

PH10 motorised heads and controllers



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PH10 series

Installation guide



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FCC and TÜV

FCC (USA)

Information to the user (FCC section 15.105)

NOTE: 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 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.

Information to user (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.

Special accessories (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 ensure compliance with FCC limits.

TÜV

This equipment has been independently certified by TÜV Product Services in accordance with OSHA (US) and SCC (Canada) requirements to the standards UL61010-1 Second Edition and CAN/CSA-C22-2 No. 61010-1 Second Edition.

EC DECLARATION OF CONFORMITY

Renishaw plc declare that the product: -

Name: PHC10-2 series

Description: Probe head controller

Part numbers: A-1368-XXXX series

has been manufactured in conformity with the following standards: -

BS EN 61326:1998/ A1:1998/A2:2001 Electrical equipment for measurement, control and laboratory use -
EMC requirements.
Immunity to annex A - industrial locations.
Emissions to class A (non-domestic) limits.

BSEN 60204-1:1998 Safety of machinery - Electrical equipment of machines -
Part 1: General requirements

BSEN 61010-1:2001 Safety requirements for electrical equipment for measurement, control
and laboratory use.
Part 1: General requirements.

and that it complies with the requirements of directives (as amended): -

89/336/EEC - Electromagnetic compatibility (EMC)

73/23/EEC - Low voltage

Signature.....

David R. Whittle
Laboratory Services Supervisor
Group Engineering
Renishaw plc

Dated: 20th December 2005

Reference no. ECD2005/21F

EN - Warnings

Pinch hazards exist between moving parts and between moving and static parts. Do not hold the probe head during movements, or when manually changing a probe.

Beware of unexpected movement. The user should remain outside 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.

There are normally no user-serviceable parts inside Renishaw mains-powered units. Return defective units to an authorised Renishaw Customer Service Centre.

Replace blown fuses with new components of the same type. Refer to the safety information in the relevant product documentation.

For instructions regarding the safe cleaning of Renishaw products, refer to the maintenance information in the relevant product documentation.

Remove power before performing any maintenance operations.

Refer to the machine supplier's operating instructions.

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.

The PHC10-2 is isolated from AC power by means of the mains switch on the rear panel. If any additional means of isolation is required, it must be specified and fitted by the machine manufacturer or the installer of the product. The isolator must be sited within easy reach of the CMM operator and comply with IEC61010 and any applicable national wiring regulations for the country of installation.

International safety instructions

- EN WARNING:** Please turn to appendix 1 and read the safety instructions in your own language before unpacking and installing this product.
- BG Внимание:** Моля, обърнете на приложение 1 и прочетете инструкциите за безопасност на вашия собствен език, преди за разопаковате и монтирате този продукт.
- CS UPOZORNĚNÍ:** Před rozbalením a instalací tohoto výrobku čtěte bezpečnostní pokyny uvedené v Příloze 1.
- DA SIKKEREDHED:** Læs sikkerhedsinstrukserne i Appendix 1 FØR udpakning og installation af dette produkt!
- DE SICHERHEITSANWEISUNGEN:** Lesen Sie die Sicherheitsanweisungen in Ihrer Sprache im Anhang 1 vor dem Auspacken und Installieren des Produktes.
- EL ΑΣΦΑΛΕΙΑ:** Πρέπει τώρα να γυρίσετε στο Κεφάλαιο 1 και να διαβάσετε τις οδηγίες ασφαλείας στη δική σας γλώσσα προτού ανοίξετε αυτό το προϊόν για να το εγκαταστήσετε.
- ES SEGURIDAD:** Debe volver al Apéndice 1 y leer las instrucciones de seguridad en su propio idioma antes de abrir e instalar este producto.
- ET HOIATUSED:** Nüüd peate vaatama 1. lisa ja enne selle toote lahtipakkimist ja paigaldamist lugema läbi ohutusjuhendi oma keeles.
- FI TURVALLISUUTTA:** Ennen tämän tuotteen pakkauksen avaamista ja asentamista lue liitteessä 1 olevat omalla kielelläsi kirjoitetut turvaohjeet.
- FR SECURITE:** Vous devez à présent consulter l'annexe 1 et les instructions de sécurité dans votre propre langue avant de déballer et d'installer ce produit.
- GA RABHADH:** Téigh chuig aguisín 1 agus déan na treoracha sábháilteachta a léamh i do theanga féin le do thoil sula ndéantar an táirge seo a dhíphacáil agus a shuiteáil.
- HU FIGYELMEZTETÉS:** Lapozzon a 1. függelékhez és olvassa el a biztonsági előírásokat az Ön saját nyelvén mielőtt kicsomagolná és beüzemelne a terméket.
- IT SICUREZZA:** Prima di aprire ed installare questo prodotto dovete leggere le istruzioni di sicurezza nella Vostra Lingua riportate nell'Appendice 1.
- LT ĮSPĖJIMAI:** Prieš išpakuojant ir įdiegiant produktą jums reikia grįžti prie 1 priedo ir perskaityti nurodymus dėl saugos savo kalba.
- LV BRĪDINĀJUMS:** Pirms šī izstrādājuma izsaiņošanas un uzstādīšanas jums jāiepazīstas ar 1. pielikuma drošības instrukcijām savā valodā.
- MT TWISSIJJET:** Issa għandek tmur f'appendiċi 1 sabiex taqra l-istruzzjonijiet tas-sigurtà fil-lingwa tiegħek qabel ma tispakkja u tinstalla dan il-prodott.

- NL VELIGHEID:** Ga nu naar Appendix 1 en lees de veiligheidsinstructies, in uw eigen taal, voordat u dit product uitpakt en installeert.
- PL BEZPIECZEŃSTWO:** Przed rozpakowaniem i instalacją produktu należy przeczytać załącznik nr 1 i zapoznać się z zasadami bezpieczeństwa w języku użytkownika.
- PT SEGURANÇA:** Você deve retornar ao Apêndice 1 e ler as instruções de segurança em seu idioma antes de desembalar e instalar este produto.
- RO ATENȚIE:** Înainte de a desface ambalajul și a instala acest produs, vă rugăm să căutați Anexa 1 și să citiți cu atenție instrucțiunile de protecția muncii, în limba română.
- SK VÝSTRAHY:** Pred rozbalením a inštaláciou tohto produktu si musíte pozrieť prílohu 1 a prečítať bezpečnostné pokyny vo vašom jazyku.
- SL OPOZORILA:** Sedaj morate v prilogi 1 prebrati varnostne napotke v svojem jeziku, preden odpakirate in namestite produkt.
- SV SÄKERHETSFÖRESKRIFTER:** Du måste nu gå till bilaga 1 och läsa säkerhetsinstruktionerna på ditt eget språk innan du packar upp och installerar denna produkt.

Safety

Electrical requirements

The PHC10-2 is powered from the a.c. mains supply via an IEC 320 connector. The operating voltages of the unit are as follows:

100 - 240 V ac +10%, -15% 47 - 66 Hz 30 W maximum

Fuse replacement

There are two 2 Amp (T) HBC slow-blow fuses which are used for all voltages (one is a spare). Fuses are replaced as follows:

1. Disconnect the mains power.
2. Use a screwdriver to lever out the fuseholder to reveal the fuse.
3. Remove the fuse and replace it with a 2 Amp (T) HBC 250 V 20 mm x 5 mm fuse, rating as IEC 127.
4. Replace the fuseholder.
5. Reconnect the mains power.



WARNING: Make sure that only fuses of the specified type are used for replacement.

This equipment must be connected to a protective earth conductor via a three core mains (line) cable. The mains plug shall be inserted only into a socket outlet provided with a protective earth contact. The protective earth contact shall not be negated by the use of an extension cable without protective conductor.



WARNING: Any interruption of the protective conductor may make the equipment dangerous. Make sure that the grounding requirements are strictly observed.

Environmental requirements

The following environmental conditions comply with those defined in BS EN61010-1:2001.

	Indoor use	IP30 (no protection against water)
	Altitude	Up to 2000 m
Operating temperature	PH10	+10 °C to +40 °C
	PHC10-2	0 °C to +50 °C
Storage temperature	PH10	-10 °C to +70 °C
	PHC10-2	-10 °C to +70 °C
Relative humidity	PH10	80% maximum for temperatures up to +31 °C Linear decrease to 50% at +40 °C
	PHC10-2	80% maximum for temperatures up to +31 °C Linear decrease to 50% at +50 °C
	Transient overvoltages	Installation category II
	Pollution degree	2

1 Introduction

This guide describes the installation of the PH10 series of motorised probe heads and the PHC10-2 probe head controller.

The guide gives information on physical installation, system connections, communications and interface settings, as well as assistance in fault-finding during the installation of a system.



WARNING: The components of the PH10 system are not compatible with PH9 system components. No attempt should be made to connect PH10 system components to a PH9 system, as this will result in damage to the product.

The guide should be read in conjunction with the PH10 series user's guide (Renishaw part number H-1000-5070) in order to fully understand the system's features, capabilities and operation.

Associated documentation

Title	Part number
PH10 series user's guide	H-1000-5070
HCU1 hand control unit user's guide	H-1000-5016
AM1 adjustment module user's guide	H-1000-4010
AM2 adjustment module - new product information sheet	H-1000-2051
Touch-trigger probe user's guide	H-1000-5021
Styli and accessories - technical specifications	H-1000-3200
Basic command set for indexing heads programmer's guide	H-1000-5075
PICS installation guide	H-1000-5000
Probing systems for co-ordinate measuring machines - technical specifications	H-1000-5050

2 System description

2.1 PH10 series motorised probe heads

Each of the heads in the PH10 motorised probe head range is a general purpose, versatile unit designed specifically for use on direct computer controlled (DCC) coordinate measuring machines (CMMs).

The range comprises three heads:

- PH10T
- PH10M
- PH10MQ

All the heads in the range incorporate the following features:

- 720 indexing positions
- 0.5 μm (2σ) indexing repeatability
- 7.5° indexing steps in both axes
- 300 mm extension bar capability

Additionally, the PH10M and PH10MQ heads offer the following features:

- Autochange compatibility
- Multiwired probe compatibility

See the PH10 series user's guide (Renishaw part number H-1000-5070) for test conditions and full specification.

Figure 1 shows the shank-mounted PH10T motorised probe head fitted with a TP200 probe.

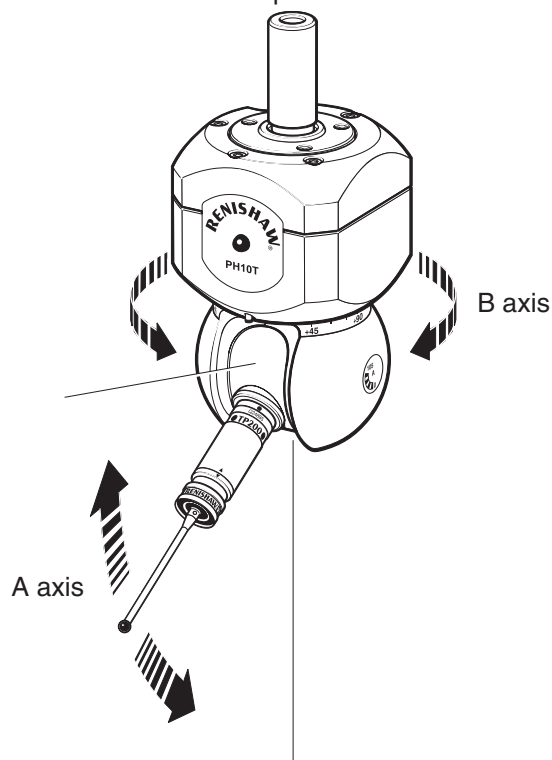


Figure 1 - PH10T with TP200

Figure 2 shows the shank-mounted PH10M motorised probe head fitted with an AM1 adjustment module and a TP7M probe.

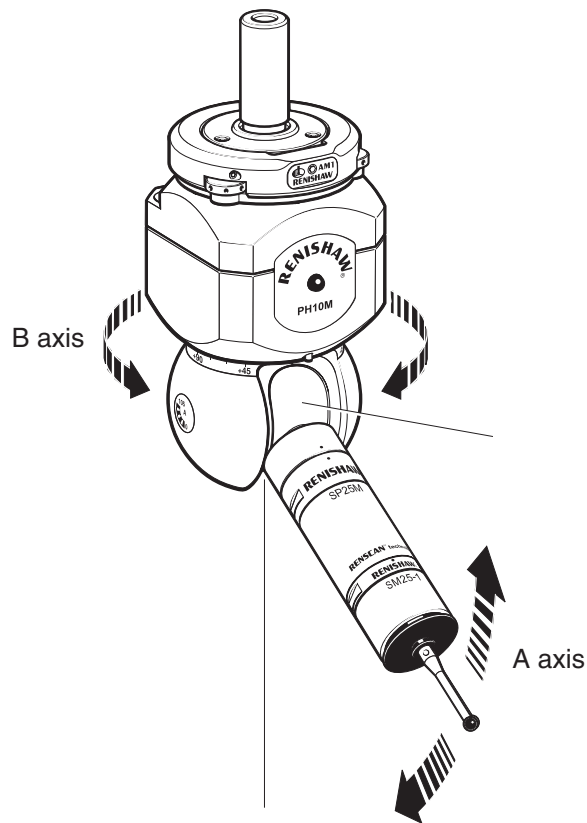


Figure 2 - PH10M with AM1 and TP7M

Figure 3 shows the quill-mounted PH10MQ motorised probe head fitted with an AM2 adjustment module and a TP7M probe.

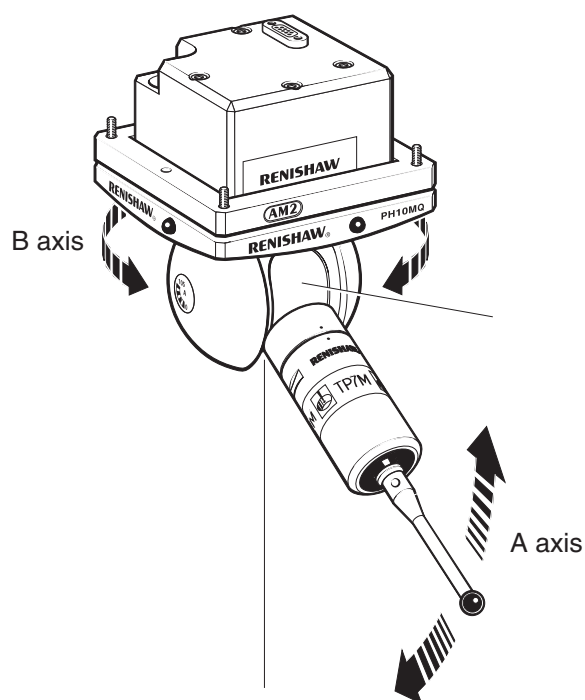


Figure 3 - PH10MQ with AM2 and TP7M

2.2 PHC10-2 probe head controller

The PH10 series of motorised probe heads can only be used in conjunction with the PHC10-2 controller. The PHC10-2 incorporates an integral power supply for the PH10 series of heads, manages all head functions and communicates via a suitable interface with the CMM's computer. The PHC10-2 does not manage probe functions as it passes signals out to interfaces for this.

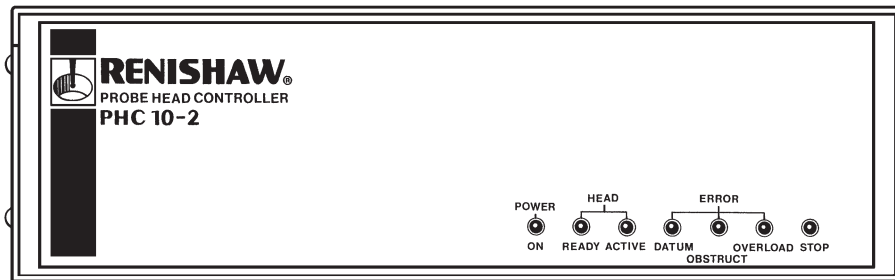


Figure 4 - PHC10-2 controller

The PHC10-2 is available in two versions:

- PHC10-2 RS232 (see section 4)
- PHC10-2 IEEE (see section 5)

2.3 PH10 system layout

Figure 5 shows the PH10T/PH10M and PHC10-2 used in conjunction with two-wire touch-trigger probes and appropriate interface.

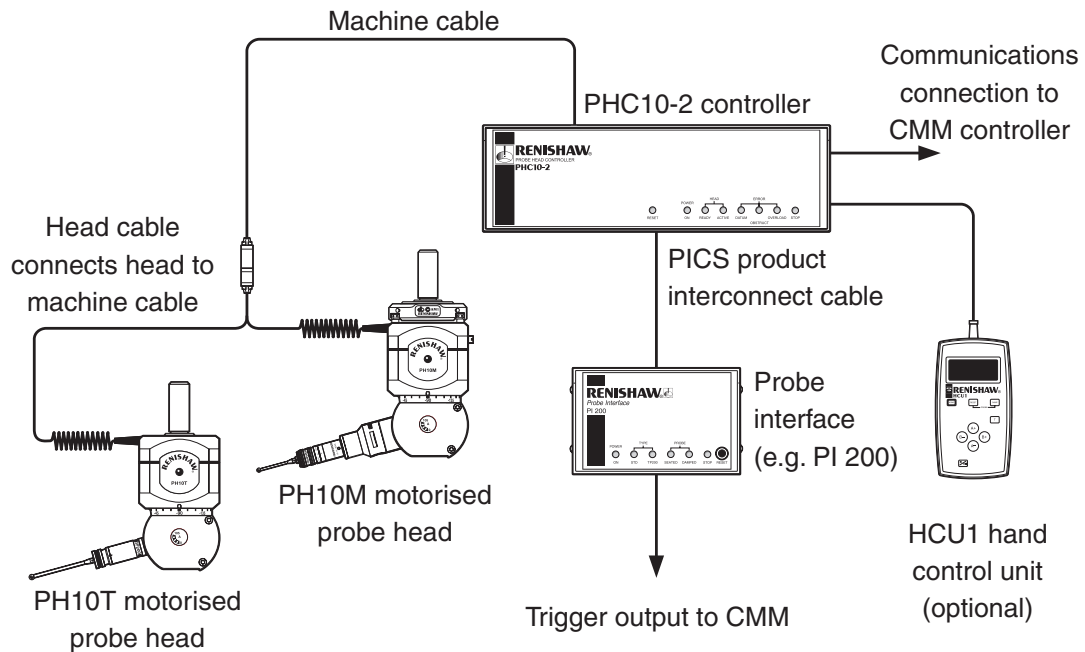


Figure 5 - PH10T / PH10M with two-wire probe

Figure 6 shows the PH10M and PHC10-2 used in conjunction with multiwired probes and appropriate interface.

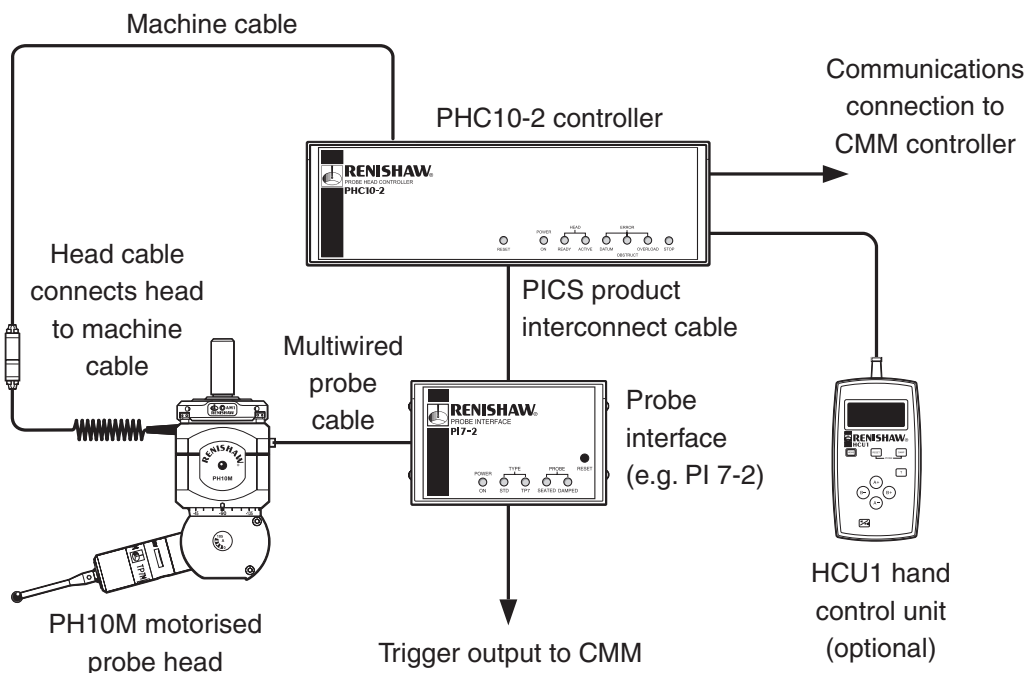


Figure 6 - PH10M with multiwired probe

2.4 Probes, extensions and styli

Figure 7 shows the range of extensions, probes and styli which can be used in conjunction with the PH10T head.

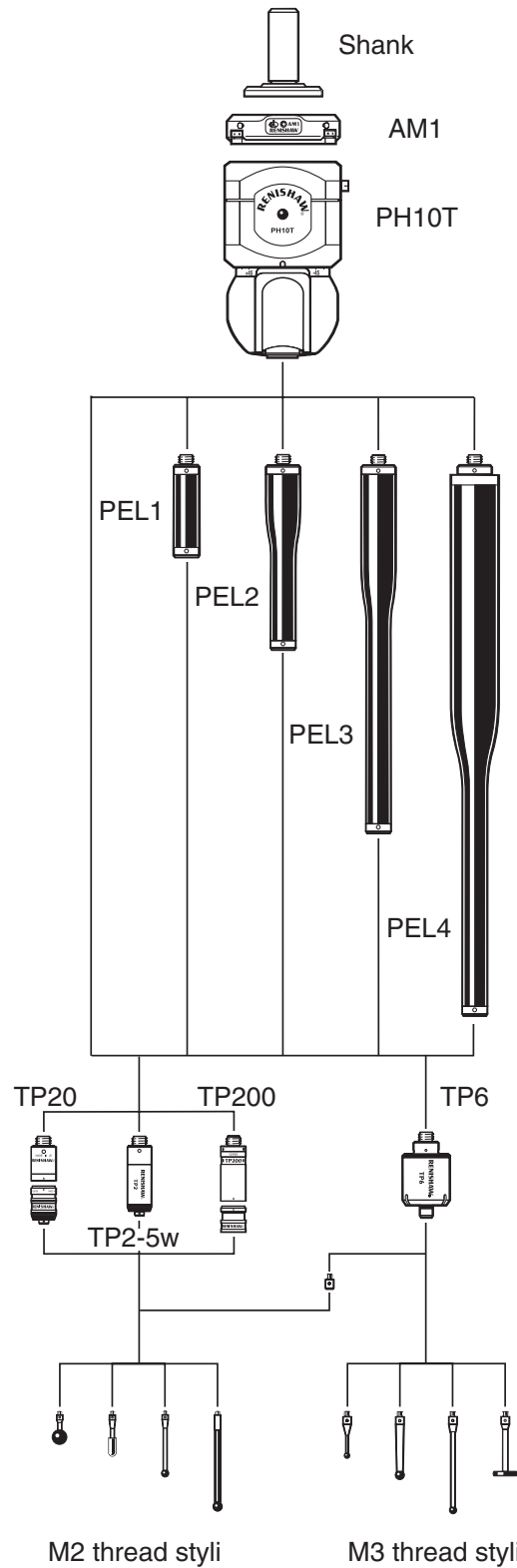


Figure 7 - Probes, extensions and styli for PH10T

Figure 8 shows the range of extensions, probes and styli which can be used in conjunction with the PH10M and PH10MQ heads.

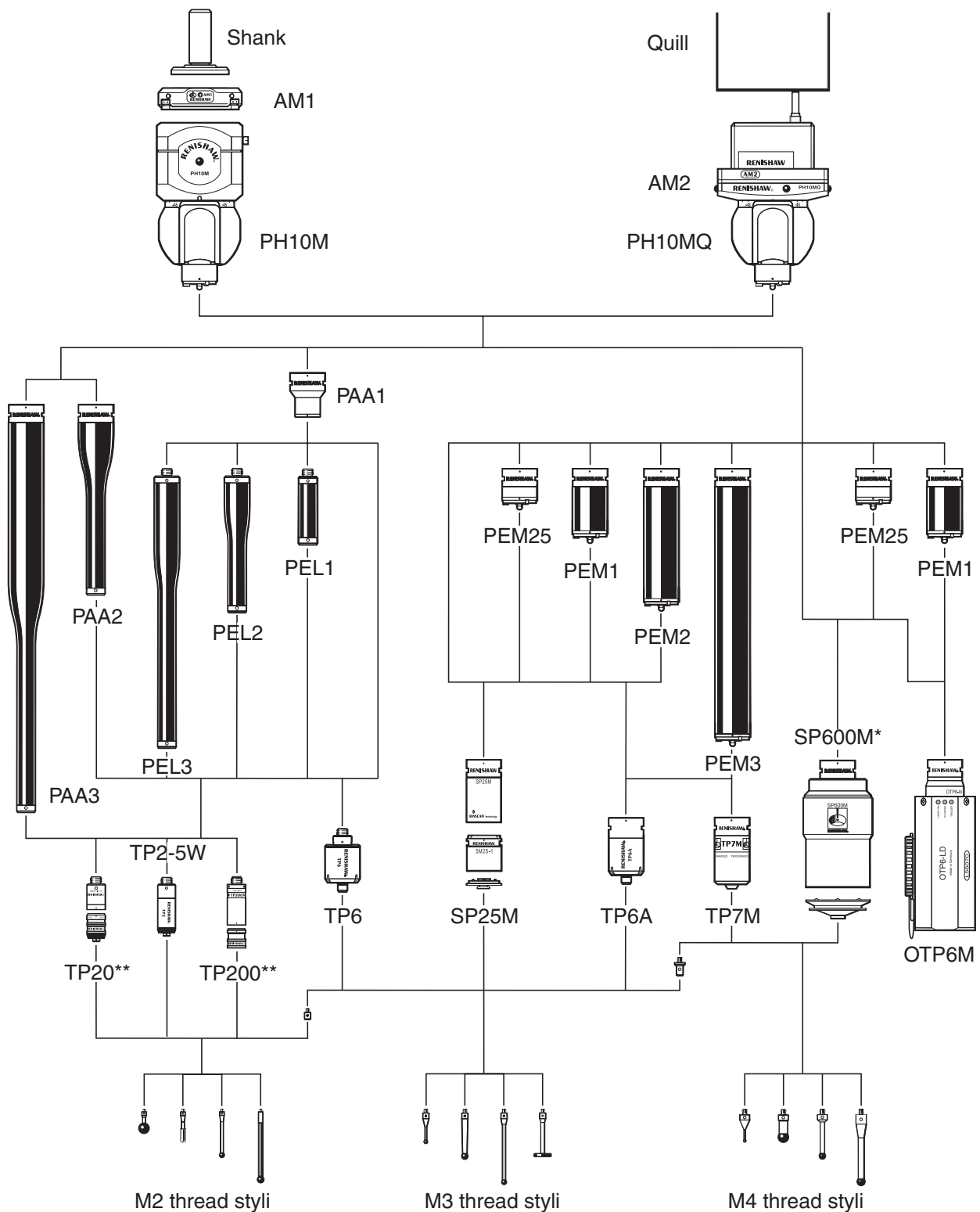


Figure 8 - Extensions, probes and styli

* When using a PH10MQ with SP600M a PEM25 extension bar is required to achieve $A = 97.5^\circ$ or $A = 105^\circ$ in all B-axis positions.

** TP20, TP200 and SP25M are only shown with one module. Other modules are also available, for further details refer to the necessary users guides H-1000-5008, H-1000-5014 and H-1000-5104 respectively.

The maximum cable length for the PH10 system is 50 m, on condition that the maximum single wire resistance is less than 2.5 Ω .

The mechanical specification for Renishaw cables is as follows:

- Life: 1×10^6 180° \varnothing 70 mm rolling bends
- \varnothing 6.7 mm overall cable diameter
- Continuous screen

See section 6.6 for cable specifications and connections.

3 Installation

3.1 Installation and dimensions of PH10 series heads

Figure 9 shows the dimensions of the shank-mounted PH10T head.

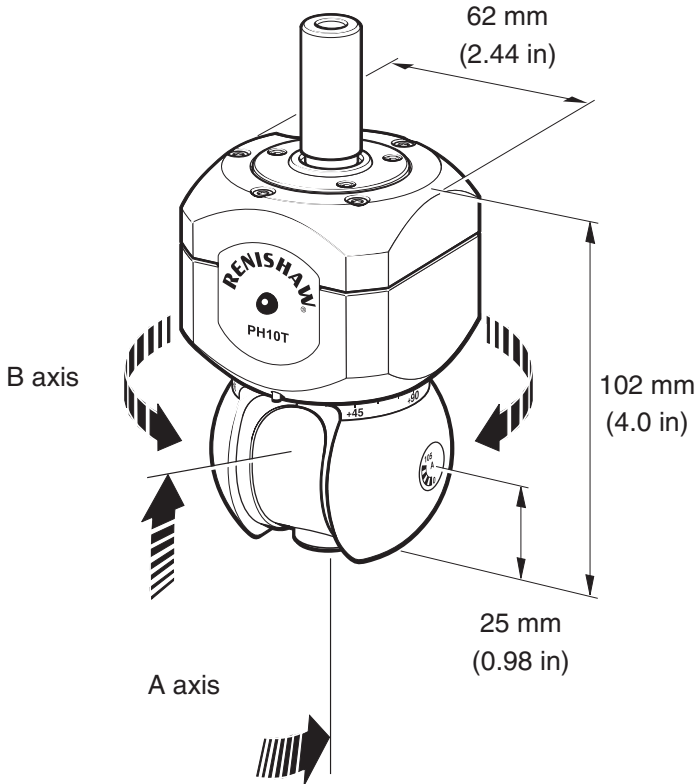


Figure 9 - Dimensions for PH10T

CAUTION: Always fit mounting shanks with the screws supplied (M3 x 5 mm long). The use of incorrect screws may cause serious internal damage to the head.

The PH10T fits any standard shank. It may be used in conjunction with the Renishaw AM1 adjustment module (see section 9.2).

Figure 10 shows the dimensions of the shank-mounted PH10M.

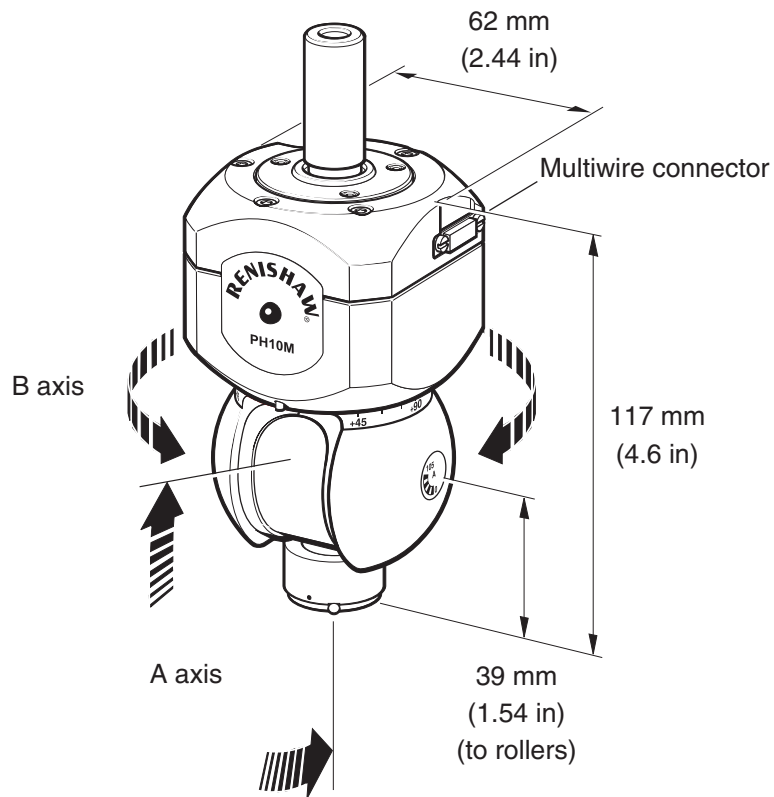


Figure 10 - Dimensions of PH10M



CAUTION: Always fit mounting shanks with the screws supplied (M3 x 5 mm long). The use of incorrect screws may cause serious internal damage to the head.

The PH10M fits any standard shank. It may be used in conjunction with the Renishaw AM1 adjustment module (see section 9.2).

Figure 11 shows the dimensions of the quill-mounted PH10MQ head.

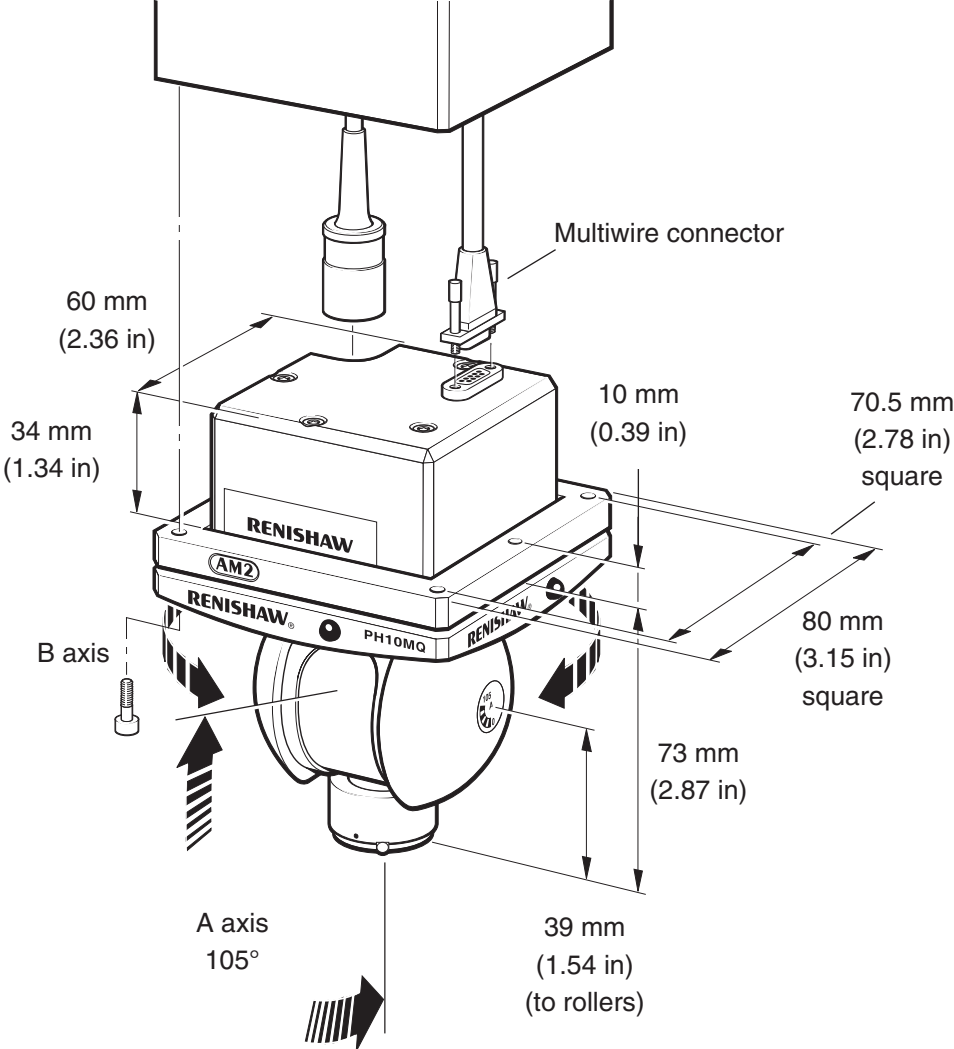


Figure 11 - Dimensions of PH10MQ

3.2 Installation of PHC10-2 controller

Both versions of the PHC10-2 controller can be used in a 19" rack system or as a stand-alone unit.



WARNING: Ensure the controller is disconnected from the mains supply during installation.



WARNING: Take care not to exceed the operation ambient of 50 °C around the unit. Do not install near sources of heat. Forced cooling may be required in final installation.

The dimensions of the controller are as follows:

Width:	290 mm (11.42 in)
Height:	88 mm (3.46 in)
Depth:	220 mm (8.66 in)
Weight:	2.8 kg (98.7 oz)

NOTE: Use the mounting screws supplied with this equipment. DO NOT replace with longer screws as damage could occur.

3.2.1 Stand-alone installation

Four self-adhesive rubber feet are supplied with the unit for stand-alone use.

3.2.2 Mounting alone in a 19" rack

Figure 12 shows the PHC10-2 ready for mounting to a 19" rack.

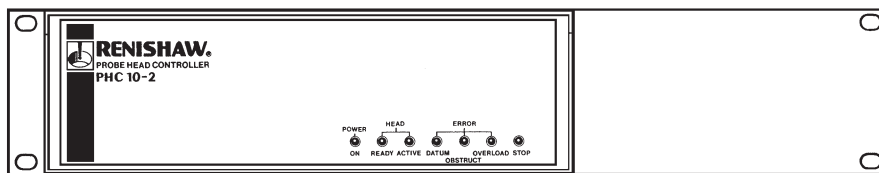


Figure 12 - Mounting PHC10-2 in a 19" rack

Remove the blanking plugs from the side panels of the PHC10-2 and fit the blanking panel (2) and rack mounting bracket (1) using the screws supplied as shown in figure 13.

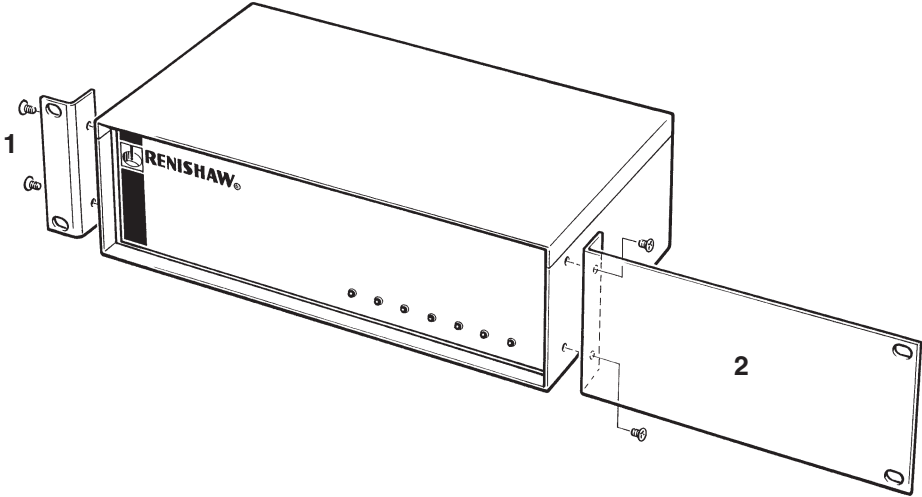


Figure 13 - Fitting blanking panel and rack mounting bracket

The rack mounting bracket kit (1) is part number A-1018-0124.

The blanking panel kit (2) is part number A-1018-0123.

3.2.3 Mounting next to an interface

Figure 14 shows the PHC10-2 with a PI 200 interface ready for mounting to a 19" rack.



Figure 14 - PHC10-2 with PI 200

Remove the blanking plugs from the side panels of the PHC10-2. Fit a rack mounting bracket (1) and an enclosure link bracket kit (3) using the screws provided as shown in figure 15.

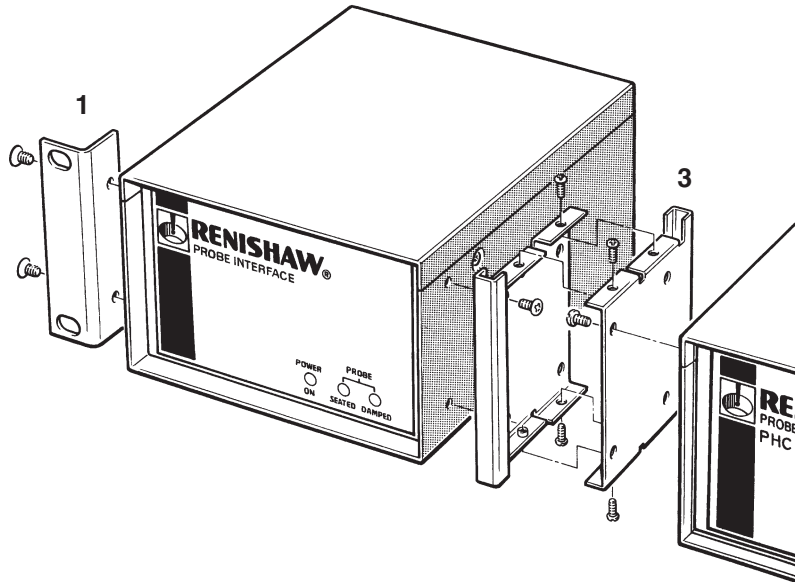


Figure 15 - Fitting brackets to the interface

The enclosure link bracket kit (3) is part number A-1018-0126.

The enclosure link brackets must be fitted in the orientations shown. Fit the brackets to the units before fitting the brackets together. Using the screws provided, fit together the PHC10-2 and the interface. The completed assembly is now ready for fitting to the rack.

4 RS232 serial communications

Figure 16 shows the rear panel of the RS232 version of the PHC10-2.

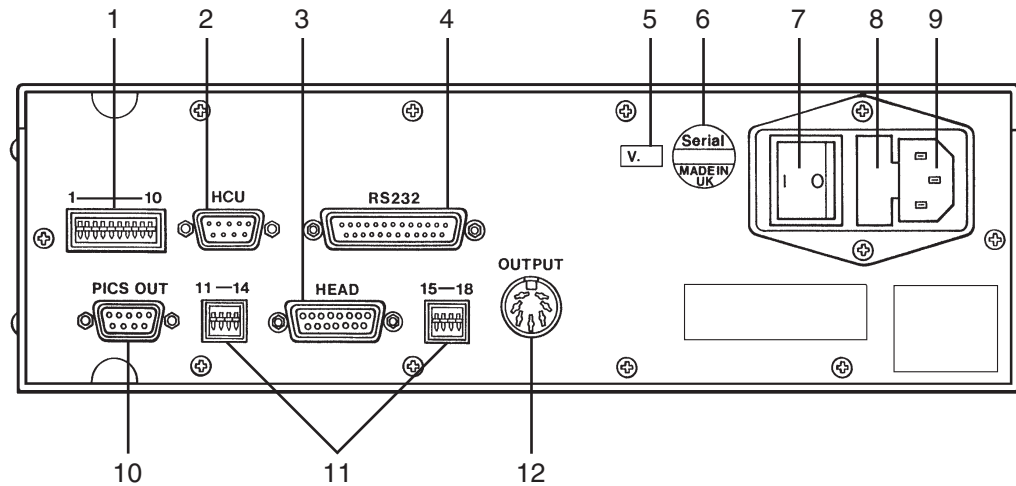


Figure 16 - PHC10-2 rear panel (RS232)

Key

- 1 Communications protocol selection, switches 1 to 10 (see tables 2, 3 and 4)
- 2 9-way D-type connector to HCU1
- 3 15-way D-type connector to probe head (see table 14)
- 4 25-way D-type RS232 communications connector to CMM computer (see table 1)
- 5 Version number label
- 6 Serial number label
- 7 Mains power ON/OFF switch
- 8 Fuseholder
- 9 Mains power input
- 10 9-way D-type plug for PICS output (see table 11)
- 11 Probing system format selection, switches 11 to 14 and 15 to 18 (see section 6)
- 12 7-pin DIN output connector to probe interface (see section 6.4.2)

4.1 RS232 connector pinouts

The PHC10-2 communicates with the CMM computer via the RS232 cable as shown in table 1.

Pin	Signal
1	Screen
2	Transmitted data (Tx) to CMM computer
3	Received data (Rx) from CMM computer
4	RTS (Request To Send) to CMM computer +12V after initialisation routine completed
5	CTS (Clear To Send) from CMM computer CMM computer disasserts CTS to halt PHC10-2 transmissions Connect pin 5 to pin 20 if CTS is not output from the CMM computer
7	Signal ground (common)
20	DTR (Data Terminal Ready) to CMM computer signifies PHC10-2 power ON condition

4.2 Baud rate selection

The baud rate is set using switches 1 to 3 as shown in table 2 below:

Baud rate	Switch 1	Switch 2	Switch 3
300	DOWN	DOWN	DOWN
600	UP	DOWN	DOWN
1200	DOWN	UP	DOWN
2400	UP	UP	DOWN
4800	DOWN	DOWN	UP
9600	UP	DOWN	UP
19200	DOWN	UP	UP



CAUTION: The PHC10-2 must be powered down and then powered up to allow any changes to the rear panel switch settings to take effect.

4.3 Protocol selection

The RS232 version of the PHC10-2 has two switch-settable command sets (basic command set and extended command set) offering different protocol options.

The command set selection is made using switch 9 on the rear panel.

Switch	Position	Selection
9	UP	Extended command set mode
	DOWN	Basic command set mode

4.3.1 Basic command set mode

In this mode the PHC10-2 is fully compatible with existing integration methods in terms of communications protocols, software command set and RS232 protocol options.

To select the basic command set mode and protocol, set switch 9 (command set selection) DOWN.

When this mode is chosen, the following protocol options are available (table 4).

Table 4 - Basic command set protocol		
Switch	Position	Selection
6	UP	2 stop bits
	DOWN	1 stop bit
7	UP	CTS (Clear To Send) ON
	DOWN	CTS (Clear To Send) OFF
8	UP	LF (Line Feed) ON
	DOWN	LF (Line Feed) OFF

NOTE: Switches 6, 7 and 8 have no effect when switch 9 is UP.

Data transmission format is as follows:

- 1 start bit
- 7 data bits
- 1 parity bit (ignored on Rx: always 0 on Tx)
- 1 or 2 stop bits (switch 6)

Protocols:

PHC10-2 RTS is asserted before first transmission from the head and remains asserted. If switch 7 is UP, CTS must be asserted by the CMM computer to allow the head to transmit. If switch 8 is UP, the PHC10-2 will add an ASCII LF character to every transmitted message.

4.3.2 Extended command set mode

In this mode the PHC10-2 uses the Renishaw extended command set. It is completely different from and incompatible with the basic command set. The RS232 protocol is fixed with no user selectable options other than baud rate (see section 4.2).

NOTE: The extended command set has not been implemented on the IEEE version of the PHC10-2.

The extended command set offers the following advantages over the basic command set:

- Software control of the hand control unit (HCU1) functions such as jog and sweep
- Software control of selected PICS (product inter-connection system) functions such as probe DAMPING, probe power OFF and LED OFF
- Software control of selected probe functions (TP200 probe reset)
- Common communications protocol for products using the extended command set
- As probing systems become increasingly sophisticated and offer a wider range of functions and control options, they will be incorporated into the new command structure, reducing integration times and costs for CMM manufacturers
- The introduction of product identifiers and device numbers will enable control of multiple Renishaw interfaces in future implementations of the extended command set

Please refer to Renishaw for further details of the extended command set.

To select the extended command set mode and protocol, set switch 9 (command set selection) UP.

NOTE: The functions of switches 6, 7 and 8 will have no effect on the system when switch 9 is UP.

In extended command set mode, the data transmission and protocol formats are fixed in line with modem RS232 conventions. There are no user selectable options.

Data transmission format is as follows:

1 start bit

7 data bits

1 even parity bit

1 stop bit

Protocol:

PHC10-2 RTS is normally asserted. It is unasserted when the PHC10-2 is unable to receive further transmissions.

The PHC10-2 CTS must be asserted (by the CMM computer, or by linking DTR to CTS) to allow the PHC10-2 to transmit.

XON/XOFF:

The extended command set supports the use of XON/XOFF flow control by the CMM computer.

If the PHC10-2 receives an XOFF character, PHC10-2 transmissions will cease and be buffered until an XON character is received by the PHC10-2 or the output buffer overflows.

It is possible to continue transmissions to the PHC10-2 while it is in the XOFF state, although this is not recommended as it may cause overflow of the output buffer, resulting in lost responses.

5 IEEE parallel communications

Figure 17 shows the rear panel of the PHC10-2 IEEE.

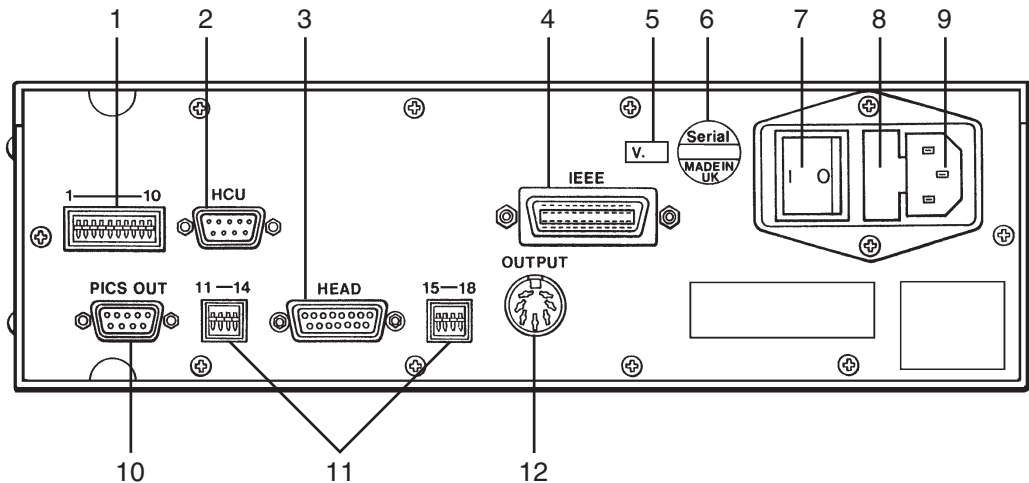


Figure 17 - PHC10-2 rear panel (IEEE)

Key

- 1 Communications protocol selection, switches 1 to 10 (see table 6)
- 2 9-way D-type connector to HCU1
- 3 15-way D-type connector to probe head (see table 14)
- 4 24-way D-type IEEE communications connector to CMM computer (see table 5)
- 5 Version number label
- 6 Serial number label
- 7 Mains power ON/OFF switch
- 8 Fuseholder
- 9 Mains power input
- 10 9-way D-type connector for PICS output (see table 11)
- 11 Probing system format selection, switches 11 to 14 and 15 to 18 (see section 6)
- 12 7-pin DIN output connector to probe interface (see section 6.4.2)

5.1 IEEE connector pinouts

The PHC10-2 IEEE488 connector is compatible with any standard IEEE488 cable. The pin numbers and signals are given in table 5.

Table 5 - IEEE connector pinouts			
Pin	Signal	Pin	Signal
1	D101	13	D105
2	D102	14	D106
3	D103	15	D107
4	D104	16	D108
5	EOI(24)	17	REN(24)
6	DAV	18	GND(6)
7	NRFD	19	GND(7)
8	NDAC	20	GND(8)
9	IFC	21	GND(9)
10	SRQ	22	GND(10)
11	ATN	23	GND(11)
12	Shield	24	GND LOGIC

GND(n) refers to the signal ground return of the reference contact.

D101 - D108, EOI and REN return on contact 24.

5.2 IEEE488 capability

The PHC10-2 IEEE incorporates the following capability codes according to the standard IEEE488-1978:

SH1
 AH1
 T6
 TE0
 L4
 LE0
 RL1
 PP2
 SR1
 E1/2
 DC1
 C0

5.3 Protocol selection

The IEEE488 device address is selected via switches 1 to 5 using binary code (see table 6). The range is 1-30. Switch 1 is the least significant bit.

The parallel poll bit is selected via switches 6 to 8 using binary-plus-one code (see table 6). The range is 1-8. Switch 6 is the least significant bit.

Select the DOWN position to set each bit.



CAUTION: The PHC10-2 must be powered down before switch settings are changed. Changes will take effect when power is switched on.

Table 6 - IEEE PROTOCOL SELECTION			
Switch	Binary code		
1	1	Least significant bit	Device address range 1 - 30
2	2		
3	4		
4	8		
5	16		
6	1	Least significant bit	Parallel poll range 1 - 8
7	2		
8	4		

For example:

Switches 1, 2 and 6 DOWN - Address 3, Parallel poll bit 2

Switches 6, 7 and 8 DOWN - Address 0, Parallel poll bit 8

6 Probing system output (RS232 and IEEE)

Both versions of the PHC10-2 have a further eight configuration switches (switches 11 to 18) on the rear panel. These allow selection of output configurations for interconnections.

Not all of the switches are used. They are included on the controller to allow a standard switch configuration for the range of Renishaw's motorised head controllers.

NOTE: If a switch has no specified function, it should be set in the DOWN position.

6.1 PICS interface configuration

If the PHC10-2 is to be used in a PICS linked system, the configuration option is selected using switch 11 (see table 7).

Table 7 - PICS interface configuration			
Switch	Description	Position	
11	PICS configuration	UP	PPOFF and PDAMP active during head index
		DOWN	PDAMP only active during head index

6.2 Interface connection

If the PHC10-2 is to be used in a 5 pin or 7 pin linked system, the configuration option is selected using switches 17 and 18 (both UP or both DOWN) (see table 8).

Table 8 - Interface connection			
Switch	Description	Position	
17 and 18	Interface connection	UP	PICS or 7-pin DIN operation: the PHC10-2 internal inhibit relay disables the interface during a head index
		DOWN	5-pin DIN operation only: the PHC10-2 internal inhibit relay disables the probe during a head index

6.3 HCU1 operation

When the system is used in conjunction with an HCU1 hand control unit (see section 9.1), the probe damp and probe reset buttons on the HCU1 are active.

- The probe reset button will pulse the PPOFF PICS line when pressed, but only while the system is in manual mode.
- The probe damp button will toggle the PDAMP PICS line when pressed, but only while the system is in manual mode.
- Both the probe reset and probe damp buttons on the HCU1 can be made inactive by use of a switch on the rear panel of the PHC10-2 (see table 9).

Table 9 - HCU1 operation			
Switch	Description	Position	
12	Operation of HCU1 probe DAMPING and probe reset	UP	Enabled
		DOWN	Disabled

6.4 Output configuration

The PHC10-2 can be connected to a probe interface via the PICS connection (9-way D-type connector) or via the SSR connection (7 pin DIN connector).

The configuration of the probe interface connection is selected by use of switches 15 and 16 as detailed in table 10.

Table 10 - Output configuration			
Switch	Description	Position	
15 and 16	Output configuration	UP	PICS
		DOWN	DIN

6.4.1 PICS output

Renishaw's PICS (product inter-connection system) allows a standard method of connection for real-time signals used by current Renishaw products and gives access to probing system control features through the DIN SSR connection.

The following descriptions (see table 11 on page 33) are specific to PHC10-2 PICS connections. Please refer to the PICS installation guide (Renishaw part number H-1000-5000) for further information.

Table 11 - PICS connector pinouts			
Pin	Signal	Position	
1	STOP	This signal is active when low and is responded to, and can be asserted by the PHC10-2. See Section 8 for an explanation of the conditions which will cause the PHC10-2 to assert STOP, and the reaction of the PH10 system to an external STOP signal.	Read from PHC10-2 to indicate an error in the PH10 system. Pull down to 0 V to indicate a STOP condition external to the PH10 system.
2	PPOFF (probe power OFF)	PPOFF is an active low inhibit signal which can be set by the CMM computer or the PHC10-2. PPOFF is overridden by the use of the STOP signal.	Pull down to 0 V to turn off power to the probe.
3	0 V	This the common reference and return path for all signals.	-
4	LED anode	This is a constant current input, normally from the interface to illuminate the head LED.	-
5	Probe signal	This pin and pin 9 transmit the probe output signals from the PHC10-2 when a multiwire cable is not in use. As these signals have not been interfaced, it is important that the PICS cable between the PHC10-2 and the interface is less than 0.5 m (1.6 ft) otherwise interference from other PICS signals can occur.	-
6	SPARE	-	-
7	PDAMP (probe DAMPing)	PDAMP is an active low signal which can be set by the CMM computer, the PHC10-2 or by the optional HCU1. PDAMP can influence an interface by reducing electronically the sensitivity of a strain gauge based probe. It can inhibit a Renishaw interface, when standard touch trigger probes are in use, until the probe has been continuously triggered for at least 5 ms. The signal can be asserted by the CMM computer to reduce the sensitivity of the probe. This will reduce unwanted triggers during CMM acceleration, or vibration during position moves, whilst maintaining crash protection.	Pull down to 0 V to partially inhibit the probe during rapid moves.
8	LEDOFF	This signal is not asserted by the PHC10-2, but it responds to LED OFF by switching the head LED off.	-
9	Probe return	See pin 5	-
	Screen	-	-

6.4.2 SSR output

The pin numbers and descriptions are given in table 12.

Table 12 - SSR connector pinouts			
Pin	Description	Pin	Description
1	Head LED cathode	5	Probe signal
2	Ground	6	Probe inhibit
3	HEAD LED cathode	7	Probe inhibit
4	Probe return		

6.5 Probe reset time

The probe reset timer on the PHC10-2 unit (later than version 5) is designed to be used where the touch probe fails to remain seated following a head index move.

The timer enables the duration permitted for a probe reseal to be extended. It is designed to be used in the event that a probe fails to rearm following a head index when using long extension bars.

Table 13 - Probe reset time			
Switch	Description	Position	
10	Time permitted for probe to reseal following a head index	UP	Level 2 (extended)
		DOWN	Level 1 (standard)

6.6 Head connector and cables

Head cable numbers, descriptions and currents are set out in table 14.

NOTE: For maximum immunity from electrical noise, Renishaw recommends that:

1. Mating connectors must be metal bodied.
2. The overall cable screen is continuous and connected to the system ground on the user's equipment through the bodies of the connectors.



CAUTION: For correct system function, the maximum overall single core resistance between the head and PHC10-2 should be 2.5Ω.

Table 15 shows the range of standard motorised head cables available from Renishaw.

Signal name	Machine cable			Probe head cable		Maximum line current
	15-way male D-type connections	Cable PLM 6, 7, 8, 9	14-way LEMO connections	12 core coiled cable colours	14-way TUCHEL socket female connections	
"B" axis feedback	14	Black	(F) 1 (M)	Yellow	E	n/a
Ground sense	1	Brown	(F) 2 (M)	Red	D	n/a
dc reference 12 V	6	Violet	(F) 3 (M)	Brown	C	n/a
0 V	4	Green/red	(F) 4 (M) *	Grey	M	1000 mA
Locking motor 8V dc nominal	10	Green	(F) 5 (M)	White	H	350 mA
"A" axis motor 12 V dc nominal	12	Red	(F) 6 (M)	Green	L	350 mA
Head present	2	Turquoise	(F) 7 (M) *	Not connected	-	-
"A" axis motor 12 V dc nominal	11	White	(M) 8 (F)	Dark blue	F	350 mA
"B" axis motor/probe contact	7	Pink	(M) 9 (F)	Violet	A	350 mA
"B" axis motor/probe contact	15	Orange	(M) 10 (F)	Black	B	350 mA
Screen	Body	Screen	(M) 11 (F)	Screen	N,O	-
"A" axis feedback	3	Yellow	(M) 12 (F)	Orange	G	n/a
LED + datum	8	Blue	(M) 13 (F)	Turquoise	J	15 mA
Motor probe switch	5	Grey	(M) 14 (F)	Pink	K	40 mA

* **NOTE:** The male pins numbered 4 and 7 of the 14 way LEMO connector are linked together.

Cable type		Length	Coiled or plain	Connector	Connects to	Connector	Connects to
Probe head cable (PHC)	PL5	0.4 - 0.8 m	C	PH10 style TUCHEL	Head	14-pin LEMO plug	MC
	PL6	0.8 - 1.8 m	C				
	PL12	0.1 m	P				
	PL13	0.1 - 0.2 m	C				
Machine cable (MC)	PLM6	6.0 m	P	15-pin D-plug	PHC10-2	14-pin LEMO	Chassis socket
	PLM7	4.0 m	P				Line socket
	PLM8	6.0 m	P				
	PLM9	4.0 m	P				

6.7 Summary of configuration switches

6.7.1 Summary of RS232 configuration switches

Table 16 presents a summary of the PHC10-2 RS232 configuration switch settings and functions.

Table 16 - Summary of RS232 configuration switches					
Switch	Function	Up		Down	See section
Communications					
1 2 3	Baud rate	See table 2			4.2
4 5	None	Default position = down			
6* 7* 8*	Stop bit CTS protocol LF protocol	2 stop bits CTS on LF on	1 stop bit CTS off LF off		4.3.1
9	Command set	Extended	Basic		4.3
10	Probe reset time	2 (extended)	1 (standard)		6.5
Interface					
11	PICS configuration	PPOFF - active during head index	PPOFF - inactive during head index		6.1
12	HCU1 probe DAMP and probe reset buttons	Enabled	Disabled		6.3
13 14	None	Default position = down			
15 16	Output configuration	PICS	DIN		6.4
17 18	Interface connection	PICS or 7-pin DIN operation	5-pin DIN operation only		6.2

* Operational only when basic command set selected (switch 9 down).

6.7.2 Summary of IEEE configuration switches

Table 17 presents a summary of the PHC10-2 IEEE configuration switch settings and functions.

Table 17 - Summary of IEEE configuration switches				
Switch	Function	Up	Down	See section
Communications				
1 2 3 4 5	Device address (1-30)	See table 6		5.3
6 7 8	Parallel poll bit (1-8)			
9	None	Default position = down		
10	Probe reset time	2 (extended)	1 (standard)	6.5
Interface				
11	PICS configuration	PPOFF - active during PH10 index	PPOFF - inactive during head index	6.1
12	HCU1 probe DAMP and probe reset buttons	Enabled	Disabled	6.3
13 14	None	Default position = down		
15 16	Output configuration	PICS	DIN	6.4
17 18	Interface connection	PICS or 7-pin DIN operation	5-pin DIN operation only	6.2

7 PHC10-2 front panel LEDs

Figure 18 shows the front panel of the PHC10-2. The names, colours and functions of the LEDs are given in table 18.

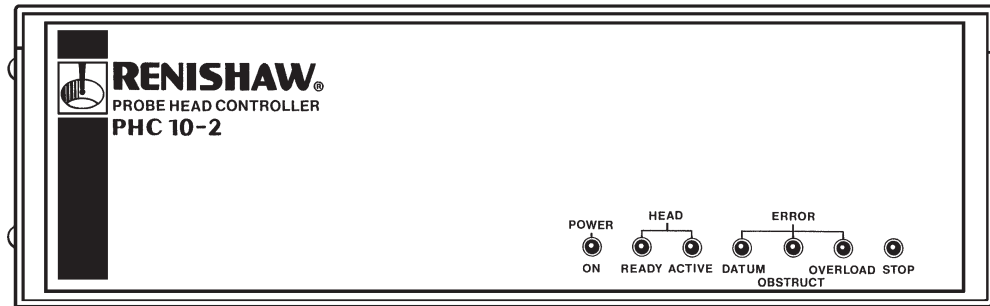


Figure 18 - PHC10-2 front panel

Table 18 - PHC10-2 LEDs		
Name	Colour	Function
POWER ON	Green	Mains power ON when lit
HEAD READY	Green	Head ready for use when lit
HEAD ACTIVE	Yellow	Head indexing when lit
DATUM ERROR	Red	Head datum error when lit
OBSTRUCT ERROR	Red	Head obstruct error when lit
OVERLOAD ERROR	Red	Head overload error when lit
STOP	Red	PHC10-2 asserting PICS STOP when lit

8 PICS stop signal

The PHC10-2 will assert STOP under the following conditions (table 19):

Condition	Notes
Overload error	The head has been overloaded while locked, causing it to unlock.
Obstruct error	The head has been obstructed while moving to the requested position and is unable to reach that position, or is unable to lock into it.
Head disconnect	STOP will be asserted for two seconds if the head is disconnected. It is reset after this period.
Power failure	Because STOP is an active low signal, it will effectively be asserted if mains power is removed from the PHC10-2.

The reaction to assertion of PICS STOP to the system and effect of the signal removal are set out in table 20.

System state	Reaction	Removal of external STOP
STOP asserted on power up. Head locked.	Normal system start up. Head will report its position.	Head movement commands accepted.
System in manual mode. Manual movement initiated by HCU1 after STOP asserted.	Single step manual movement only. Continuous movement disabled. Head can be moved slowly as a 'safeguard movement'. Head will lock up as normal when movement key released.	Continuous movement enabled.
System in manual mode. STOP asserted during manual move by HCU1.	Continuous head movement immediately disabled. Head will continue to move in single steps. Head will lock up as normal when movement key released.	Continuous movement enabled.
System in automatic mode. STOP asserted before update command received.	PHC10-2 will not unlock or index the head.	Normal system operation resumed.
System in automatic mode. STOP asserted during a head move.	Power immediately removed from axis motors. Motors braked.	An update command will cause the head to complete its move.

9 Accessories

9.1 HCU1 hand control unit

The HCU1 is a remote hand control unit which enables the head to be used in manual mode or with a teach cycle. An LCD dot matrix display provides information and status of the system.

See the HCU1 user's guide (Renishaw part number H-1000-5016) for further information on the features and operation of the unit, or contact your Renishaw representative for advice.



Figure 19 - HCU1 hand control unit

9.2 AM1 adjustment module

The PH10T and PH10M have been designed to be mounted in any orientation, using a standard shank, to suit your machine.

They can also be fitted with the AM1 adjustment module. This allows fine adjustment in pitch, roll and yaw, enabling the head to be aligned accurately with the machine's axes (see figure 20).

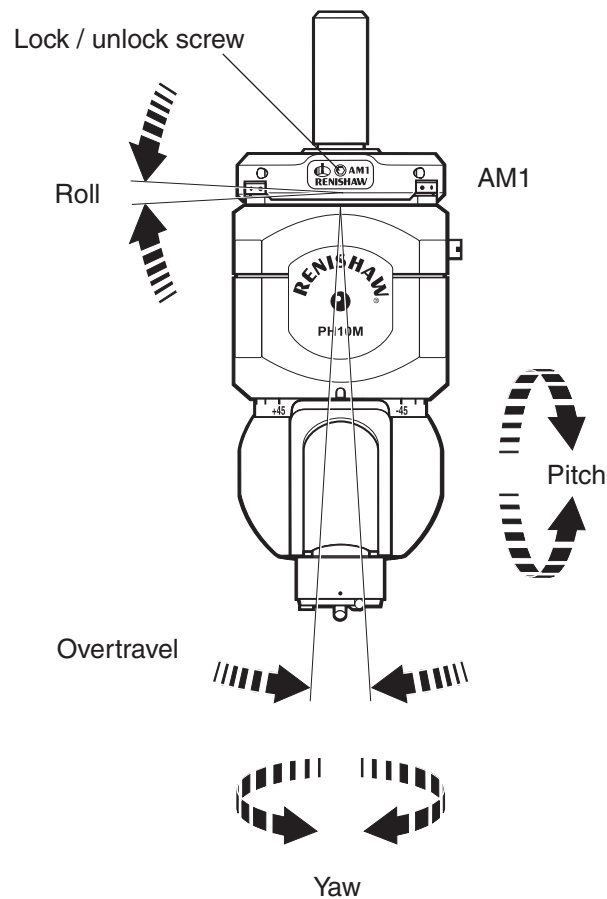


Figure 20 - PH10M fitted with AM1

The AM1 incorporates a bayonet fitting allowing the head to be easily detached from the machine, and to be refitted.

The AM1 offers the capability of limited crash protection by incorporating a nominal $\pm 3.5^\circ$ overtravel facility.

Full details of fitting and adjusting the AM1 are given in the AM1 user's guide (Renishaw part number H-1000-4010).

9.3 AM2 adjustment module

The PH10MQ has been designed to be mounted directly on your machine quill in any orientation.

The AM2 allows fine adjustment in pitch, roll and yaw, enabling the head to be aligned accurately with the machine's axes (see figure 21).

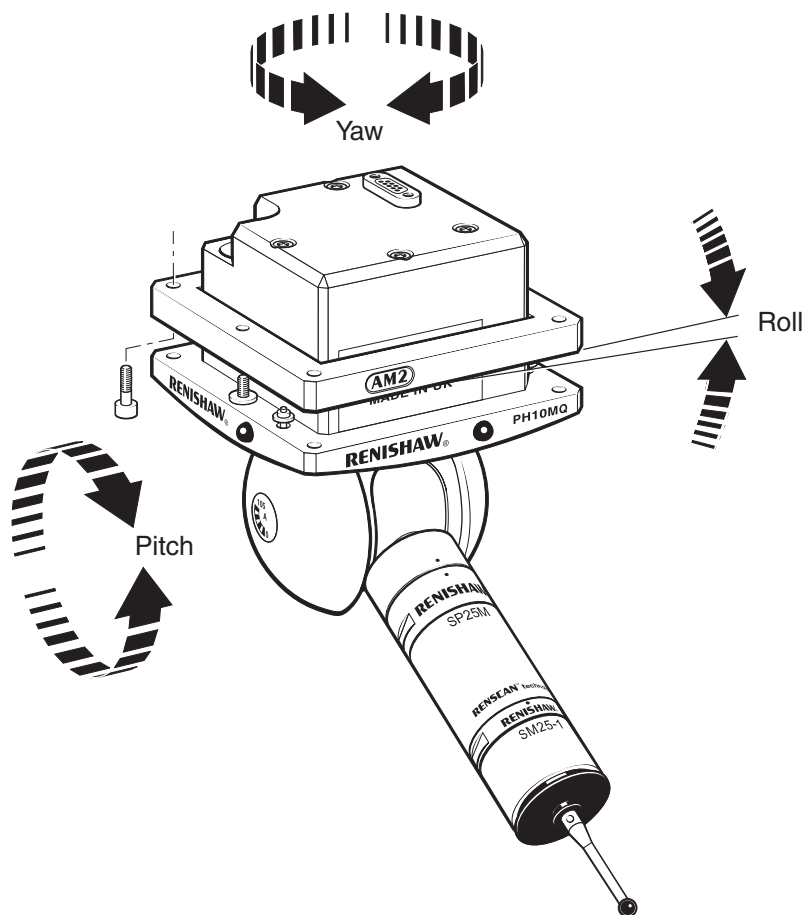


Figure 21 - AM2 adjustment module

The AM2 incorporates a highly repeatable mounting system allowing the head to be easily detached from the machine, and to be refitted.

Full details of fitting and adjusting the AM2 are given in the AM2 new product information sheet (Renishaw part number H-1000-2051).

10 System interconnection diagrams

This section describes a number of PH10 system interconnections and recommends interconnection cables and configuration switch settings.

The recommended configuration switch settings are given in a table below each interconnection diagram. The tables do not include all the configuration switches. Where configuration switches are not specified for the PHC10-2, please refer to sections 4 to 6. For other product configuration switch settings, please refer to the appropriate installation guide.

The interconnection diagrams include:

- The PH10T or PH10M system with standard two-wire touch-trigger probes (see figure 22 and table 21)
- The PH10M system with standard two-wire touch-trigger probes and autochange (see figure 23 and table 22)
- The PH10M system with multiwired probes (see figure 24 and table 23)
- The PH10M system with multiwired probes and autochange (see figure 25 and table 24)

For further information on system interconnection, please contact your nearest Renishaw office.

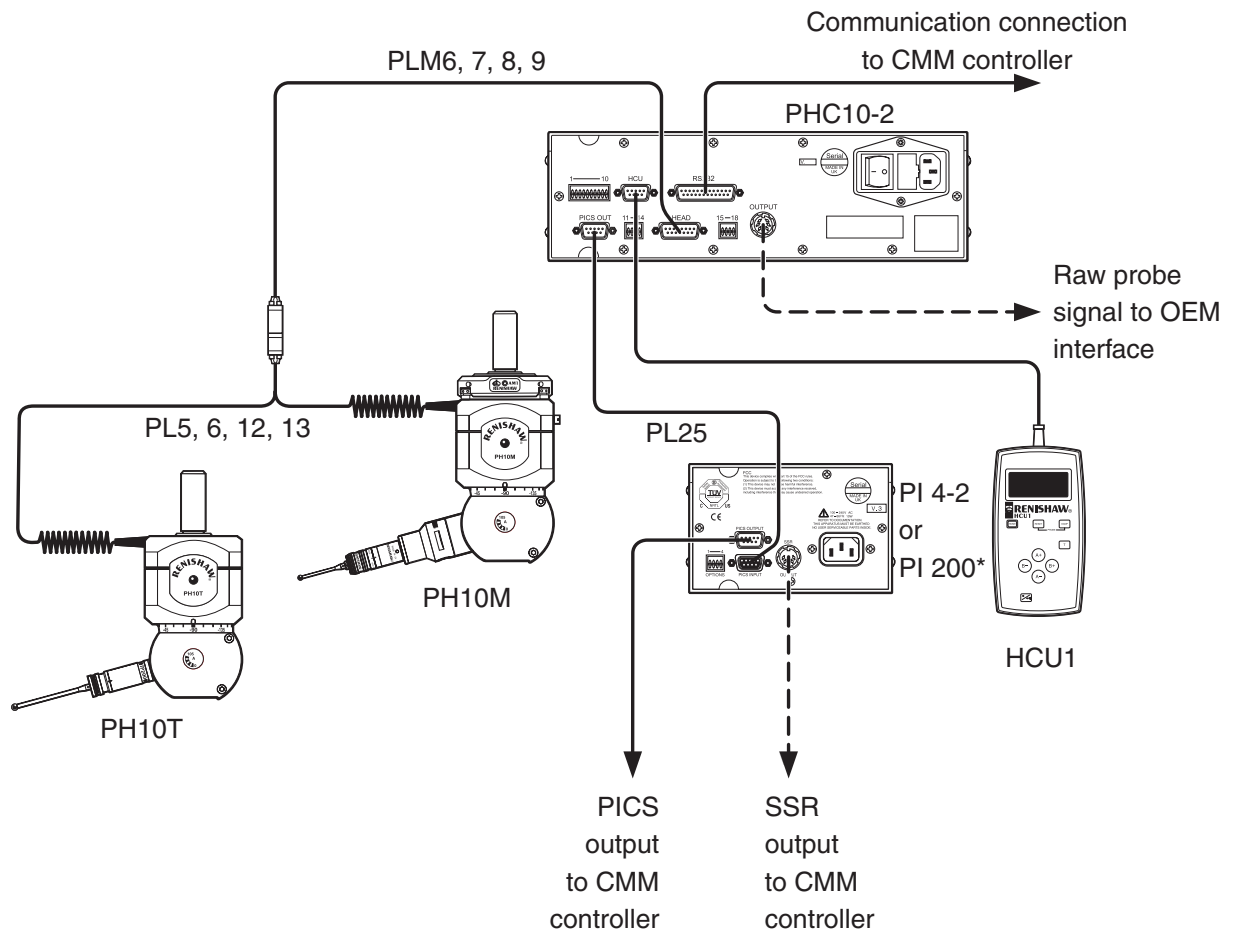


Figure 22 - PH10 system with standard two-wire touch-trigger probes

Table 21 - Switch settings				
	PICS configuration		SSR configuration	
	Up	Down	Up	Down
PHC10-2	11, 15, 16, 17, 18	10, 13, 14	-	10, 13, 14, 15, 16
PI 4-2	3, 4	-	3,4	-
PI 200*	-	10	-	10

* For TP200 systems, the use of the PICS signal probe DAMPING is recommended. Refer to H-1000-5000 PIC'S installation guide for further information.

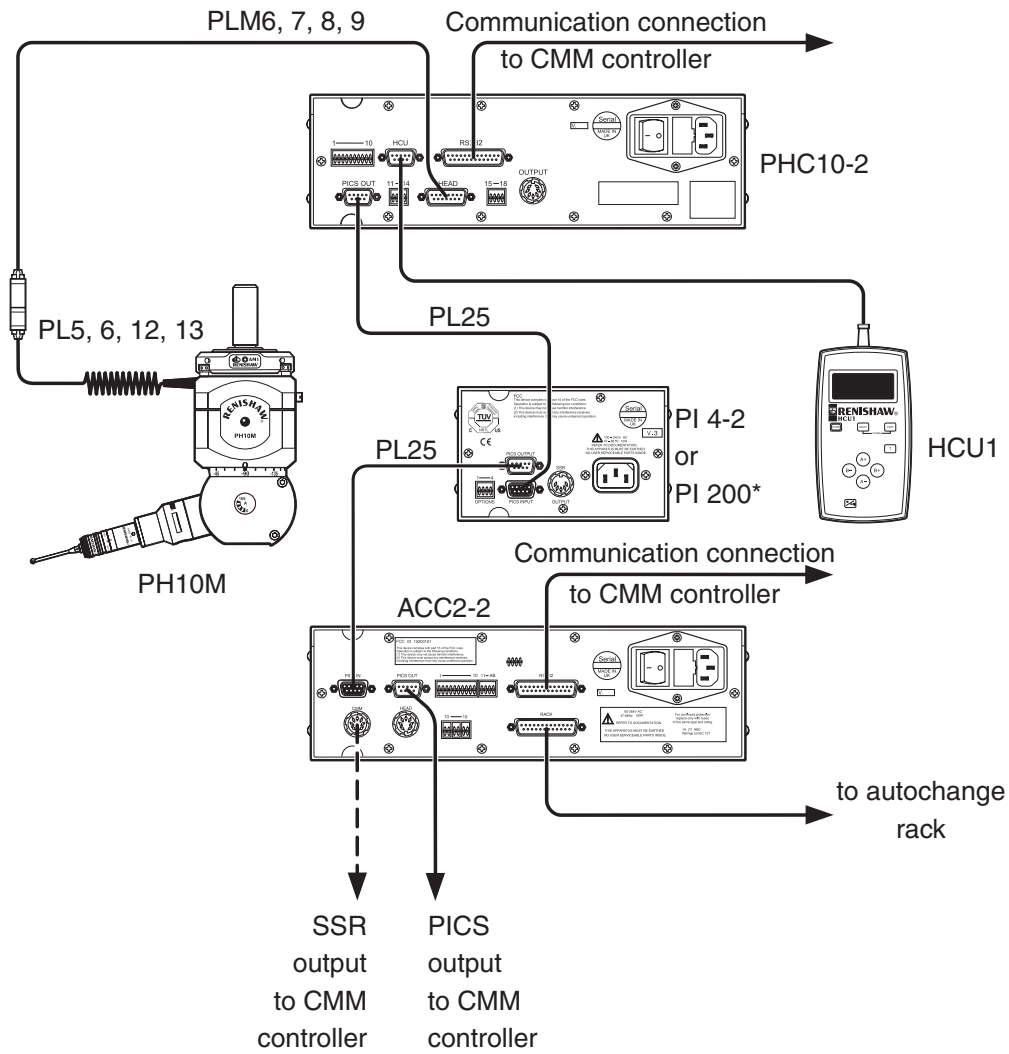


Figure 23 - PH10 system with standard two-wire touch trigger probe and autochange

	PICS configuration		SSR configuration	
	Up	Down	Up	Down
PHC10-2	11, 15, 16, 17, 18	10, 13, 14	-	10, 13, 14, 15, 16
PI 4-2	1, 3, 4	-	1, 3, 4	-
PI 200*	-	10	-	10
ACC2-2	9	A, B	-	9, A, B

* For TP200 systems, the use of the PICS signal probe DAMPING is recommended. Refer to H-1000-5000 PIC'S installation guide for further information.

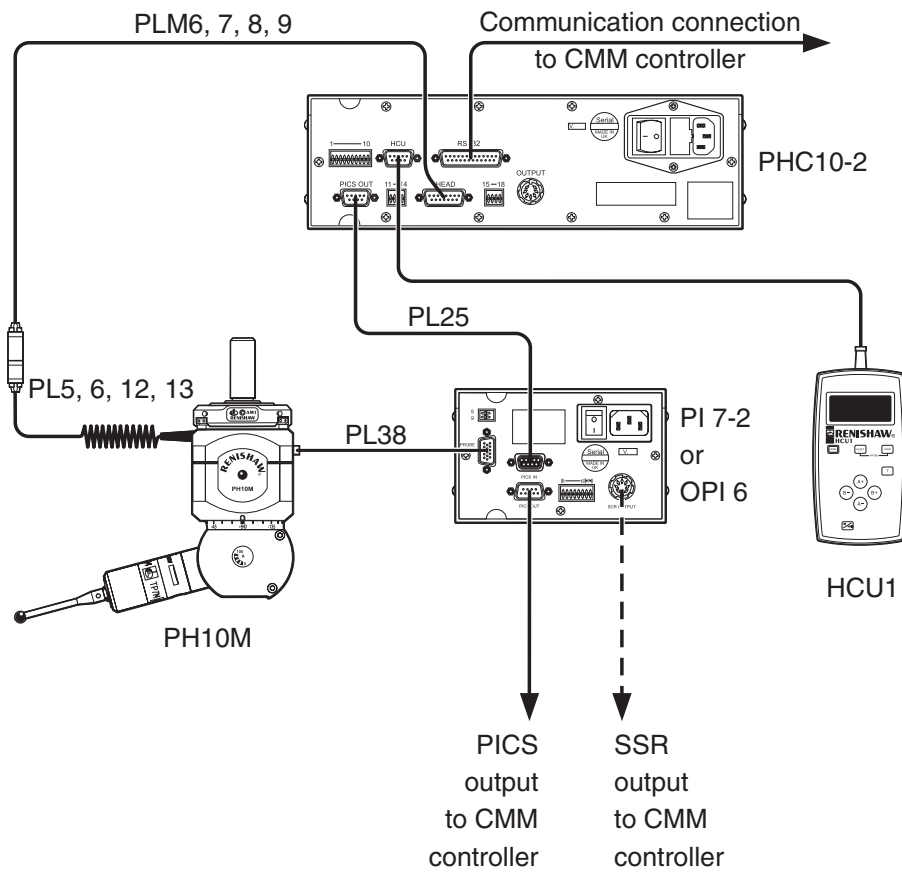


Figure 24 - PH10 system with multiwired probes

Table 23 - Switch settings				
	PICS configuration		SSR configuration	
	Up	Down	Up	Down
PHC10-2	11, 15, 16, 17, 18	10, 13, 14	-	10, 13, 14, 15, 16
PI 7-2	3, 7	6	3, 7	6
OPI 6	-	2,4	-	2,4

For these systems the use of the PICS signal probe DAMPING is recommended. Refer to H-1000-5000 PIC'S installation guide for further information.

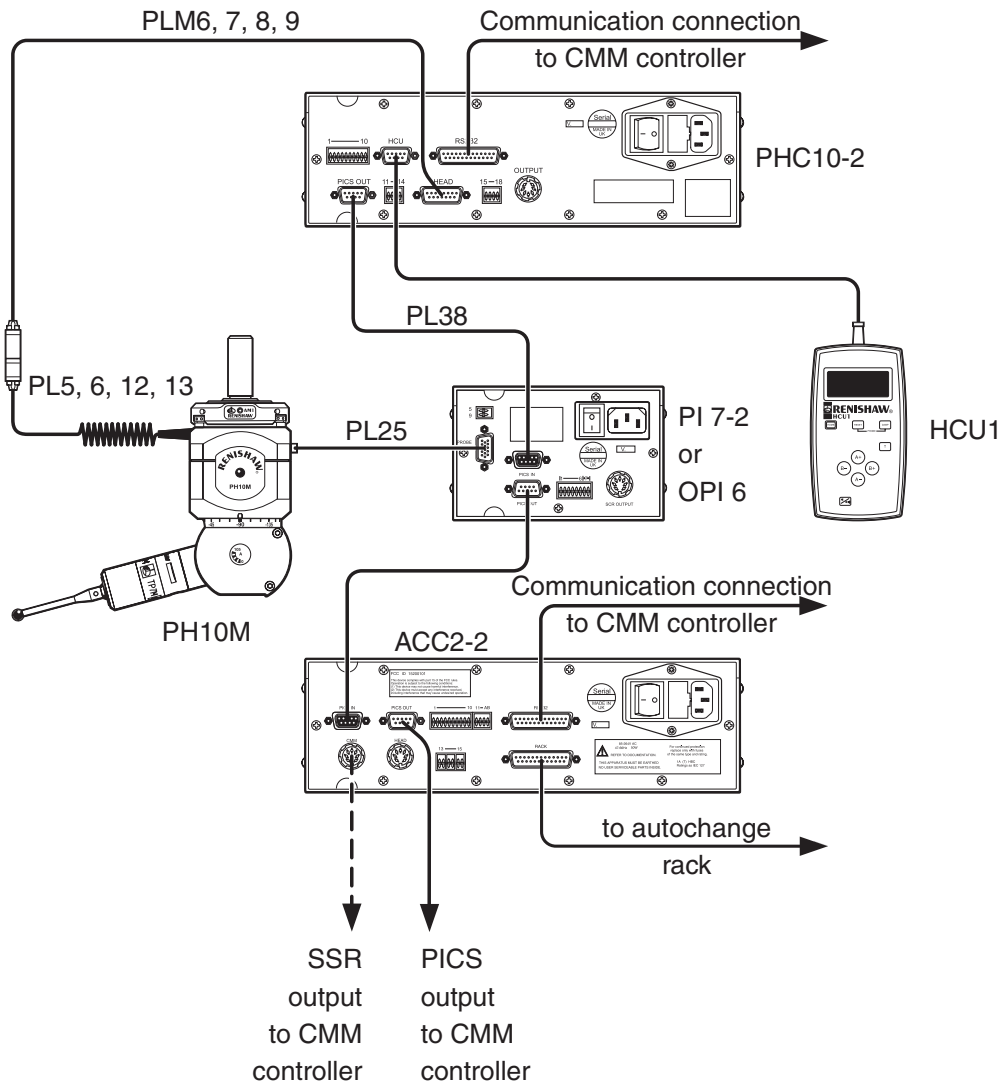


Figure 25 - PH10 system with multiwired probes and autochange

Table 24 - Switch settings				
	PICS configuration		SSR configuration	
	Up	Down	Up	Down
PHC10-2	11, 15, 16, 17, 18	10, 13, 14	-	10, 13, 14, 15, 16
PI 7-2	1, 3, 7	6	1, 3, 7	6
OPI 6	-	2,4	-	2,4
ACC2-2	9	A, B	-	9, A, B

For these systems the use of the PICS signal probe DAMPing is recommended. Refer to H-1000-5000 PIC'S installation guide for further information.

11 Troubleshooting

This section on troubleshooting is a guide to problems associated with the installation and integration of the system only. Section 4 of the PH10 series user's guide (Renishaw part number H-1000-5070) deals with problems associated with normal operation of the system.

The optional HCU1 can also be used to identify system faults. For full details of the use and fault finding capability of the unit see the HCU1 hand control unit user's guide (Renishaw part number H-1000-5016).

Use table 25 to identify problems you are experiencing with your system. If you experience problems which you are not able to identify or solve satisfactorily, please contact Renishaw for further advice.

Table 25 - Troubleshooting		
Observation	Possible cause	Checks / remedies
POWER ON LED not lit.	Power loss.	Check mains cable connections and integrity. Check PHC10-2 fuse (see page 6). Check CMM EMERGENCY STOP condition - power may have been removed by the CMM.
No head movement in automatic mode.	Power loss. Cable/connection fault. Communications failure. Incorrect command set selected.	See above. Check connections and integrity of cabling between head and PHC10-2. Check RS232 baud rate (see section 4.2) or IEEE protocol selection for RS232 (see section 5.3). Check correct command set is selected (see section 4.3.1).
No head movement in manual mode.	Power loss. Cable/connection fault.	See above. Check connections and integrity of cabling between head and PHC10-2.
No output signal received by the CMM computer.	Cable/connection fault. Multiwire bypass connector not fitted. Multiwired probe in use.	Check connections and integrity of cabling from: - head to PHC10-2 - PHC10-2 to interface - interface to CMM computer When using standard touch-trigger probes, the probe head multiwire bypass connector must be fitted to permit the probe signal to reach the PHC10-2. Check that the multiwire cable is correctly fitted to the head. Check that the trigger output to the CMM computer is connected to the multiwired probe interface.
Poor measurement performance.	Loose mounting of head. Probe DAMPing enabled during measurement.	Ensure all mounting screws are tight and mounting to CMM is secure. Ensure probe DAMPing is not enabled during measurement moves.

12 Appendix 1 - International safety statements

BG - Предупреждения

Съществуват рискове от притискане между движещи се части и между движещи се и неподвижни части. Да не се държи пробникът или главата на пробника по време на работните движения, или при ръчна смяна на пробника.

Пазете се от неочаквано движение. Потребителят трябва да остава извън пълния работен обсег на комбинациите глава на пробника / удължител / пробник.

Препоръчва се защита на очите във всички приложения, включващи използване на машини или СММ.

Обикновено в приборите Renishaw с мрежово захранване няма части, които да се обслужват от потребителя. Дефектиралите прибори да се връщат в сервизния център за обслужване на клиенти на Renishaw.

Заменяйте изгорелите предпазители с нови от същия тип. Вж. информацията по безопасност в съответната документация за продукта.

За инструкции по отношение безопасното почистване на продуктите Renishaw вж. информацията за поддръжка в съответната документация на продукта.

Преди извършване на всякакви операции по поддръжката да се изключва захранването.

Вж. инструкциите за работа на доставчика на машината.

Отговорност на доставчика на машината е да гарантира, че на потребителя са обяснени всякакви рискове по време на работа, включително онези, упоменати в документацията на продуктите Renishaw и да гарантира осигуряване на съответни предпазители и обезопасителни блокировки.

При определени обстоятелства сигналът от пробника може да посочва фалшиво състояние на опрян пробник. Да не се разчита на сигналите от пробника за спиране движението на машината.

Очакваният метод за осигуряване на аварийно спиране за продуктите Renishaw е да се изключи захранването.

CS - UPOZORNĚNÍ

Mezi pohyblivými součástmi a mezi pohyblivými a statickými součástmi hrozí nebezpečí přiskřípnutí. Při přesunování nebo ručním nastavování sondy nedržte snímací hlavici.

Dejte pozor na nečekaný pohyb stroje. Uživatel by měl setrvávat mimo pracovní rozsah stroje, zejména mimo místa pohybu snímací hlavice, prodloužení a sondy.

Při jakékoli práci s obráběcími stroji nebo souřadnicovými měřicími stroji (CMM) je doporučeno používat ochranu očí.

Sítově napájené produkty Renishaw obvykle neobsahují žádné části opravitelné uživatelem. Vadné jednotky zašlete do centra autorizovaného servisu společnosti Renishaw.

Pokyny týkající se bezpečného čištění produktů společnosti Renishaw naleznete v části věnované informacím o údržbě v příslušné dokumentaci k produktu.

Před započetím jakékoli údržby zařízení odpojte napájení.

Přečtěte si provozní pokyny dodavatele příslušného stroje.

Povinností dodavatele stroje je informovat uživatele o nebezpečích spojených s provozem i o nebezpečích zmiňovaných v dokumentaci k produktům společnosti Renishaw a zajistit dostatečné ochranné a bezpečnostní systémy.

Za určitých okolností může signál sondy nesprávně označovat klidový stav sondy. Nevyužívejte signály sondy jako hlavní impuls pro zastavování stroje.

Předpokládaným způsobem nouzového zastavení produktů společnosti Renishaw je odpojení napájení.

DA - SIKKEREDHED

Der er risiko for at blive klemt mellem bevægelige dele og mellem bevægelige og statiske dele. Hold ikke sondehovedet under bevægelse eller ved manuelle sondeskift.

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

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

Der er normalt ingen dele inde i Renishaw-enhederne, som sluttes til lysnettet, der kan efterses eller reparerer af brugeren. Send alle defekte enheder til Renishaws kundeservicecenter.

Se under vedligeholdelse i produktdokumentationen for at få instruktioner til sikker rengøring af Renishaw-produkter.

Afbryd strømforsyningen, før der foretages vedligeholdelse.

Se maskinleverandørens brugervejledning

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 produktdokumentation, og at sikre, at der er tilstrækkelig afskærmning af sikkerhedsblokeringer.

Under visse omstændigheder kan sondesignalet ved en fejl angive, at sonden står stille. Stol ikke på, at probesignaler vil stoppe maskinens bevægelse.

Den forventede metode til nødstop af Renishaw-produkter er afbrydelse strømforsyningen.

DE - SICHERHEITSAUWEISUNGEN

Zwischen beweglichen und zwischen beweglichen und statischen Teilen besteht Einklemmgefahr. Der Dreh-/Schwenkkopf darf während des Betriebs oder einem Messtasterwechsel nicht berührt oder festgehalten werden.

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

Bei Arbeiten an Werkzeugmaschinen oder Koordinatenmessgeräten wird Augenschutz empfohlen.

Die mit Netzstrom versorgten Renishaw-Einheiten enthalten im Normalfall keine Bauteile, die durch den Anwender gewartet werden können. Senden Sie defekte Geräte an Ihren Renishaw Kundendienst zurück.

Anleitungen zur sicheren Reinigung von Renishaw-Produkten sind im Kapitel Wartung (MAINTENANCE) in der Produktdokumentation enthalten.

Bevor Wartungsarbeiten begonnen werden, muss die Stromversorgung getrennt werden.

Beachten Sie die Bedienungsanleitungen des Maschinenherstellers.

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 sicherzustellen, dass ausreichende Schutzvorrichtungen und Sicherheitsverriegelungen eingebaut sind.

Es kann passieren, dass der Messtaster fälschlicherweise eine Ruhestellung des Messtasters signalisiert. Verlassen sie sich nicht alleine auf das Messtastersignal, um Maschinenbewegungen zu stoppen.

Renishaw-Produkte im Notfall durch Ausschalten der Stromversorgung stoppen.

EL - ΑΣΦΑΛΕΙΑ

Υπάρχει κίνδυνος πιασίματος μεταξύ των κινούμενων μερών όπως και μεταξύ των κινούμενων και στατικών μερών. Μη συγκρατείτε την κεφαλή ανιχνευτή κατά τη διάρκεια των κινήσεων ούτε και κατά τη διάρκεια χειροκίνητων αλλαγών του ανιχνευτή.

Προσέξτε τις απροσδόκητες κινήσεις. Ο χρήστης πρέπει να παραμένει εκτός του χώρου στον οποίο διεξάγονται όλοι οι συνδυασμοί λειτουργίας της κεφαλής 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.

Στο εσωτερικό μονάδων της Renishaw που συνδέονται με την κεντρική παροχή ρεύματος δεν υπάρχουν εξαρτήματα που χρειάζονται συντήρηση από το χρήστη. Επιστρέψτε τις ελαττωματικές μονάδες σε εξουσιοδοτημένο κέντρο εξυπηρέτησης πελατών της Renishaw.

Για οδηγίες σχετικά με τον ασφαλή καθαρισμό των προϊόντων Renishaw, ανατρέξτε στις πληροφορίες σχετικά με τη συντήρηση του έντυπου συνοδευτικού υλικού του αντίστοιχου προϊόντος.

Αποσυνδέστε το μηχάνημα από το ηλεκτρικό ρεύμα πριν επιχειρήσετε οποιοσδήποτε εργασίες συντήρησης.

Συμβουλευτείτε τις οδηγίες λειτουργίας του προμηθευτή του μηχανήματος.

Αποτελεί ευθύνη του προμηθευτή του μηχανήματος να εξασφαλίσει ότι ο χρήστης είναι ενήμερος για τυχόν κινδύνους που συνεπάγεται η λειτουργία, συμπεριλαμβανομένων όσων αναφέρονται στα εγχειρίδια του προϊόντος της Renishaw. Είναι επίσης ευθύνη του να εξασφαλίσει ότι υπάρχουν τα απαιτούμενα προστατευτικά καλύμματα και οι συνδέσεις ασφαλείας.

Υπό ορισμένες συνθήκες το σήμα του ανιχνευτή μπορεί να υποδεικνύει λανθασμένη ένδειξη τοποθέτησης του ανιχνευτή. Μη βασίζεστε στα σήματα ανιχνευτή για τη διακοπή της κίνησης του μηχανήματος.

Η αναμενόμενη μέθοδος διακοπής έκτακτης ανάγκης για τα προϊόντα Renishaw είναι η αποσύνδεσή τους από το ηλεκτρικό ρεύμα.

ES - SEGURIDAD

Existe el peligro de atraparse los dedos entre las distintas partes móviles y entre partes móviles e inmóviles. No sujetar la cabeza de la sonda mientras se mueve, ni durante los cambios manuales de la sonda.

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 gafas de protección en todas las aplicaciones que implican el uso de máquinas herramientas y máquinas de medición de coordenadas.

Dentro de las unidades Renishaw que se enchufan a la red, normalmente no existen piezas que puedan ser mantenidas por el usuario. Las unidades defectuosas deben ser devueltas a un Centro de Servicio al Cliente Renishaw.

Para instrucciones sobre seguridad a la hora de limpiar los productos Renishaw, remitirse a la sección titulada MANTENIMIENTO (MAINTENANCE) en la documentación sobre el producto.

Quitar la corriente antes de emprender cualquier operación de mantenimiento.

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

Es responsabilidad del proveedor de la máquina asegurar que el usuario sea informado sobre los peligros relacionados con el funcionamiento, incluidos los peligros mencionados en la documentación de los productos Renishaw, y asegurar que se suministran los dispositivos de protección y 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.

El método previsto para efectuar una parada de emergencia de los productos Renishaw es el de quitar la corriente.

ET - HOIATUSED

Masina liikuvad osad võivad põhjustada muljumisohtu. Ärge hoidke masina liikumise ajal või sondi vahetamise ajal kinni sondipeast.

Arvestage masina ootamatu liikumisega. Kasutaja peab jääma väljapoole sondipea ja sondipikendi tööulatust.

Masina ja materjalidega töötamisel on alati soovitatav kanda silmade kaitset.

Vooluvõrgus töötavates Renishaw masinates ei ole reeglina selliseid detaile, mida kasutaja peaks ise hooldama. Tagastage vigased seadmed volitatud Renishaw klienditeeninduskeskusse.

Täpsemad juhised Renishaw toodete ohutuks puhastamiseks leiate vastava toote dokumentide hooldusjuhiste alaosast.

Enne hooldustoimingute teostamist ühendage seade alati vooluvõrgust lahti.

Täpsemad juhised leiate masina tarnija poolt antud kasutusjuhendist.

Masina tarnija vastutuseks on tagada, et kasutajat teavitatakse masina tööga kaasnevatest ohtudest, kaasa arvatud need ohud, mida on mainitud Renishaw toote dokumentides, ning samuti tagada, et masinaga oleks kaasas korrektsed kaitsepiirded ja turvalukud.

Teatud tingimustel võib sondi signaal ekslikult näidata, nagu oleks sond paigale asetunud. Ärge lähtuge masina liikumise peatamisel sondi signaalidest.

Esmaseks masina hädaseiskamise meetodiks Renishaw toodete puhul on elektritoite katkestamine.

FI - TURVALLISUUTTA

Liikkuvien osien sekä liikkuvien ja staattisten osien välillä on olemassa puristusvaara. Älä pidä kiinni anturin päästä sen liikkeessä tai vaihtaessasi anturia käsin.

Varo odottamatonta liikettä. Käyttäjän tulee pysyä mittapää/jatke/anturi-yhdistelmien toiminta-alueen ulkopuolella.

Silmäsuojainten käyttö on suositeltavaa kaikkia työstökoneita ja koordinaattimittauskoneita (CMM) käytettäessä.

Sähköverkkoon kytkettävät Renishaw-tuotteet eivät tavallisesti sisällä käyttäjän huollettavissa olevia osia. Vialliset osat tulee palauttaa valtuutetulle Renishaw-asiakaspalvelukeskukselle

Katso ohjeet Renishaw'n tuotteiden turvallisesta puhdistamisesta kyseisen tuotteen tuoteselosteen huolto-ohjeista.

Katkaise virta ennen huoltotoimenpiteiden suorittamista.

Katso koneen toimittajan käyttöohjeita.

Koneen toimittajan vastuulla on, että käyttäjä on saanut tiedon mahdollisista käyttöön liittyvistä vaaroista mukaan lukien Renishaw'n tuoteselosteessa mainitut vaarat. Konetoimittajan tulee myös varmistaa, että suojuukset ja turvalukitukset ovat riittävät.

Tietyissä olosuhteissa anturilta tuleva signaali saattaa virheellisesti osoittaa, että mitta-anturi on lepotilassa (=ei-kosketuksessa). Älä pysäytä koneen liikettä mittapään signaalien perusteella.

Renishaw-tuotteiden hätäpysäytys tehdään tavallisesti kytkemällä virta pois päältä.

FR - SECURITE

L'effet de pincement dû au mouvement des pièces mobiles entre elles ou avec des pièces fixes présente des dangers. Ne pas tenir la tête du palpeur lorsqu'elle se déplace ou que le palpeur est changé à la main.

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 MMC.

Normalement, aucune pièce des produits Renishaw alimentées sur secteur ne peut être réparée par l'utilisateur. Renvoyer tout matériel défectueux à un Centre Après Vente Renishaw agréé.

Les conseils de nettoyage en toute sécurité des produits Renishaw figurent dans les consignes de maintenance de votre documentation.

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

Consulter le mode d'emploi 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 du palpeur indique à tort l'état que le palpeur est au repos. Ne pas se fier aux signaux du capteur qui ne garantissent pas toujours l'arrêt de la machine.

La procédure habituelle d'arrêt d'urgence des produits Renishaw est la mise hors tension.

Éire - Foláirimh

Tá guaiseacha cúngúcháin ann idir páirteanna atá ag gluaiseacht agus idir páirteanna atá ag gluaiseacht agus páirteanna statacha. Ná coinnigh greim ar cheann an tóireadóra le linn gluaiseachtaí, nó nuair atá tóireadóir á athrú de lámh.

Fainic an chorraíl gan choinne. Ba chóir don úsáideoir fanacht lasmuigh d'ímchlúdach iomlán oibre an chinn tóireadóra/bhreisithe/na dteaghlaimí tóireadóra.

Moltar cosaint do na súile i ngach aon fheidhmiú lena mbaineann úsáid uirlisí meaisín nó CMM.

Maidir le haonaid Renishaw a fhaigheann cumhacht ón bpríomhlíne, is iondúil nach mbíonn aon chodanna laistigh díobh a d'fhéadfadh an t-úsáideoir a shocrú. Seoltar aonaid fhabhtacha ar ais chuig Ionad údaraithe Renishaw um Sheirbhís do Chustaiméirí.

Atsholáthair fiúsanna séidte le comhpháirteanna den chineál céanna. Tagair don fhaisnéis shábhailteachta i gcáipéisíocht ábhartha an táirge.

Féach an fhaisnéis chothabhála sa cháipéisíocht a théann leis an táirge bainteach chun treoracha a fháil faoi tháirgí Renishaw a ghlanadh go sábháilte.

Baintear an chumhacht de sula ndéantar aon oibríochtaí cothabhála.

Féach na treoracha oibriúcháin ó sholáthraí an mheaisín.

Tá sé de dhualgas ar sholáthraí an mheaisín a chinntiú go dtugtar le fios don úsáideoir na guaiseacha a bhaineann leis an oibriú, lena n-áirítear iad sin a luaitear i gcáipéisíocht Renishaw faoina dtáirgí féin, agus a chinntiú go soláthraítear comhghlasáil agus cibé cosaint leordhóthanach eile atá riachtanach.

D'fhéadfadh an tóireadóir comhartha a thabhairt, ar chúinsí áirithe, go raibh rud éigin cearr leis go bréagach. Ná braithe ar chomharthaí tóireadóra le gluaiseacht an mheaisín a stopadh.

Is é an modh a bhítear ag dúil le stop éigeandála a sholáthar do tháirgí Renishaw ná an chumhacht a bhaint díobh.

HU - FIGYELMEZTETÉS

Fennáll a veszélye, hogy a keze beszorulhat mozgó alkatrészek valamint mozgó és álló alkatrészek közé. Mozgás közben, vagy a mérőtapintó kézi cserélésekor ne fogja meg a tapintófejet.

Vigyázat! A gép váratlanul elindulhat! Tartózkodjon a tapintófej/hosszabbító/mérőtapintó együttes mozgáskörzetén kívül!

Szerszámgépek és KMG-ek használata során ajánlatos szemvédőt viselni.

A Renishaw hálózati egységeiben általában nincsenek a felhasználó által javítható alkatrészek. A meghibásodott egységeket juttassa el valamelyik hivatalos Renishaw Vevőszolgálati Központhoz.

A Renishaw termékek biztonságos tisztításával kapcsolatos útmutatások az illető termék dokumentációjában szereplő karbantartási tudnivalóknál olvashatók.

Mielőtt bármilyen karbantartási művelet végezne, kapcsolja ki a berendezést.

Olvassa el a gép szállítója által adott használati utasítás ide vonatkozó részét.

A gép szállítója felelős azért, hogy felhívja a felhasználó figyelmét az üzemeltetéssel kapcsolatos veszélyforrásokra, ideértve az illető Renishaw termék dokumentációjában ismertetetteket is, és hogy gondoskodjon a megfelelő védőburkolatok és biztonsági reteszelések meglétéről.

Bizonyos körülmények között a mérőtapintó azt jelezheti, hogy a mérőtapintó felfeküdt a mérendő objektumon, noha ez nincs így. Ezért a gép mozgásának leállításakor nem szabad a mérőtapintó jeleire hagyatkozni.

A Renishaw termékek vészleállításának elvárt módszere a berendezés kikapcsolása.

IT - SICUREZZA

Esiste pericolo di danno da schiacciamento tra le parti in moto o tra le parti in moto e quelle ferme. Evitare di afferrare la testina della sonda quando è in moto, oppure quando la sonda viene cambiata manualmente

Fare attenzione ai movimenti improvvisi. Si raccomanda all'utente di tenersi al di fuori dello spazio operativo della testa della sonda, delle prolunghie 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.

Di solito, gli apparecchi Renishaw alimentati da rete elettrica non contengono componenti su cui si possano eseguire interventi di manutenzione da parte dell'utente. In caso di guasto, rendere l'apparecchio a uno dei Centri di Assistenza Renishaw

Per le istruzioni relative alla pulizia dei prodotti Renishaw, fare riferimento alle informazioni sulla manutenzione della documentazione del prodotto.

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

Consultare le istruzioni d'uso fornite dal 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 fornire ripari di sicurezza e interruttori di esclusione adeguati.

È possibile che in certe situazioni venga erroneamente prodotto un segnale che indica che la sonda è in posizione. Evitare di fare affidamento sugli impulsi trasmessi dalla sonda per arrestare la macchina.

Il metodo corretto di eseguire un arresto di emergenza per i prodotti Renishaw è l'interruzione dell'alimentazione elettrica.

LT - ĮSPĖJIMAI

Tarp judančių detalių bei tarp judančių ir statišų detalių pakliuvę daiktai gali būti suspausti. Nelaikykite zondo galvutės veikiant įrenginiui ar keisdami zondą rankiniu būdu.

Saugokitės netikėtų judesių. Naudotojui nerekomenduojama atidaryti veikiančios zondo galvutės / ilgintuvo / zondų junginio gaubto.

Dirbant visus darbus, naudojant įrenginio įrankius ar valant ir prižiūrint įrenginį, rekomenduojama užsidėti apsauginius akinius.

Paprastai Renishaw prietaisuose, maitinamuose iš elektros tinklo, nėra detalių, kurias galėtų remontuoti pats naudotojas. Gražinkite sugedusius prietaisus Renishaw klientų aptarnavimo centrui.

Nurodymų dėl saugaus Renishaw prietaisų valymo ieškokite atitinkamo prietaiso techninėje dokumentacijoje apie priežiūrą.

Prieš atlikdami techninę priežiūrą, išjunkite elektros srovės tiekimą.

Laikykitės įrenginio tiekėjo naudojimo nurodymų.

Įrenginio tiekėjas atsako už tai, kad naudotojas būtų įspėtas apie pavojus, susijusius su įrenginio naudojimu, taip pat pavojus, minimus Renishaw prietaiso techninėje dokumentacijoje, ir kad būtų sumontuoti atitinkami apsauginiai įrenginiai bei blokatoriai.

Susiklosčius tam tikroms aplinkybėms, zondo signalas gali neteisingai informuoti, kad jo reikšmės nustatytos į pradinę būseną. Nepasikliaukite zondo signalais ir iš karto nestabdykite įrenginio.

Tinkamiausias būdas sustabdyti Renishaw prietaisą yra nutraukti elektros srovės tiekimą.

LV - BRĪDINĀJUMS

Starp kustīgajām daļām, kā arī kustīgajām un nekustīgajām daļām iespējams saspiešanas risks. Nepieskarieties ar rokām tausta uzglim kustības laikā vai mainot taustu.

Uzmanieties no negaidītas kustības. Lietotājam jāpaliek ārpus tausta/uzgaļa/kontaktmērgalviņas pilna darbības rādiusa.

Pie visiem darbiem, kuros tiek izmantotas darba iekārtas vai koordinātu mērīšanas ierīces, ieteicams aizsargāt acis.

Parasti Renishaw strāvai pievienotajās ierīcēs nav daļu, kuras apkalpo lietotājs. Nosūtiet bojātās ierīces atpakaļ uz pilnvarotu Renishaw klientu apkalpošanas centru.

Instrukcijas drošai Renishaw izstrādājumu tīrīšanai ir iekļautas apkalpošanas informācijā atbilstošā izstrādājuma dokumentācijā.

Atvienojiet no strāvas pirms jebkuru apkalpošanas darbu veikšanas.

Skatiet iekārtas piegādātāja ekspluatācijas instrukcijas.

Iekārtas piegādātājs atbild par to, lai lietotājs būtu iepazīstināts ar jebkuriem draudiem, kas saistīti ar tās darbību (ieskaitot tos, kas minēti Renishaw izstrādājuma dokumentācijā), un lai būtu nodrošinātas atbilstošas aizsargierīces un aizsargbloķētāji.

Noteiktos apstākļos tausta signāls var nepareizi norādīt tausta stāvokli. Nepaļaujieties uz tausta signālu, lai apturētu iekārtas kustību.

Tiek pieņemts, ka Renishaw izstrādājumu avārijas apturēšanai lietotājs to atvienos no strāvas.

MT - TWISSIJET

Hemm il-periklu li wieħed jinqaras bejn biċċiet li jiċċaqilqu u bejn biċċiet li jiċċaqilqu u biċċiet statiči. Iżżommx ir-ras tas-sonda waqt movimenti, jew meta tkun qiegħed/qegħda tbiddel sonda.

Oqgħod attent(a) għal moviment mhux mistenni. L-utent għandu jibqa' barra l-envelopp ta' tħaddim sħiħ tal-kombinazzjonijiet tar-ras tas-sonda/estensjoni/sonda.

Fl-applikazzjonijiet kollha li jinvolvu l-użu ta' għodda tal-makni jew CMMs, il-protezzjoni ta' l-għajnejn hija rrakkommandata.

Normalment ma hemm ebda biċċiet li jistgħu jiġu mogħtija servis mill-utent ġewwa l-unitajiet mħaddma bl-elettriku ta' Renishaw. Irritorna unitajiet difettużi lil Ċentru Li Jaqdi l-Ħtiġijiet tal-Klijenti ta' Renishaw awtorizzat.

Għal struzzjonijiet dwar it-tindif bla periklu tal-prodotti ta' Renishaw, irreferi għall- informazzjoni tal-manutenzjoni fid-dokumentazzjoni tal-prodott relevanti.

Itfi d-dawl qabel tibda tagħmel xi xogħol ta' manutenzjoni.

Irreferi għall-istruzzjonijiet ta' tħaddim tal-fornitur tal-makna.

Hija r-responsabbiltà tal-fornitur tal-makna li jiżgura li l-utent ikun magħmul konxju ta' kwalunkwe perikli involuti fit-tħaddim, inklużi dawk imsemmija fid-dokumentazzjoni tal-prodott ta' Renishaw, u li jiżgura li hemm provdut l-ilqugħ u l-interlocks ta' sigurtà adegwati.

Taħt ċerti ċirkostanzi s-sinjali tas-sonda jista' b'mod falz jindika kundizzjoni ta' sonda mhux attiva. Tiddependix fuq sinjali tas-sonda sabiex twaqqaf il-moviment tal-makna.

Il-metodu mistenni ta' li jiġi provdut waqfien ta' emergenza għal prodotti ta' Renishaw huwa li jintefa' d-dawl.

NL - VELIGHEID

Er is risico op inklemming tussen de bewegende onderdelen onderling en tussen bewegende en niet-bewegende onderdelen. Houd de tasterkop niet vast als de machine in werking is of bij het handmatig verwisselen van een taster.

Pas op voor onverwachte bewegingen. De gebruiker dient buiten het bereik van de werkende tasterkop/verlengstuk/taster combinaties te blijven.

Voor alle toepassingen, waarbij machinewerktuigen (machinegereedschappen) of CMM's worden gebruikt, wordt het dragen van een veiligheidsbril aanbevolen.

De onderdelen van Renishaw units met netvoeding kunnen meestal niet door de gebruiker worden onderhouden of gerepareerd. Stuur defecte units terug naar een van Renishaw's klantenservicecentra.

Voor het veilig reinigen van Renishaw producten wordt verwezen naar de onderhoudsinstructies in de bijbehorende productdocumentatie.

Schakel de stroom uit, voordat u onderhoudwerkzaamheden verricht.

Raadpleeg de bedieningshandleiding van de machine leverancier.

De leverancier van de machine dient te zorgen dat de gebruiker op de hoogte is van de risico's die zijn verbonden aan het gebruik van de machine, met inbegrip van de risico's vermeld in de productdocumentatie van Renishaw, en dat de machine is voorzien van voldoende beveiligingen en veiligheidsvergrendelingen.

Onder bepaalde omstandigheden kan het tastersignaal een onjuiste tastertoestand aangeven. Vertrouw niet op de tastersignalen om de machine tot stilstand te brengen.

U kunt in geval van nood de Renishaw apparatuur stopzetten door de stroom uit te schakelen.

PL - BEZPIECZEŃSTWO

Występuje niebezpieczeństwo zakleszczenia pomiędzy częściami ruchomymi oraz częściami ruchomymi i nieruchomymi. Nie wolno trzymać głowicy sondy podczas wykonywania przemieszczeń ani podczas ręcznej zmiany sondy.

Należy wystrzegać się nieskoordynowanych ruchów. Użytkownik powinien pozostawać poza pełnym zasięgiem roboczym zespołu głowica sondy/łącznik przedłużający/sonda.

Podczas obsługi obrabiarek lub maszyn współrzędnościowych zaleca się używanie osłon na oczy.

Zazwyczaj wewnątrz zespołów Renishaw zasilanych z sieci elektrycznej nie ma części podlegających obsłudze wykonywanej przez użytkownika. Niesprawne zespoły należy przekazywać do autoryzowanego centrum serwisowego firmy Renishaw.

Aby uzyskać instrukcje dotyczące bezpiecznego wykonywania czyszczenia produktów Renishaw, należy zapoznać się z informacjami dotyczącymi konserwacji w dokumentacji odpowiedniego produktu.

Przed przystąpieniem do jakichkolwiek czynności konserwacyjnych należy odłączyć zasilanie energią elektryczną.

Zapoznać się z instrukcjami obsługi dostarczonymi przez dostawcę urządzeń.

Na dostawcy obrabiarki spoczywa odpowiedzialność za uprzedzenie użytkownika o wszelkich zagrożeniach związanych z eksploatacją łącznie z tymi, o jakich wspomina się w dokumentacji produktu Renishaw oraz za zapewnienie stosownych osłon i blokad zabezpieczających.

W określonych warunkach sygnał sondy może fałszywie wskazywać stan gotowości sondy. Nie należy zatrzymywać pracy maszyny tylko z powodu fałszywego sygnału sondy.

Zalecaną metodą zapewnienia awaryjnego zatrzymania działania produktów firmy Renishaw jest odłączenie zasilania energią elektryczną.

PT - SEGURANÇA

Existe perigo de esmagamento entre as peças móveis/estáticas do equipamento. Não segurar no cabeçote apalpador durante os movimentos ou durante a mudança manual do apalpador.

Tenha em atenção os movimentos inesperados. O utilizador deve permanecer fora da área de trabalho das combinações do cabeçote/extensão/apalpador.

Em todas as aplicações que envolvam a utilização de Máquinas-Ferramenta e CMMs, recomenda-se a utilização protecção para os olhos.

Normalmente, não existem peças que possam ser reparadas pelo usuário dentro dos equipamentos Renishaw. Devolver as unidades defeituosas a um Centro Autorizado de Atendimento a Clientes Renishaw.

Para instruções relativas à limpeza dos produtos Renishaw em segurança, consultar a secção MAINTENANCE (MANUTENÇÃO) da documentação do produto.

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

Consultar as instruções de funcionamento do fornecedor da máquina

É da responsabilidade do fornecedor da máquina garantir que o operador esteja consciente dos perigos envolvidos na operação, incluindo os mencionados na documentação dos produtos da Renishaw, e garantir o fornecimento de bloqueios de segurança e proteções adequadas.

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

O método sugerido para uma parada de emergência de produtos Renishaw é desligar a alimentação de energia.

RO - ATENȚIE

Există riscul prinderii pielii atât între piesele în mișcare cât și între piesele în mișcare și cele fixe. Nu țineți de capul palpatorului în timpul deplasării acestuia sau în timpul schimbării manuale a palpatorului propriu-zis.

Atenție la deplasările neașteptate. Operatorul trebuie să rămână complet în afara zonei de acțiune a ansamblului cap palpator/prelungitor/palpator propriu-zis.

În toate aplicațiile care presupun utilizarea mașinilor unelte sau a MMC, se recomandă protejarea ochilor.

Nu există elemente care pot fi reparate de utilizator în interiorul surselor de alimentare Renishaw. Sursele defecte trebuie transmise Centrului de Service Renishaw pentru Clienți.

Înlocuiți siguranțele arse numai cu componente noi de aceeași valoare. Vezi capitolul SIGURANȚĂ al documentației fiecărui produs implicat.

Pentru instrucțiuni referitoare la curățirea în siguranță a produselor Renishaw, vezi capitolul Întreținere al documentației fiecărui produs implicat.

Înainte de executarea oricăror operații de întreținere, scoateți echipamentul de sub tensiune.

Vezi și instrucțiunile de operare ale furnizorului echipamentului.

Este responsabilitatea furnizorului să se asigure că utilizatorul a fost înștiințat asupra oricărui pericol implicat de utilizarea echipamentului, inclusiv asupra pericolelor menționate în documentația produsului Renishaw, și de asemenea să se asigure că au fost prevăzute protecții și interblocări adecvate.

În anumite circumstanțe, palpatorul poate indica o atingere, în mod eronat. Nu vă bazați pe semnalele primite de la palpator pentru a opri deplasarea mașinii. Metoda indicată pentru o oprire de urgență a unui produs Renishaw este scoaterea de sub tensiune.

SK - VÝSTRAHY

Medzi pohyblivými časťami a medzi pohyblivými a statickými časťami vzniká riziko pomliaždenia. Snímaciu hlavicu počas pohybu alebo pri ručnej výmene sondy nechytajte.

Dávajte si pozor na neočakávaný pohyb. Používateľ by mal zostať mimo celej pracovnej dráhy zostavy snímačej hlavice, ramena a sondy.

Vo všetkých aplikáciách zahŕňajúcich používanie obrábacích strojov alebo súradnicových meracích prístrojov sa odporúča ochrana očí.

Vo vnútri zariadení Renishaw napájaných zo siete nie sú zvyčajne žiadne súčasti, ktoré by mohol opraviť používateľ. Vadné zariadenia vráťte do autorizovaného strediska služieb zákazníckom spoločnosti Renishaw.

Pokyny týkajúce sa bezpečného čistenia produktov spoločnosti Renishaw získate v informáciách o údržbe uvedených v dokumentácii príslušnému produktu.

Pred každým vykonávaním údržby odpojte napájanie.

Pozrite si prevádzkové pokyny dodávateľa stroja.

Zodpovednosťou dodávateľa stroja je zaručiť oboznámenie používateľa so všetkými rizikami súvisiacimi s prevádzkou, vrátane tých, ktoré sú uvedené v dokumentácii k produktu spoločnosti Renishaw, a zaručiť poskytnutie adekvátnych zábran a bezpečnostných blokování.

Signál sondy môže za určitých okolností nesprávne indikovať parkovaciú polohu sondy. Pri zastavovaní pohybov stroja sa nespoliehajte na signály sondy.

Predpokladaný spôsob núdzového zastavenia zariadení spoločnosti Renishaw spočíva v odpojení napájania.

SL - OPOZORILA

Pazite, da se ne uscipnete med gibajocimi deli ter med gibajocimi in staticnimi deli. Ne drzite glave sonde med premiki ali med rocno zamenjavo sonde.

Bodite pozorni na nepricakovane premike. Uporabnik naj se zadrzuje zunaj delovnega obmocja kombinacij glava sonde/podaljsek/sonda.

Pri vseh vrstah uporabe strojnih orodij ali KMM se priporoca uporaba zascite za oci.

Navadno v Renishaw-ovih enotah, napajanih iz omrezja, ni delov, ki bi jih lahko uporabnik servisiral sam. Okvarjene enote vrnite v pooblascen Renishaw-ov servisni center.

Za navodila glede varnega ciscenja Renishaw-ovih izdelkov glejte informacije o vzdrzevanju v ustrezni produktni dokumentaciji.

Pred kakrsnimkoli vzdrzevanjem odklopite napajanje.

Glejte navodila za upravljanje dobavitelja stroja.

Odgovornost dobavitelja stroja je, da uporabnika opozori na vse nevarnosti, ki nastopajo med delovanjem, vkljucno s tistimi, ki so omenjene v Renishaw-ovi produktni dokumentaciji, in da zagotovi, da so dobavljene vse potrebne zascite in varnostne zapore.

Pod določenimi pogoji lahko signal sonde napacno nakazuje, da je sonda v lezecem polozaju. Ne zanasajte se na signale sonde za ustavitev premikanja stroja.

Pricakovana metoda za zaustavitev v sili za Renishaw-ove izdelke je odvzem napajanja.

SV - SÄKERHETSFÖRESKRIFTER

Det finns risk för klämning mellan rörliga delar och mellan rörliga och stillastående delar. Håll inte i probhuvudet under rörelse eller vid manuellt probbyte.

Se upp för plötsliga rörelser. Operatören ska hålla sig utanför arbetsområdet för probhuvud/förlängning/probkombinationer.

Ögonskydd rekommenderas för alla tillämpningar, där verktygsmaskiner eller koordinatmätmaskiner används.

Det finns vanligen inga delar som användaren kan utföra underhåll på inuti Renishaws nätströmsdrivna enheter. Returnera defekta delar till ett auktoriserat Renishaw kundcenter.

Anvisningar för säker rengöring av Renishaws produkter finns i underhållsavsnittet i produktdokumentationen.

Koppla bort strömmen innan underhåll utförs.

Se maskintillverkarens bruksanvisning.

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

Under vissa omständigheter kan probsignalen felaktigt ange att en prob är monterad. Lita inte på probsignaler för att stoppa maskinens rörelse.

Metoden för nödstopp för Renishaws produkter förutsätter att strömmen kopplas bort.

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

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

RENISHAW 
apply innovation™

**For worldwide contact details,
please visit our main website at
www.renishaw.com/contact**



H - 1000 - 5071 - 09