

MP3 probe with inductive or hard-wired signal transmission system



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Renishaw part no: H-2000-5002-02-A

Issued: 06 03

Installation and user's guide
MP3 inspection probe
with inductive or
hard-wired transmission system



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 must 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.

FCC Section 15.27

The user is also cautioned that any peripheral device installed with this equipment such as a computer, must be connected with a high-quality shielded cable to insure compliance with FCC limits.

GB - WARNINGS

Information for the user

Beware of unexpected movement. The user should remain outside of the full working envelope of probe head/extension/probe combinations.

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

Remove power before performing any maintenance operations.

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 machine movement.

F - AVERTISSEMENTS

Informations à l'attention de l'utilisateur

Attention aux mouvements brusques. L'utilisateur doit toujours rester en dehors de la zone de sécurité des installations multiples tête/rallonge/ palpeur.

Le port de lunettes de protection est recommandé pour toute application sur machine-outil et MMT.

Mettre la machine hors tension avant d'entreprendre toute opération de maintenance.

Consulter le mode d'emploi du fournisseur de la machine.

Informations à l'attention du fournisseur de la machine

Il incombe au fournisseur de la machine d'assurer que l'utilisateur prenne connaissance des dangers d'exploitation, y compris ceux décrits dans la documentation du produit Renishaw, et d'assurer que des protections et verrouillages de sûreté adéquats soient prévus.

Dans certains cas, il est possible que le signal issu du capteur indique à tort que celui-ci est hors matière. Ne pas se fier aux signaux du capteur qui ne garantissent pas toujours l'arrêt de la machine.

D - ACHTUNG

Informationen für den Benutzer

Auf unerwartete Bewegungen achten. Der Anwender sollte sich möglichst nur außerhalb des Messtaster-Arbeitsbereiches aufhalten.

Bei Arbeiten an Werkzeugmaschinen oder Koordinatenmessgeräten wird Augenschutz empfohlen.

Vor Wartungsarbeiten muss die Stromversorgung getrennt werden.

Beziehen Sie sich auf die Wartungsanleitungen des Lieferanten.

Informationen für den Maschinenlieferanten

Es obliegt dem Maschinenlieferanten, den Anwender über alle Gefahren, die sich aus dem Betrieb der Ausrüstung, einschließlich der, die in der Renishaw Produktdokumentation erwähnt sind, zu unterrichten und zu versichern, dass ausreichende Sicherheitsvorrichtungen und Verriegelungen eingebaut sind.

Unter gewissen Umständen könnte das Messtaster Fehlsignale melden (Ausgelenkt). Verlassen sie sich nicht auf das Messtastersignal um die Maschine zu stoppen.

I - SICUREZZA

Informazioni per l'utente

Fare attenzione ai movimenti improvvisi e tenersi fuori dal campo operativo delle combinazioni testa/prolunga e barra/sonda. Si raccomanda all'utente di tenersi al di fuori dello spazio operativo della testa della sonda, delle prolunghe e di altri accessori della sonda.

Si raccomanda di indossare occhiali di protezione in applicazioni che comportano l'utilizzo di macchine utensili e macchine per misurare a coordinate.

Prima di effettuare qualsiasi intervento di manutenzione, isolare la rete di alimentazione.

Consultare le istruzioni d'uso del fabbricante della macchina.

Informazioni per il fabbricante della macchina

Il fornitore della macchina ha la responsabilità di avvertire l'utente dei pericoli inerenti al funzionamento della stessa, compresi quelli riportati nelle istruzioni della Renishaw, e di mettere a disposizione i ripari di sicurezza e gli interruttori di esclusione.

Una installazione e un utilizzo non corretti e/o una manutenzione inadeguata potrebbero alterare gli output della sonda, producendo informazioni inesatte sullo stato "in posizione" della sonda stessa.

E - ADVERTENCIAS

Información para el usuario

Tener cuidado con los movimientos inesperados. El usuario debe quedarse fuera del grupo operativo completo compuesto por la cabeza de sonda/extensión/sonda o cualquier combinación de las mismas.

Se recomienda usar protección para los ojos en todas las aplicaciones que implican el uso de máquinas herramientas y máquinas de medición de coordenadas.

Quitar la corriente antes de emprender cualquier operación de mantenimiento.

Remitirse a las instrucciones de manejo del proveedor de la máquina.

Información para el proveedor de la máquina

Corresponde al proveedor de la máquina asegurar que el usuario esté consciente de cualquier peligro que implica el manejo de la máquina, incluyendo los que se mencionan en la documentación sobre los productos Renishaw y le corresponde también asegurarse de proporcionar dispositivos de protección y dispositivos de bloqueo de seguridad adecuados.

Bajo determinadas circunstancias la señal de la sonda puede indicar erróneamente que la sonda está asentada. No fiarse de las señales de la sonda para parar el movimiento de la máquina.

P - AVISOS

Informações para o Utilizador

Tome cuidado com movimentos inesperados. O usuário deve permanecer fora da área de trabalho das combinações do cabeçote/extensão/apalpador.

Em todas as aplicações que envolvam a utilização de Máquinas Operatrizes e Tridimensionais, recomenda-se utilizar proteção para os olhos.

Desligar a alimentação de energia antes de efetuar qualquer operação de manutenção.

Consultar as instruções de funcionamento do fabricante da máquina.

Informações para o Fornecedor da Máquina

É responsabilidade do fabricante da máquina assegurar que o usuário esteja consciente de quaisquer perigos envolvidos na operação, incluindo os mencionados na documentação dos produtos Renishaw e assegurar que são fornecidas proteções e bloqueios de segurança adequados.

Em determinadas circunstâncias, o sinal do apalpador pode indicar incorretamente uma condição de toque. Não confie nos sinais do apalpador para parar o movimento da máquina.

DK - ADVARSLER

Oplysninger til brugeren

Pas på uventede bevægelser. Brugeren bør holde sig uden for hele probehovedets/forlængerens/probens arbejdsområde.

I alle tilfælde, hvor der anvendes værktøjs- og koordinatmålemaskiner, anbefales det at bære øjenbeskyttelse.

Afbryd strømforsyningen, før der foretages vedligeholdelse.

Se maskinleverandørens brugervejledning.

Oplysninger til maskinleverandøren

Det er maskinleverandørens ansvar at sikre, at brugeren er bekendt med eventuelle risici i forbindelse med driften, herunder de risici, som er nævnt i Renishaws produktokumentation, og at sikre, at der er tilstrækkelig afskærmning og sikkerhedsblokeringer.

Under visse omstændigheder kan probesignalet ved en fejl angive, at proben står stille. Stol ikke på, at probesignaler stopper maskinens bevægelse.

NL - WAARSCHUWINGEN

Informatie voor de Gebruiker

Oppassen voor onverwachte beweging. De gebruiker dient buiten het werkende signaalveld van de Tasterkop/Extensie/Taster combinaties te blijven.

Het dragen van oogbescherming wordt tijdens gebruik van Bewerkingsmachines en CMM's aanbevolen.

Voordat u enig onderhoud verricht dient u de stroom uit te schakelen.

Raadpleeg de bedieningsinstructies van de machineleverancier.

Informatie voor de Machineleverancier

De leverancier van de machine is ervoor verantwoordelijk dat de gebruiker op de hoogte wordt gesteld van de risico's die verbonden zijn aan bediening, waaronder de risico's die vermeld worden in de produktendocumentatie van Renishaw. De leverancier dient er tevens voor te zorgen dat de machine is voorzien van voldoende beveiligingen en veiligheidsrendelinrichtingen.

Onder bepaalde omstandigheden kan het tastersignaal een onjuiste tastertoestand aangeven. Vertrouw niet op de tastersignalen voor het stoppen van de machinebeweging.

FIN - TURVALLISUUS

Käyttäjälle tarkoitettuja tietoja

Varo äkillistä liikettä. Käyttäjien tulee pysyä luotaimen pään ja luotaimen toimintasäteen ulkopuolella.

Kaikkia työstökoneita ja koordinoituja mittauskoneita (CMM) käytettäessä suositamme silmäsuojuksia.

Kytke pois sähköverkosta ennen huoltotoimenpiteitä.

Katso koneen toimittajalle tarkoitettuja käyttöohjeita.

Tietoja koneen toimittajalle

Koneen toimittaja on velvollinen selittämään käyttäjälle mahdolliset käyttöön liittyvät vaarat, mukaan lukien Renishaw'n tuoteselosteessa mainitut vaarat. Toimittajan tulee myös varmistaa, että toimitus sisältää riittävän määrän suoja ja lukkoja.

Tietyissä olosuhteissa anturimerkki saattaa osoittaa virheellisesti, että kyseessä on anturiin liittyvä ongelma. Älä luota anturimerkkeihin koneen liikkeen pysäyttämiseksi.

SW - VARNING

Information för användaren

Se upp för plötsliga rörelser. Användaren bör befinna sig utanför arbetsområdet för sondhuvudet/förlängningen/ sond-kombinationerna.

Ögonskydd rekommenderas för alla tillämpningar som involverar bruket av maskinverktyg och CMM.

Koppla bort strömmen innan underhåll utförs.

Se maskintillverkarens bruksanvisning.

Information för maskinleverantören

Maskinleverantören ansvarar för att användaren informeras om de risker som drift innebär, inklusive de som nämns i Renishaws produktdokumentation, samt att tillräckligt goda skydd och säkerhetsföreglingar tillhandahålls.

Under vissa omständigheter kan sondens signal falskt ange att en sond är monterad. Lita ej på sondersignaler för att stoppa maskinens rörelse.

GR - ΠΡΟΕΙΔΟΠΟΙΗΣΕΙΣ

Πληροφορίες για τους χρήστες

Προσοχή - κίνδυνος απροσδόκητων κινήσεων. Οι χρήστες πρέπει να παραμένουν εκτός του χώρου που επηρεάζεται από όλους τους συνδυασμούς λειτουργίας της κεφαλής του ανιχνευτή, της προέκτασης και του ανιχνευτή.

Σε όλες τις εφαρμογές που συνεπάγονται τη χρήση εργαλείων μηχανημάτων και εξαρτημάτων CMM, συνιστάται η χρήση συσκευής προστασίας των ματιών.

Αποσυνδέστε το μηχάνημα από το ηλεκτρικό ρεύμα προτού επιχειρήσετε τυχόν εργασίες συντήρησης.

Βλέπετε τις οδηγίες λειτουργίας του προμηθευτή του μηχανήματος.

Πληροφορίες για τους προμηθευτές των μηχανημάτων

Αποτελεί ευθύνη του προμηθευτή του μηχανήματος να εξασφαλίσει ότι ο χρήστης είναι ενήμερος τυχόν κινδύνων που συνεπάγεται η λειτουργία, συμπεριλαμβανομένων και όσων αναφέρονται στο διαφωτιστικό υλικό του προϊόντος της Renishaw. Είναι επίσης ευθύνη του να εξασφαλίσει ότι υπάρχουν τα απαιτούμενα προστατευτικά καλύμματα και συνδέσεις ασφαλείας.

Υπό ορισμένες συνθήκες μπορεί το σήμα ανιχνευτή να δώσει εσφαλμένη ένδειξη θέσης του ανιχνευτή. Μη βασίζεστε στα σήματα ανιχνευτή για θέση της κίνησης του μηχανήματος εκτός λειτουργίας.

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 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

Treat the probe as a precision instrument.

IP rating IPX8.

Environment

Temperature

The MP3 probe is specified for storage over -10 °C to 70 °C (14 °F to 158 °F) and operation over 0 °C to 60 °C (32 °F to 140 °F) ambient temperature range.

Patent notice

US 4,636,960.

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Typical probe system - inductive transmission

Machining centre job set-up and inspection

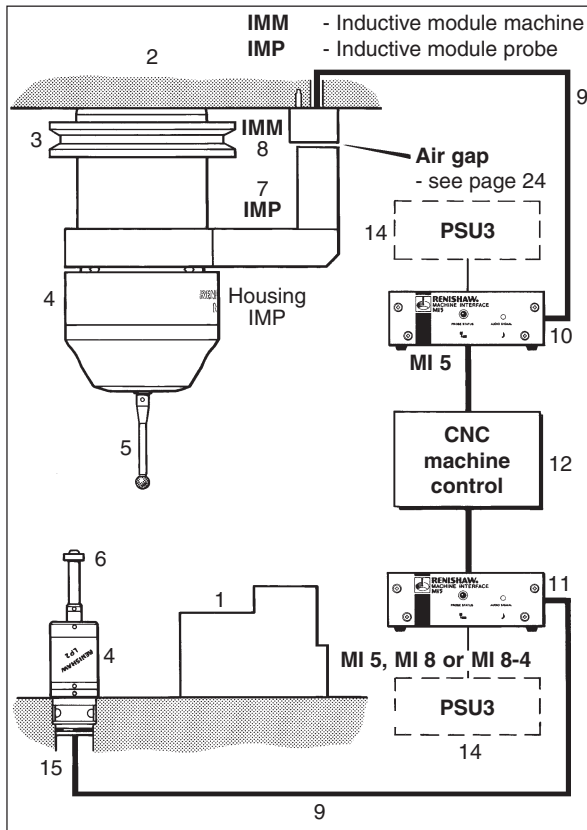
Inductive signal transmission

1. Workpiece.
2. Machine spindle.
3. Shank.
4. MP3 probe.
5. Stylus.
7. Housing /inductive module probe (IMP).
8. Inductive module machine (IMM).
9. Cable.
10. MI 5 interface unit.
12. CNC machine control.
14. PSU3 power supply unit (optional).

Tool setting

Hard-wired signal transmission

4. LP2 probe.
6. Square tip stylus.
9. Cable.
11. MI 5, MI 8 or MI 8-4 interface.
12. CNC machine control.
14. PSU3 power supply unit (optional).
15. Socket for LP2.

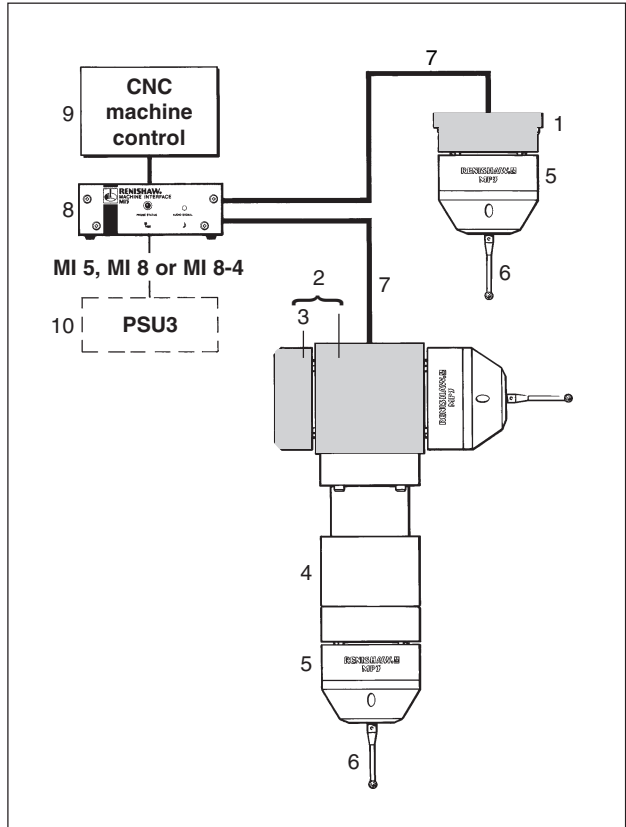


Typical probe system - hard-wired transmission

Machining centre job set-up and inspection

Hard-wired signal transmission

1. 1-way mounting block.
2. 3-way mounting block.
3. Cover.
4. MEH3 extension housing.
5. MP3 probe.
6. Stylus.
7. Cable.
8. Interface unit MI 5, MI 8 or MI 8-4.
9. CNC machine control.
10. PSU3 power supply unit (optional).



MP3 probe specification

Repeatability

A rigid probe mounting is essential for good repeatability.

Max 2 sigma (2σ) value

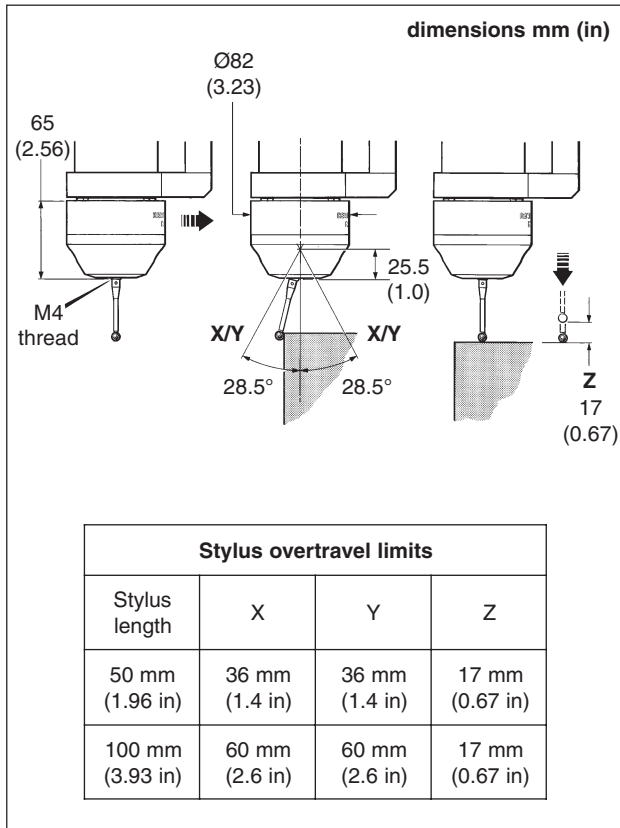
Repeatability of $1.0\ \mu\text{m}$ ($40\ \mu\text{in}$) is valid for test velocity of 480 mm/min (1.57 ft/min) at the stylus tip using a stylus 50 mm (1.97 in) long.

Stylus trigger force

Set at factory using a stylus 50 mm (1.97 in) long. X and Y trigger forces vary around the stylus seating.

X-Y direction 0.75 N -1.5 N
 75 gf -150 gf
 (2.6 ozf - 5.29 ozf)

Z direction 4.9 N
 490 gf
 (17.28 ozf)



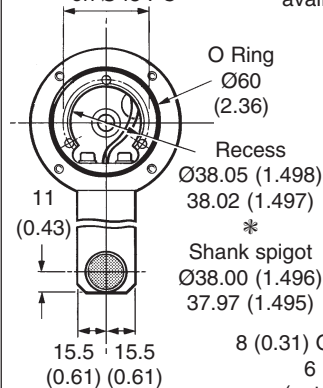
Housing/IMP

Renishaw provides a comprehensive range of housing/IMPs and IMMs. The range is listed in data sheet ITS part no. H-2000-2140.

Dimension **R** is available in increments of 5 mm, from 55 mm to 115 mm (2.16 in to 4.52 in).

Dimension **L** is available in increments of 5 mm, from 5 mm to 60 mm (0.19 in to 2.36 in).

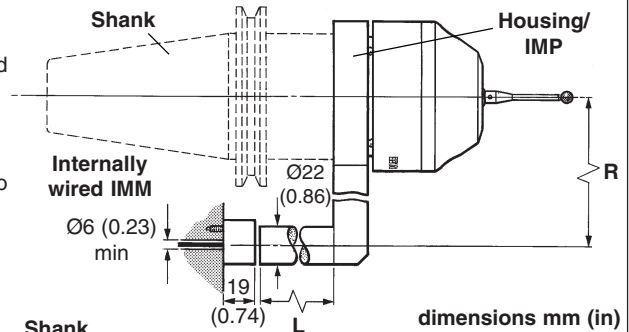
Three screws (supplied)
M4 x 0.7 - 35 mm long
on Ø45 PC



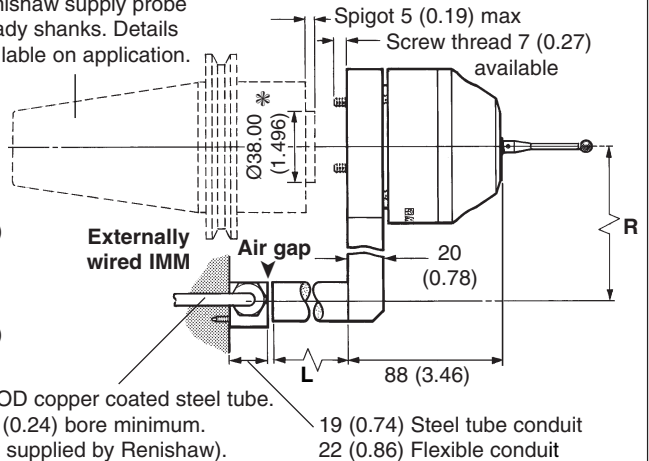
Renishaw supply probe ready shanks. Details available on application.

8 (0.31) OD copper coated steel tube.
6 (0.24) bore minimum.

Shank



dimensions mm (in)



Stylus spring pressure adjustment - gauging force

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

Spring pressure is set by Renishaw. The user should only adjust spring pressure in special circumstances, e.g. excessive machine vibration or insufficient pressure to support the stylus weight.

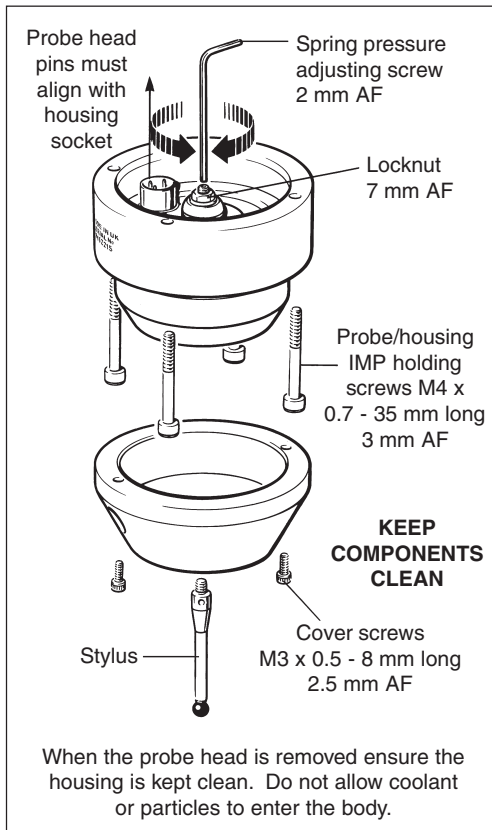
The probe head detaches to provide access to the spring pressure adjusting screw.

First release the locknut, then turn the adjusting screw either anti-clockwise to reduce pressure for greater sensitivity or clockwise to increase pressure.

CAUTION: Overtightening will eventually unseat an internal seal. To check if sealing is secure, press the stylus inwards. On release the probe outer diaphragm should return to its original shape, any crumpling indicates that the internal seal is no longer effective.

Turn the adjusting screw anti-clockwise to reseal the internal seal. Oil leakage around the adjusting screw will also indicate over tightening. Finally tighten the locknut to 1 Nm (0.74 lbf.ft).

Stylus spring pressure adjustment and use of styli, other than calibration stylus type, may cause repeatability to differ from the test certificate results.



Stylus on-centre adjustment

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

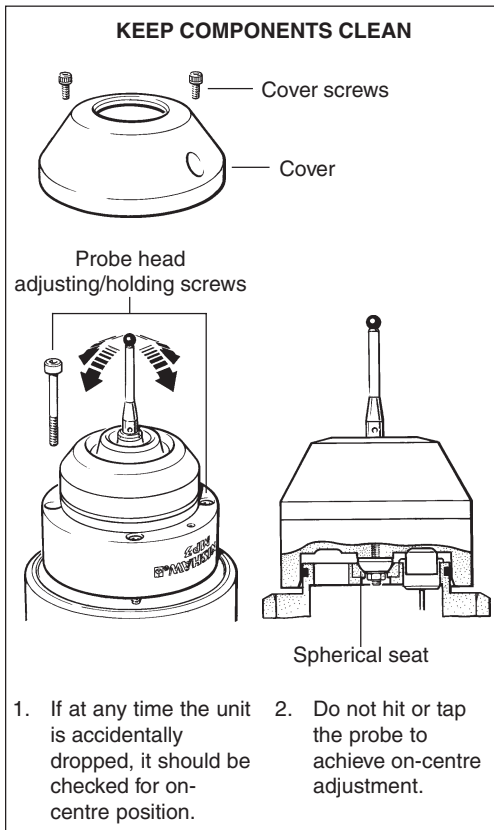
1. Alignment must be as exact as possible, when probe vector software is used.
2. The probe must be parallel to the spindle axis to prevent stylus stem contact when gauging deep holes.
3. When the machine control software cannot compensate for an offset stylus.

How to check the stylus position

Stylus tip and stem position are established using a low force (less than 0.2 N / 0.045 lbf.) dial test indicator or setting gauge. Alternatively rotate the stylus ball against a flat surface. Alignment is good when the stylus ball maintains a consistent distance from the flat surface.

Stylus alignment

First remove the two probe front cover screws, and remove the front cover. This provides access to four probe head holding screws. To adjust stylus alignment, slacken the probe head holding screws to allow the probe head to pivot on its spherical seat. Adjust and tighten these four screws to lock the probe head in its new position. Then check the new position for alignment. When the stylus is correctly aligned, check the tightness of the holding screws, and replace the front cover.



Probe moves

Probe trigger

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

High probing speeds are desirable. However a probing velocity must be chosen which allows the machine to stop within the limits of stylus overtravel and machine measuring capability. Follow the feed rate guidelines given by supplier.

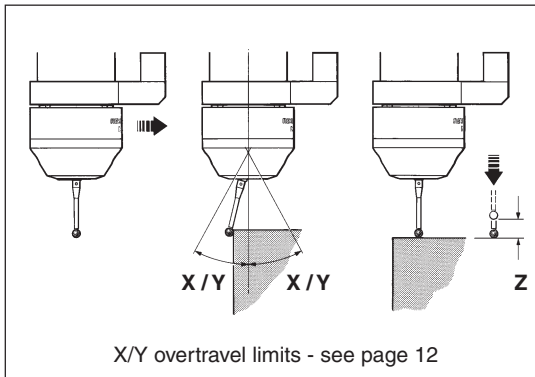
To ensure a trigger signal is given, drive the probe against the workpiece to a target beyond the expected surface, but within the limits of stylus overtravel.

After the probe stylus touches the surface, reverse clear of the surface.

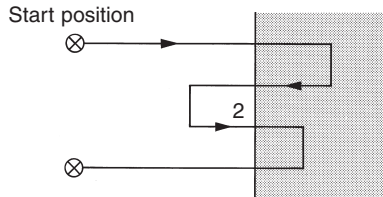
Single and double touch

With some types of controllers, it is an advantage to use a two touch method as poor repeatability can result at higher feed rates.

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



With a double touch sequence the first move finds the surface quickly. Then the probe is reversed to a position clear of the surface, before making the second touch at a slower feed rate, thereby recording the surface position at a higher resolution.



Probe moves

System delays

System delays are repeatable to less than 2 μ s, and are constant in each direction measurement is taken.

Delays are automatically compensated, provided a calibration move is made in the same direction and velocity as each measurement move.

Calibrating a system

In the following circumstances, calibrate the probe system at a constant measurement speed and in the measurement direction to automatically compensate for errors:

1. Before the system is used.
2. When a new stylus is used.
3. If the stylus is bent.
4. To allow for machine thermal growth.
5. Poor shank relocation repeatability in the machine spindle.

Probe cycles and features are machine software dependant.

Software for probing routines is available from Renishaw

Software requirements

Software for turning and machining centres

Good software will allow the following functions :

- Simple to use calibration routines
- Update a tool offset.
- Generate an alarm if a broken tool is found or set a flag for corrective action.
- Update work co-ordinate systems for positioning.
- Report measured sizes and update tool offsets for automatic tool offset compensations.
- Print data in the form of an inspection report to an external PC / printer.
- Set tolerances on features.

Verify your software

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

NOTE: Machining centre applications

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

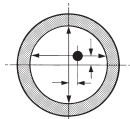
- 2 Does your software compensate for probe triggering characteristics in all measuring directions.
- 3 Does the software automatically adjust the program co-ordinate system to the relevant set-up feature on the component, for job set-up purposes.

Software for machining centres

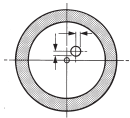
Simple to use canned cycles for basic features

Calibration

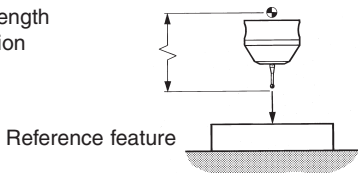
Probe XY offset calibration



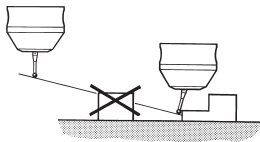
Stylus ball radius calibration



Probe length calibration



Probe collision protection

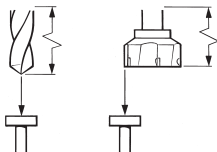


Tool setting probe

Length setting (rotating and non rotating).

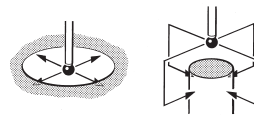
Diameter setting (rotating).

Broken tool detection.

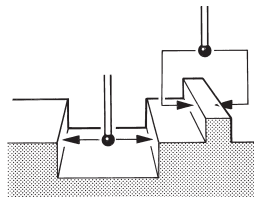


Inspection

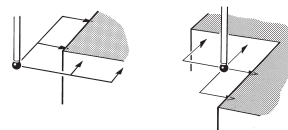
Bore and boss measure



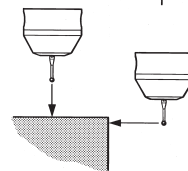
Web and pocket measure



Internal and external corner find



XYZ single surface position



Inspection print-out

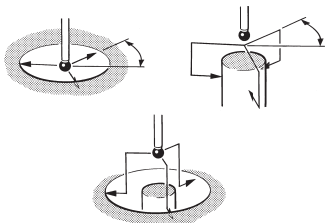
COMPONENT No. 1				
OFFSET NO.	NOMINAL DIMENSION	TOLERANCE	DEVIATION FROM NOMINAL	COMMENTS
99	1.5000	.1000	.0105	
97	200.0000	.1000	.2054	OUT OF TOL

Software for machining centres

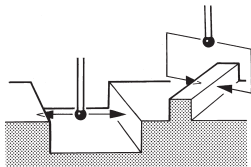
Simple to use canned cycles for additional features

Inspection

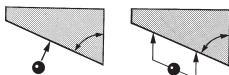
Bore and boss (three point)



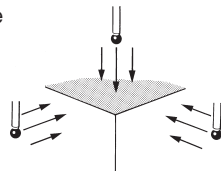
Web and pocket angled measure



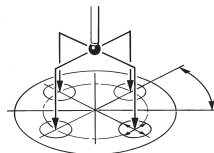
Angled surface measure



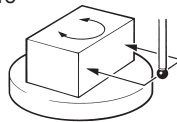
Stock allowance



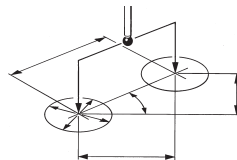
Bore and boss on PCD



4th axis measure



Feature to feature measure



Maintenance

The probe is a precision tool so handle with care.

Ensure the probe is firmly secured in its mounting.

Safety: Switch power off when working with electrical components.

Although Renishaw probes require little maintenance, the performance of the probe will be adversely affected if dirt, chips or liquids are allowed to enter the sealed working parts.

Therefore keep all components clean and free from grease and oil. Periodically check cables for signs of damage, corrosion or loose connections.

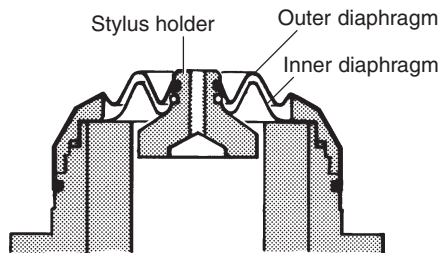
Outer diaphragm inspection

The probe mechanism is protected by two diaphragms, which provide adequate protection under normal working conditions. The user should periodically check the outer diaphragm, for signs of damage and coolant leakage. If this is evident replace the outer diaphragm.

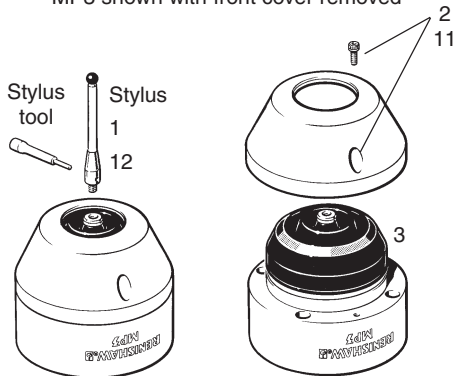
The outer diaphragm is resistant to coolant and oils. However if the outer diaphragm is damaged, the inner diaphragm could become weakened with prolonged immersion in certain coolants and oils.

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

WARNING: Never attempt to remove the outer diaphragm with metal objects.



MP3 shown with front cover removed



Diaphragm inspection

1. Remove the stylus.
2. Remove the front cover.
3. Inspect the outer diaphragm for damage.
4. To remove the outer diaphragm, grip near the middle and pull upwards.

Inner diaphragm inspection

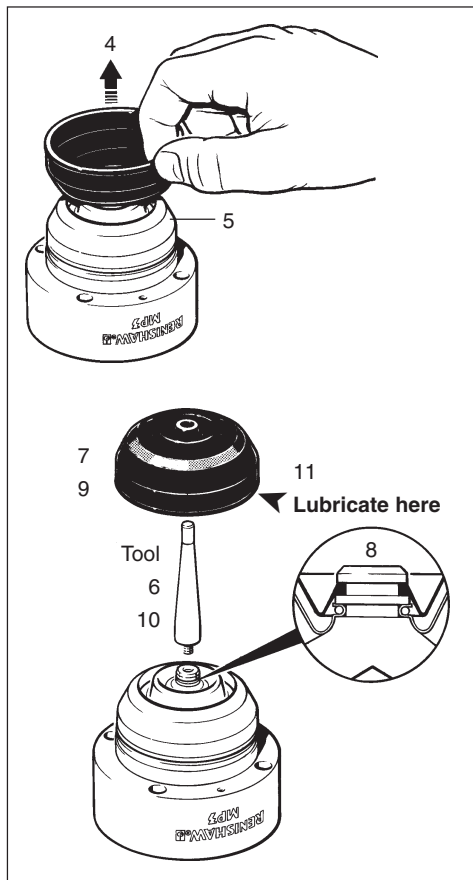
5. Inspect the inner diaphragm for damage.

If damaged return the probe to your supplier for repair.

DO NOT REMOVE THE INNER DIAPHRAGM

Outer diaphragm replacement

6. Screw the tool fully into the stylus holder.
7. Fit the new diaphragm.
8. The diaphragm must locate centrally in the stylus holder groove.
9. Press the diaphragm to expel trapped air.
10. Remove the tool.
11. Lightly lubricate the diaphragm rim surface. Then refit front cover.
12. Refit the stylus.



Fault finding

Complete failure	
Transmission modules not correctly aligned.	Align correctly.
Transmission modules damaged.	Return to supplier for repair. To check IMM, place metal disc against IMM. The audible indicator should bleep when disc is removed. If it does not bleep, replace IMM.
Swarf blocking inductive transmission air gap.	Clean out.
Loose mounting.	Check all bolted or screwed connections for tightness.
Interface LED does not light up.	Check fuses.
Poor electrical connection.	Check connectors.
Cable screen broken.	Replace cable.
Incorrect voltage.	Check supply.
Probe failure.	No continuity through probe circuit.
Probe spring pressure too low.	Tighten stylus spring pressure.
Probe mounting damaged.	Repair or replace.
If these checks do not eliminate the fault, consult your probe supplier.	

Poor repeatability	
Transmission modules not correctly aligned.	Align correctly.
Loose mounting.	Check all bolted and screwed connections for tightness.
Loose stylus.	Tighten.
Poor electrical connections.	Check connectors.
Excessive machine vibration.	Tighten spring pressure.
Spurious reading	
Cable screen broken.	Replace cable.
Poorly regulated supply voltage.	Regulate correctly.
Excessive machine vibration.	Eliminate vibration or adjust stylus spring pressure.
Poor re-arming	
The probe is armed when the stylus mounting is seated, the electrical circuit is complete and the interface LED is lit.	
Spring pressure too low.	Adjust spring pressure.
Inner diaphragm pierced or damaged.	Return to supplier for repair.
If the probe or interface continues to malfunction, return it to your supplier for repair.	

Appendix 1

Inductive signal transmission modules - machining centre

Inductive transmission systems are fully described in data sheet ITS H-2000-2140.

IMP installation is fully described in IMP installation guide H-2000-4037.

IMM installation is fully described in IMM installation guide H-2000-4039.

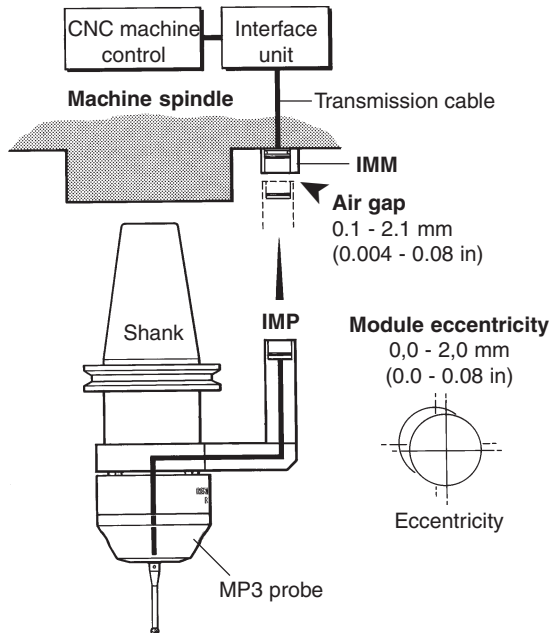
Signal transmission modules

Inductive module probe (IMP)

Inductive module machine (IMM)

Inductive signal transmission modules pass power and signals across an air gap between the IMP and IMM, allowing the probe unit to be easily transferred between the machine spindle and machine tool store, as any other tool in the system.

Modules are always installed in pairs and must locate within specified separation (air gap) and eccentricity limits.



Appendix 2

Adaptors and extensions

Adaptors and extensions are fully described in data sheet AEH H-2000-2120.

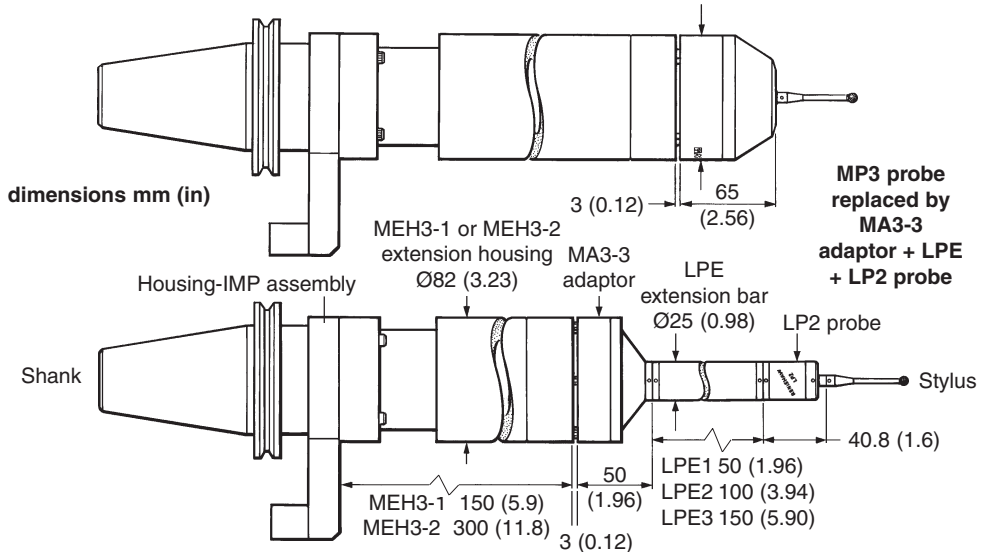
Housing-IMP's are fully described in data sheet ITS H-2000-2140.

Adaptors

Features with restricted access can be probed using an LP2 probe. The MA3-3 adaptor allows the MP3 probe to be substituted with an LP2 probe. The MA3-3 connects directly to the housing/IMP or MEH3 extension.

Extensions

Extensions allow deeper access into workpiece features. MEH extensions are used for machining centre applications. LPE extensions with an M16 thread are suitable for machining centre applications using the LP2 probe.



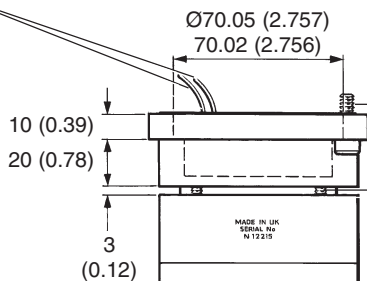
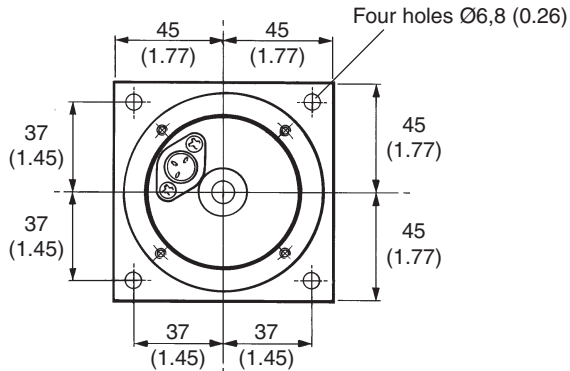
Appendix 3

1-way mounting block for MP3 probe (or LP2 probe with adaptor)

Mounting blocks are typically used on probing systems for vertical turning lathes or other installations requiring hard-wired signal transmission.

Wires

Two separate wires, coloured blue and green. 7/0,2 insulated. Each $\text{Ø}1.2 \times 500 \text{ mm}$ long ($\text{Ø}0.04 \times 19.6 \text{ in}$ long).



Four cap head screws : mounting block to base M6 x 1,0 - 16 long (supplied with mounting block).

Four cap head screws : probe to mounting block M4 x 0,7 - 35 long (supplied with probe).

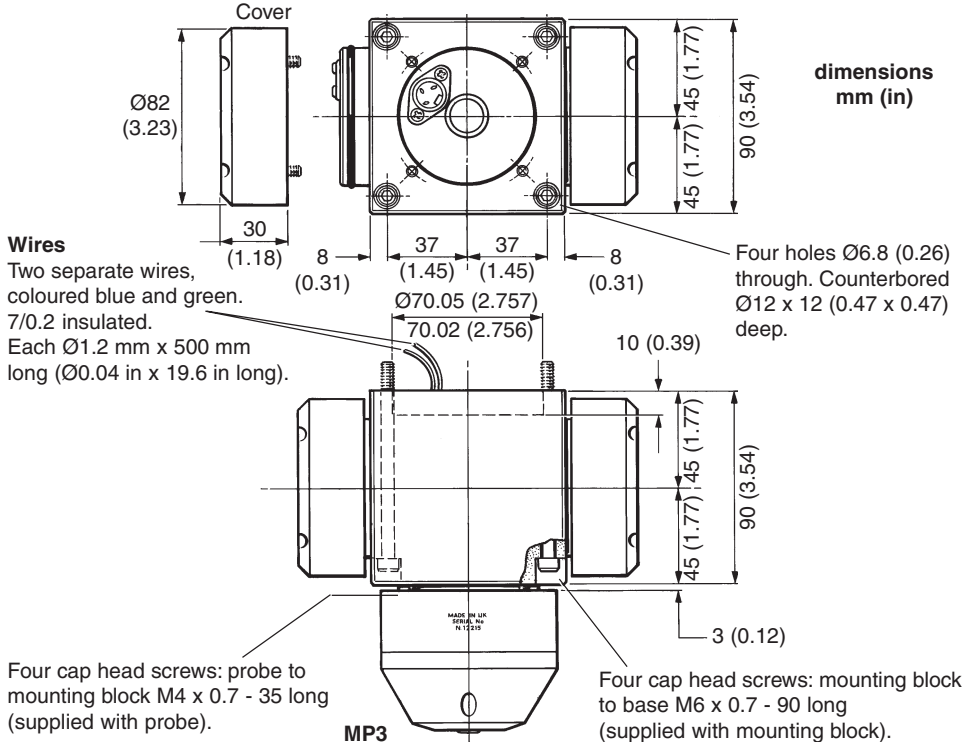
dimensions mm (in)

MP3

APPENDIX 4

3 way mounting block for MP3 probe/s (or LP2 probe with adaptor)

The mounting will accept one to three probes. A probe or cover must be fitted in each mounting position to complete the electrical circuit.



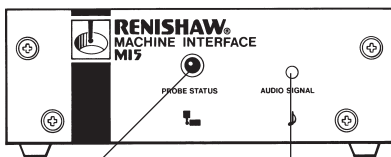
Appendix 5

MI 5 interface unit

The MI 5 is fully described in user's guide H-2000-5014.

The MI 5 interface is used with inductive and/or hard-wired signal transmission systems. System status is presented visually in a continuously updated form, on the front panel diagnostic LED display, and by outputs available from the MI 5 to the CNC control.

Front view



Probe status LED

Lit when the probe is at rest or the interface is inhibited. LED off indicates the probe stylus is deflected or power is off.

Audible indicator

A tone is emitted each time the stylus is deflected or returns to rest.

Interface unit

Interface units convert probe signals into an acceptable form for the CNC machine control.

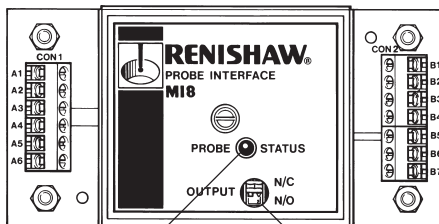
Appendix 6

MI 8 interface unit

The MI 8 is fully described in user's guide H-2000-5015.

The MI 8 interface is used with hard-wired signal transmission systems. System status is presented visually in a continuously updated form on the front panel diagnostic LED display, and by outputs available from the MI 8 to the CNC control.

Front view



Probe status LED

Lit when the probe is at rest or the interface is inhibited.

LED off indicates the probe stylus is deflected or power is off.

Switch SW1

Output N/C
(normally closed)
Output N/O
(normally open)

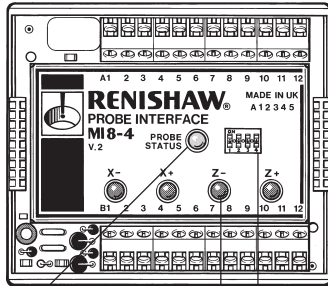
Appendix 7

MI 8-4 INTERFACE UNIT

The MI 8-4 is fully described in user's guide H-2000-5008.

The MI 8-4 is used with hard-wired signal transmission systems. It connects to the machine control input, or it connects into the 4-wire Fanuc 'automatic length measurement' input (XAE, ZAE).

Front view



Bi-colour probe status LED

Green when the probe is at rest or the interface is inhibited.
Red when the probe stylus is deflected.
LED off indicates power is off.

Switch SW1

Output high or output low

Diagnostic LEDs

Indicate direction of machine movement

Appendix 8

PSU3 POWER SUPPLY UNIT

The PSU3 is fully described in user's guide H-2000-5057.

The PSU3 provides a +24 V supply for Renishaw interface units when a power supply is not available from the CNC machine control.

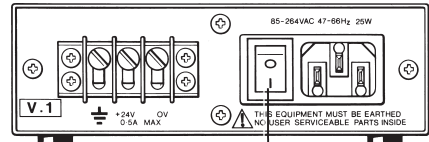
Front view



Power LED

When the green LED is lit, the power supply is on.

Rear view



Mains switch On/Off

Appendix 9

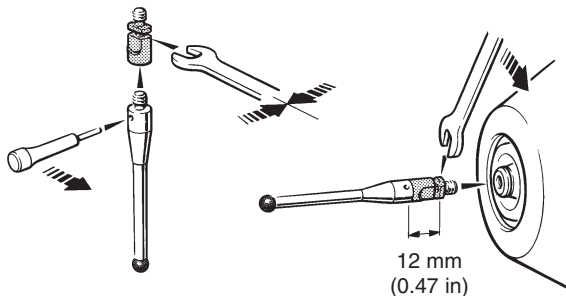
Weak link for styli with steel shaft - optional

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

Fitting the stylus with a weak link onto a typical probe

Take care to avoid stressing the weak link during assembly.
See screw torque value on page 31 (opposite).

Weak link stem

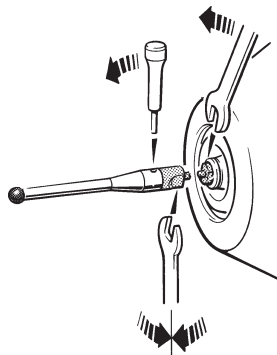


Attach the weak link to the stylus by rotating the tommy bar and holding the spanner steady.

Fit the stylus with weak link to the probe.

NOTE: The weak link is not used with ceramic shaft styli.

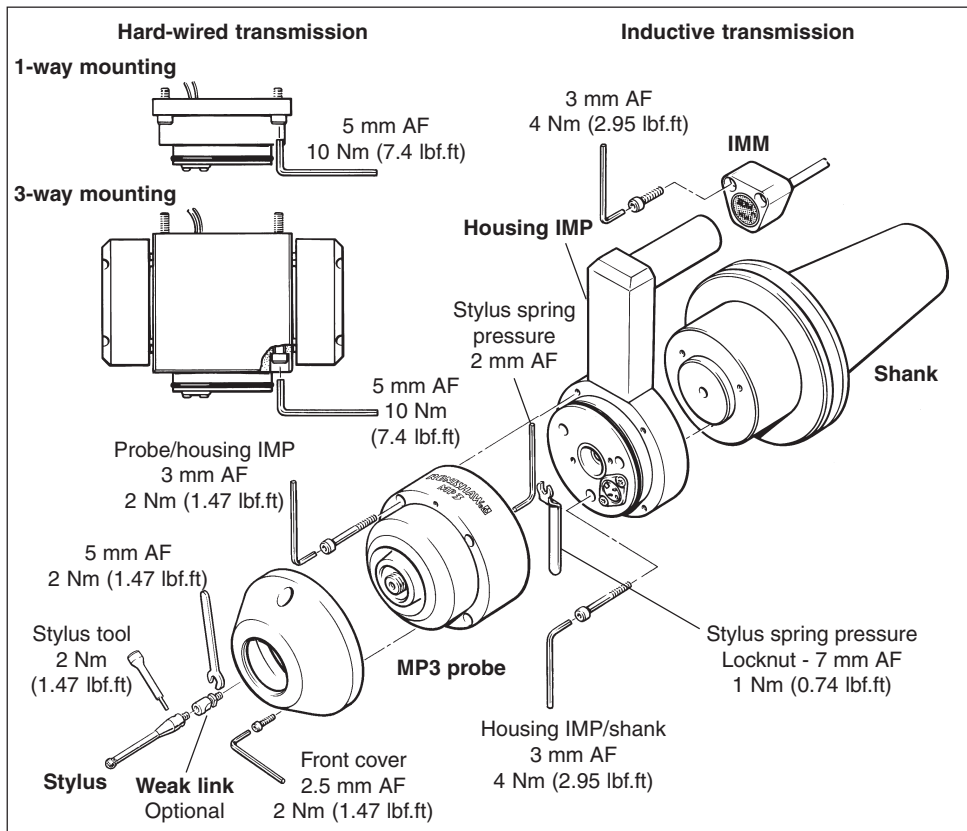
To remove a broken stem



To remove the broken portion of stem from the stylus, use the spanner and tommy bar.

The broken portion of stem attached to the probe is removed with the spanner.

Screw torque values - Nm (lbf.ft)



Parts list - Please quote the part number when ordering equipment

Type	Part number	Description
MP3 probe		
MP3	A-2053-5358	MP3 probe complete with holding screws and TK1 tool kit.
Accessories		
Styli	-	For complete listing see Renishaw styli guide H-1000-3200.
Stylus	A-5000-3709	Ceramic stylus 50 mm long with Ø6 mm ball.
Stylus	A-5000-3712	Ceramic stylus 100 mm long with Ø6 mm ball.
Weak link kit	A-2085-0068	Weak link kit comprising: two stylus weak link stems and spanner.
Weak link	M-2085-0069	Stylus weak link stem.
Spanner	P-TLO9-0003	Spanner for stylus weak link stem.
Screw	P-SCO1-0308	Cap head screw M3 x 0.5 x 8 mm long, for probe cover (2 required).
Screw	P-SCO1-0435	Cap head screw M4 x 0.7 x 35 mm long, probe holding screws (4 required).
TK1 kit	A-2053-7531	TK1 - probe had tool kit comprising: stylus tool, 1.5 mm, 2.0 mm, 2.5 mm, 3.0 mm and 4.0 mm hexagon keys.
DK3 kit	A-2053-8156	DK3 - MP3 outer diaphragm replacement kit.
Shank	-	Renishaw supply probe ready shanks - details available on application.
Mounting block		
Mt block	A-2053-7285	1-way mounting block.
Mt block	A-2053-8275	3-way mounting block complete with two covers.
Cover	A-2053-6488	Cover for 3-way mounting block.
Extensions and adaptor		
MEH3-1	A-2053-7286	MEH3-1 extension housing Ø82 x 150 mm long with holding screws.
MEH3-2	A-2053-7287	MEH3-2 extension housing Ø82 x 300 mm long with holding screws.
MA3-3	A-2063-7583	MA3-3 adaptor - allows LP2 probe to be used in place of MP3 probe.
LPE1	A-2063-7001	LPE1 extension bar Ø25 x 50 mm long.
LPE2	A-2063-7002	LPE2 extension bar Ø25 x 100 mm long.
LPE3	A-2063-7003	LPE3 extension bar Ø25 x 150 mm long.
Software		
Software	-	Probe software for machine tools - see data sheet H-2000-2289.

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