

MH8 user's guide

<http://www.renishaw.com>

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General information

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WEEE



The use of this symbol on Renishaw products and/or accompanying documentation indicates that the product should not be mixed with the 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 save valuable resources and prevent potential negative effects on the environment. For more information, please contact your local waste disposal service or Renishaw distributor.

Warranty

Renishaw plc warrants its equipment for a limited period (as set out in our Standard Terms and Conditions of Sale) provided that it is installed exactly as defined in associated Renishaw documentation.

Prior consent must be obtained from Renishaw if non-Renishaw equipment (e.g. interfaces and/or cabling) is to be used or substituted. Failure to comply with this will invalidate the Renishaw warranty.

Claims under warranty must be made from authorised service centres only, which may be advised by the supplier or distributor.

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Care of equipment

Renishaw probes and associated systems are precision tools used for obtaining precise measurements and must therefore be treated with care.

Changes to Renishaw products

Renishaw reserves the right to improve, change or modify its hardware or software without incurring any obligations to make changes to Renishaw equipment previously sold.

Packaging

To aid end user recycling and disposal the materials used in the different components of the packaging are stated here:

Packaging component	Material	94/62/EC code	94/62/EC number
Outer box	Corrugated fibreboard	PAP	20
Packaging insert	Corrugated fibreboard	PAP	20
Bag	Low density Polyethylene	LDPE	4

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Product compliance

EU declaration of conformity

Contact Renishaw plc or visit www.renishaw.com/EU for the full EU declaration.

REACH regulation

Information required by Article 33(1) of Regulation (EC) No. 1907/2006 ("REACH") relating to products containing substances of very high concern (SVHCs) is available at:

www.renishaw.com/REACH

China RoHS

Contact Renishaw plc or visit www.renishaw.com/ChinaRoHS for the full China RoHS tabulation.



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Introduction

The MH8 is a manually operated, indexing probe head that articulates to provide orientation of the stylus. The head can carry probes fitted with a Renishaw M8 connector. The TP20 and TP6 touch-trigger probes are recommended. The MH8 is available with a range of shanks to suit the mounting arrangement specified by the manufacturer of the CMM.

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Product description

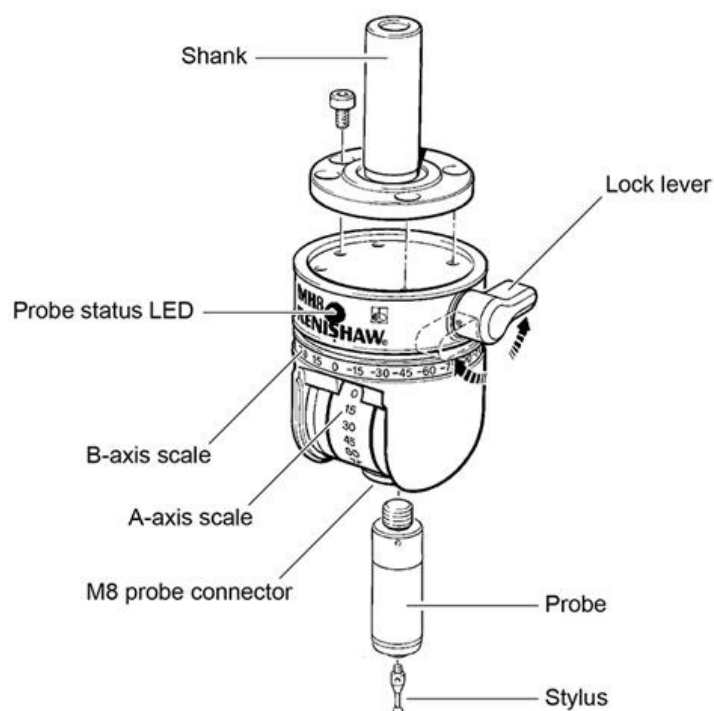
The MH8 has 2 axes. The probe connector is carried on the A-axis which can rotate the probe through 90° in the Z plane. The B-axis can rotate the probe through $\pm 180^\circ$ in the X-Y plane.

A lever actuated mechanism locks both axes in the desired position for gauging the workpiece. The axes are unlocked to allow free rotation to another position. The locked positions are set at angular increments of 15° in each axis, providing a total of 168 positions.

When the head orientation is locked, the probe is kinematically constrained in a highly repeatable spatial position. This means that after initial qualification of the stylus tip, in the positions required for gauging the workpiece, the probe may be reorientated to any of the qualified positions without the need for requalification.

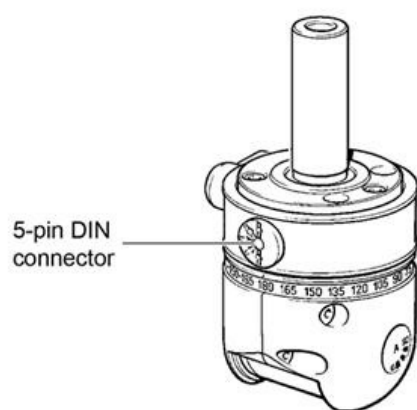
A red LED is provided on the front of the head to indicate the probe's status. The LED may be driven by the CMM controller or by a Renishaw probe interface. It is convention for the LED to be ON to indicate a seated (armed) probe and to be OFF to indicate a triggered probe.

Electrical connection is via a 5 pin DIN connector.



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Part number summary

Part number	Description
A-1332-0013	MH8 probe head
A-1332-0002	MH8 probe head + TK4 probe tools (no shank)
A-1332-0003	MH8 + TK4 + MS1 shank
A-1332-0004	MH8 + TK4 + MS2 shank
A-1332-0005	MH8 + TK4 + MS4 shank
A-1332-0006	MH8 + TK4 + MS5 shank
A-1332-0007	MH8 + TK4 + MS7 shank
A-1332-0008	MH8 + TK4 + MS9 shank
A-1332-0009	MH8 + TK4 + MS10 shank
A-1332-0010	MH8 + TK4 + MS13 shank
A-1332-0011	MH8 + TK4 + MS15 shank
A-1332-0014	MH8 + TK4 + MS17 shank
A-1332-0012	MH8 + TK4 + D shank
A-1042-1486	S1 'C' spanner
A-1047-3932	S9 double ended 'C' spanner
M-5000-3540	S7 stylus tightening tool
P-TL03-0150	Hexagon key, 1.5 mm AF (TP2 / TP6 adjustment)

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Installation procedure

Mounting the shank on the probe head

- Hold the shank in the recess on the top face of the MH8
- Rotate the shank until the three screw holes are aligned
- Fix the shank in place using only the M3 × 5 mm screws (supplied)
- Progressively tighten using the 2.5 mm A/F hexagon key (supplied)

Mounting the head on the CMM

The head will normally be attached to the quill of the CMM using a standard shank, specified by the CMM manufacturer.

Standard shanks are listed in the 'Part number summary'.

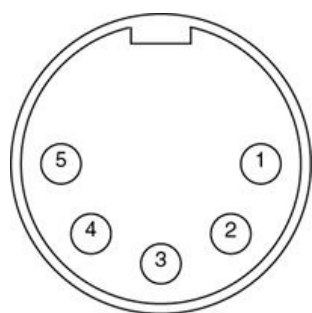
Special or customised mounting arrangements are possible. Please contact your supplier or Renishaw, for details of our custom products service.

The mounting must be absolutely rigid, as any movement during normal operation of the head will add errors to the measurement system.

If the head is replaced or repositioned in the quill, it will be necessary to requalify all of the head positions in current use.

Electrical connection

Connection is by means of a 5-pin DIN connector on the side of the head.



The pin numbering functions are given in the table below:

Pin number	Designation
1	LED cathode
2	Ground
3	LED anode
4	Probe circuit
5	Probe circuit

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Mounting the probe to the probe head

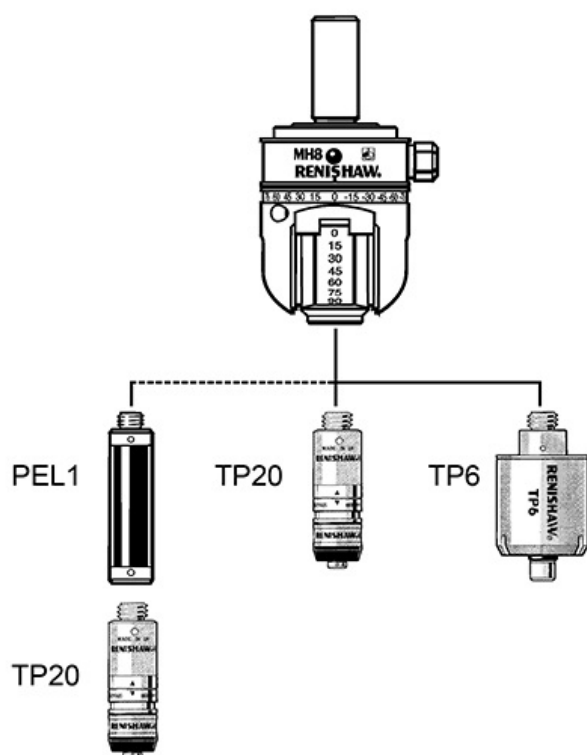
If fitting a TP20 probe, mount the probe body to the probe head before fitting the probe module and stylus.

- Screw the threaded end of the probe into the M8 connector on the probe head until it is finger tight
- Fit the S1 'C' spanner (supplied) to the location holes in the probe body and tighten by hand
- The recommended tightening torque is 0.3 Nm - 0.5 Nm

Refer also to the user's guide for the probe type being used.

Extension bars

Probe reach may be extended by 50 mm using a PEL1 extension bar. Use of the PEL2, PEL3 or PE series extension bars is not recommended.



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Head operation

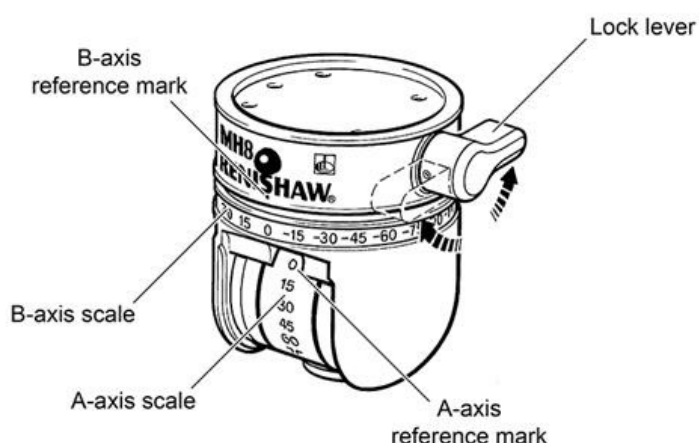
NOTE: Ensure that the lock lever is turned fully clockwise to the locked position, before taking gauge points.

To change the orientation of the probe

- Unlock the head by turning the lock lever to the fully anti-clockwise position
- Grip the body of the probe (avoid touching the stylus) and rotate the B-axis until the desired angle indication on the scale (in increments of 15°) is adjacent to the B-axis reference mark
- Rotate the A-axis until the desired angle indication on the scale (in increments of 15°) is at the A-axis reference position
- Lock the head by turning the lock lever to the fully clockwise position
- Qualify the stylus tip(s) according to the CMM supplier's instructions
- Change the orientation of the probe to the next desired position and qualify the stylus tip(s)
- Repeat the qualification process for all desired orientations and stylus tips
- Commence gauging, ensuring that the correct qualification data is recalled for each head position

Periodic requalification should be performed according to the following considerations:

- CMM supplier's recommendations, particularly in respect of temperature changes
- At the start of the working day or shift
- After an accidental collision
- After changing any measuring system component (except a prequalified TP20 module)
- If the initial state is unknown or uncertain



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Technical specification

Measuring performance

Positional repeatability (2σ) (At stylus tip with TP20 probe, standard force module and 10 mm stylus length)	1.5 μ m
Positional repeatability (2σ) with 50 mm extension bar (PEL1) (At stylus tip with TP20 probe, standard force module and 10 mm stylus length)	2.5 μ m

Technical data

Range of articulation	A-axis: 0° to 90° in 15° increments B-axis: \pm 180° in 15° increments
Maximum load	TP6 - no extension allowed TP20 or TP2 probe + 50 mm extension (PEL1)
Operating temperature range	+10 °C to +40 °C
Storage temperature range	-10 °C to +70 °C
Probe connector	Renishaw M8 \times 1.25 mm \times 5 mm
Electrical connector	5-pin DIN (180°)
Sealing	IP30
Weight	205 g (without shank)

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Maintenance

This product is intended for use in a protected metrology environment and therefore accumulations of dust or swarf should not occur.

In common with all precision measuring equipment, regular inspection and cleaning are recommended to ensure continued high performance.

Maintenance is limited to wiping the outer surfaces, axes scale labels and mounting face of the probe connector with a clean, dry cloth or proprietary cleaning material.

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Fault finding

Refer also to the appropriate user's guide for the probe.

Loss of measuring accuracy

Possible causes	Remedy
Mounting not secure.	Check that the MH8 is correctly mounted to the shank and that the screws are secure. Check the clamping mechanism in the CMM quill.
MH8 not fully locked.	Ensure that the lock lever is turned fully clockwise.
Excessive force imparted to probe after locking.	Unlock and re-lock the MH8.
MH8 overloaded.	Use only with the specified probe and extension combinations.
Faulty probe.	Check by substitution.
MH8 worn or damaged.	Check by substitution or return to Renishaw or your supplier.

Axes 'rattle' when rotated

Possible causes	Remedy
MH8 not fully unlocked.	Turn lock lever fully anticlockwise before attempting to reorientate probe.

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