fine rotational adjustment is provided with probe socket FS1.

**Abbreviations**

CMM Contact module machine  
CMP Contact module probe  
IMM Inductive module machine  
IMP Inductive module probe  
OMP Optical module probe  
OMM Optical module machine  
OMI Optical machine interface
### LP2 dimensions

#### Probing directions

<table>
<thead>
<tr>
<th>Stylus overtravel</th>
<th>LP2 and LP2 DD specification</th>
<th>LP2H and LP2H DD specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>±X, ±Y, +Z</td>
<td>±12.5° 6.5 mm (0.25 in)</td>
<td>±12.5° 5.0 mm (0.25 in)</td>
</tr>
</tbody>
</table>
| LP2: X and Y direction  
Z direction | ±12.5° 6.5 mm (0.25 in) | |  
| LP2 DD: X and Y direction 
Z direction  
Z when fitted with swarf deflector | ±15° 6.5 mm (0.25 in)  
4.5 mm (0.18 in) | ±15° 5.0 mm (0.20 in)  
4.5 mm (0.18 in) |

#### Uni-directional repeatability with 35 mm (1.37 in) stylus

1.0 μm (0.00004 in) valid for test velocity of 480 mm/min (1.5 ft/min) at stylus tip  
2.0 μm (0.00008 in) valid for test velocity of 480 mm/min (1.5 ft/min) at stylus tip

#### Trigger force adjustable

- XY plane - lowest force
- XY plane - highest force
- +Z direction

- **LP2**
  - Adjustable - factory setting given
  - 0.5 N (50 gf) 1.76 ozf
  - 0.9 N (90 gf) 3.17 ozf
  - 5.85 N (585 gf) 20.6 ozf
- **LP2 DD**
  - NOT adjustable
  - 2.0 N (200 gf) 7.05 ozf
  - 4.0 N (400 gf) 14.10 ozf
  - 30 N (3.0 kgf) 6.6 lbf

#### Weight

- 65g (2.3 oz)

#### Stylus length

- Standard: 50 mm (1.97 in)
- Longest: 100 mm (3.94 in)
- Longest: 150 mm (5.91 in)

#### Mounting

- M16 thread, for LT extension bars and adaptors

#### Interface for transmission system

- Hard wired MI 5 or MI 8 or MI 8-4
- Inductive MI 5
- MI 12 + OMM or OMI
- Hard wired MI 5 or MI 8 or MI 8-4
- Inductive MI 5
- Optical MI 12 + OMM or OMI

### Probe sealing

#### LP2

- Metal eyelid seal
- Diaphragm
- O ring

#### LP2 DD

- Metal eyelid seal
- Diaphragm

#### LP2H

- Metal eyelid seal
- Diaphragm

#### LP2HD

- Swarf deflector (optional)
- Diaphragm
### Parts List

**Parts list – please quote the part number when ordering equipment**

<table>
<thead>
<tr>
<th>Type</th>
<th>Part no.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LP2</td>
<td>A-2063-6098</td>
<td>LP2 probe supplied with two C spanners and TK1 tool kit.</td>
</tr>
<tr>
<td>LP2H</td>
<td>A-2064-0002</td>
<td>LP2H probe supplied with two C spanners and TK1 tool kit.</td>
</tr>
<tr>
<td>LP2 DD</td>
<td>A-2063-8020</td>
<td>LP2 DD probe supplied with two C spanners and TK1 tool kit.</td>
</tr>
<tr>
<td>LP2H DD</td>
<td>A-2064-0032</td>
<td>LP2H DD probe supplied with two C spanners and TK1 tool kit.</td>
</tr>
<tr>
<td>TK1</td>
<td>A-2053-7531</td>
<td>Probe tool kit comprising: Ø1.98 mm stylus tool, 1.5 mm AF hexagon key, 2.0 mm AF hexagon key, 2.5 mm AF hexagon key, 3.0 mm AF hexagon key and 4.0 mm AF hexagon key.</td>
</tr>
<tr>
<td>C spanner</td>
<td>A-2063-7587</td>
<td>C spanner: One required for fitting probe to machine. Two required to connect probe to extension bar or removing front cap for cleaning.</td>
</tr>
<tr>
<td>DK2 kit</td>
<td>A-2063-7542</td>
<td>Service kit for LP2 and LP2H comprising: Front cap, metal eyelid, spring and rear O ring.</td>
</tr>
<tr>
<td>DDCK kit</td>
<td>A-2063-8023</td>
<td>Diaphragm conversion kit: Converts LP2 to LP2DD or LP2H to LP2H DD comprising: Two C spanners, front ring, outer diaphragm and rear O ring.</td>
</tr>
<tr>
<td>DDRK kit</td>
<td>A-2063-8030</td>
<td>Diaphragm replacement kit for LP2 DD and LP2H DD comprising: Outer diaphragm and rear O ring.</td>
</tr>
<tr>
<td>SA8</td>
<td>M-5000-7582</td>
<td>Stylus adaptor with break protection.</td>
</tr>
<tr>
<td>SD1</td>
<td>M-2063-8003</td>
<td>Swarf deflector.</td>
</tr>
</tbody>
</table>

**Publications.** These can be downloaded from our web site at www.renishaw.com

- **Styli**
  - H-1000-3200: Brochure. Styli and accessories
- **Adaptors/extensions holders/socket**
- **Probe holder**
- **Hard wired transmission**
- **Inductive transmission**
- **MI 5 interface**
- **MI 8 interface**
- **MI 8-4 interface**
- **Optical transmission**
- **Optical transmission**
- **OMM**
- **OMI**
- **MI 12 interface**
- **Software**
- **LP2 RK**
- **DK2**

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