

# PHC10-3 PLUS installation guide

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# PHC10-3 PLUS installation guide

Document part number: H-1000-0077-05-A



## PHC10-3 PLUS installation guide

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# PHC10-3 PLUS general information

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 ORIGINAL LANGUAGE VERSION

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## WEEE



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

## Warranty

Unless you and Renishaw have agreed and signed a separate written agreement, the equipment and/or software are sold subject to the Renishaw Standard Terms and Conditions supplied with such equipment and/or software, or available on request from your local Renishaw office.

Renishaw warrants its equipment and software for a limited period (as set out in the Standard Terms and Conditions), provided that they are installed and used exactly as defined in associated Renishaw documentation. You should consult these Standard Terms and Conditions to find out the full details of your warranty.

Equipment and/or software purchased by you from a third-party supplier is subject to separate terms and conditions supplied with such equipment and/or software. You should contact your third-party supplier for details.

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### Care of equipment

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

### Changes to Renishaw products

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

### Company registration details

Renishaw plc. Registered in England and Wales. Company no: 1106260. Registered office: New Mills, Wotton-under-Edge, Gloucestershire, GL12 8JR, UK.

### Packaging

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

Packaging component	Material	94/62/EC code	94/62/EC number
Outer box	Corrugated fibreboard	PAP	20
Packing foam	Cross-linked polyethylene	LDPE	4
Bag	Low density polyethylene	LDPE	4

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# PHC10-3 PLUS product compliance

## EU declaration of conformity

Contact Renishaw plc or visit [www.renishaw.com/EUCMM](http://www.renishaw.com/EUCMM) for the full EU declaration.

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## AU declaration of conformity

Contact Renishaw plc or visit [www.renishaw.com/AUCMM](http://www.renishaw.com/AUCMM) for the full AU declaration.



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### EMC conformity

This equipment must be installed and used in accordance with this installation guide. This product is intended for industrial use only and should not be used in a residential area or connected to a low voltage power supply network which supplies buildings used for residential purposes.

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### FCC (USA only)

#### Information to user (47 CFR 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.

#### Information to user (47 CFR 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.

#### Equipment label (47 CFR 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.
- 

### ICES-003 (Canada only)

Class A Equipment Statement (non-residential)

CAN ICES-003(A) / NMB-003(A)

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### REACH regulation

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

[www.renishaw.com/REACH](http://www.renishaw.com/REACH)

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### China RoHS

Contact Renishaw plc or visit [www.renishaw.com/ChinaRoHSCMM](http://www.renishaw.com/ChinaRoHSCMM) for the full China RoHS tabulation.



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# PHC10-3 PLUS international safety instructions

## BG - ПРЕДУПРЕЖДЕНИЕ

Моля, обърнете на приложение 1 и прочетете инструкциите за безопасност на вашия собствен език, преди за разпаковате и монтирате този продукт.

## CS - VÝSTRAHA

Před rozbalením a instalací tohoto výrobku si přečtěte bezpečnostní pokyny ve vlastním jazyce uvedené v příloze 1.

## DA - ADVARSEL

Læs sikkerhedsinstrukserne i Appendix 1 FØR udpakning og installation af dette produkt.

## DE - WARNHINWEIS

Bevor Sie dieses Produkt auspacken und installieren, konsultieren Sie bitte Anhang 1 und lesen Sie die Sicherheitshinweise in Ihrer Sprache.

## EL - ΠΡΟΕΙΔΟΠΟΙΗΣΗ

Γυρίστε στο Κεφάλαιο 1 και διαβάστε τις οδηγίες ασφαλείας στη δική σας γλώσσα προτού ανοίξετε αυτό το προϊόν για να το εγκαταστήσετε.

## EN - WARNING

Before unpacking and installing this product, please consult Appendix 1 and read the safety instructions in your language.

## ES - ADVERTENCIA

Consulte el apéndice 1 y lea las instrucciones de seguridad en su idioma antes de desempaquetar e instalar este producto.

## ET - HOIATUS

Palun vaadake 1. lisa ning lugege enne selle toote lahtipakkimist ja paigaldamist ohutusjuhend läbi.

## FI - VAROITUKSIA

Lue liitteessä 1 olevat omalla kielelläsi kirjoitetut turvaohjeet ennen tämän tuotteen pakkauksen avaamista ja asentamista.

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### FR - AVERTISSEMENT

Consulter l'annexe 1 et les instructions de sécurité dans votre propre langue avant de débiter et d'installer ce produit.

### GA - RABHADH

Téigh chuig agusín 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.

### HR - NAPOMENA

Prije nego što proizvod izvadite iz ambalaže i ugradite ga, otvorite Prilog 1 i pročitate sigurnosne upute na svom jeziku.

### HU – FIGYELMEZTETÉS

A termék kicsomagolása és telepítése előtt olvassa el az 1. számú függelékben található, az Ön anyanyelvén hozzáférhető biztonsági utasításokat.

### IT - AVVISO

Prima di aprire ed installare questo prodotto, leggere le istruzioni di sicurezza nella vostra lingua riportate nell'Appendice 1.

### JA - 警告

この製品を箱から取り出し設置する前に、付録 1 に記載された安全性に関する注意書きをお読みください。

### LT – ĮSPĖJIMAS

Prieš išpakuodami ir įdiegdami produktą, turite grįžti prie 1 priedo ir perskaityti nurodymus dėl saugos savo kalba.

### LV – BRĪDINĀJUMS

Pirms šī izstrādājuma izsaiņošanas un uzstādīšanas izskatiet 1. pielikumā sniegtās drošības instrukcijas savā valodā.

### MT - TWISSIJA

Jekk jogħġbok mur f'appendiċi 1 u aqra l-istruzzjonijiet tas-sigurtà fil-lingwa tiegħek qabel ma toħroġ dan il-prodott mill-ippakkjar u tinstallah.

### NL - WAARSCHUWING

Ga naar appendix 1 en lees de veiligheidsinstructies in uw eigen taal, voordat u dit product uitpakt en installeert.

### PL - OSTRZEŻENIE

Przed rozpakowaniem i zainstalowaniem tego produktu prosimy o zapoznanie się z Dodatkiem 1 i przeczytanie zaleceń dotyczących bezpieczeństwa w danym języku.



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### PT - ADVERTÊNCIA

Você deve retornar ao Anexo 1 e ler as instruções de segurança em seu idioma antes de desembalar e instalar este produto.

### RO - AVERTISMENT

Înainte de a desface ambalajul și a instala acest produs, vă rugăm să căutați Anexa 1 și să citiți cu atenție instrucțiunile de siguranță, în limba română.

### SK - VÝSTRAHA

Pred rozbalením a inštaláciou tohto produktu si pozrite prílohu 1 a prečítajte si bezpečnostné pokyny vo vašom jazyku.

### SL - OPOZORILO

Preden izdelek vzamete iz embalaže in ga vgradite, odprite Prilogo 1 in preberite varnostna navodila v svojem jeziku.

### SV - VARNING

Gå till bilaga 1 och läs säkerhetsinstruktionerna på ditt eget språk innan du packar upp och installerar denna produkt.

### ZH-TW - 警告

在拆開和安裝本產品之前，請翻頁至附錄 1 閱讀母語的安全指示。

### ZH - 警告

在拆包和安裝本產品之前，請翻到附录1，阅读中文版安全说明。

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# PHC10-3 PLUS 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.

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.

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

The expected method of providing an emergency stop for Renishaw products is to remove power.

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# PHC10-3 PLUS safety

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired. There are no user serviceable parts inside the equipment.

The PHC10-3 head controller is to be used with the provided PSU.

PSU electrical ratings	
Supply voltage	100 V - 240 Vac +10% -10%
Frequency range	50 Hz to 60 Hz
Power consumption	40 W max
Transient voltages	Installation category II

PHC10-3 is isolated from ac power by disconnection of the IEC mains connector from the supplied PSU. If any additional means of isolation is required, it must be specified and fitted by the machine manufacturer or installer of the product. The isolator / disconnection device must be sited within easy reach of the operator and comply with any applicable national wiring regulations for the country of installation.

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# PHC10-3 PLUS environmental conditions

The following environmental conditions exceed those as defined in BS EN 61010-1:2010:

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

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# PHC10-3 PLUS references and associated documents

It is recommended that the following documentation is referenced when installing the PHC10-3 PLUS:

## Renishaw documents

[Installation & user's guide: PH10 PLUS \(H-1000-7592\)](#)

[Installation & user's guide: PH10M-iQ PLUS \(H-1000-7564\)](#)

[User guide: HCU2 \(H-1000-5361\)](#)

[User guide: Product interconnection system \(PICS\) \(H-1000-5000\)](#)

USB driver package for PHC10-3 PLUS	
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# PHC10-3 PLUS introduction

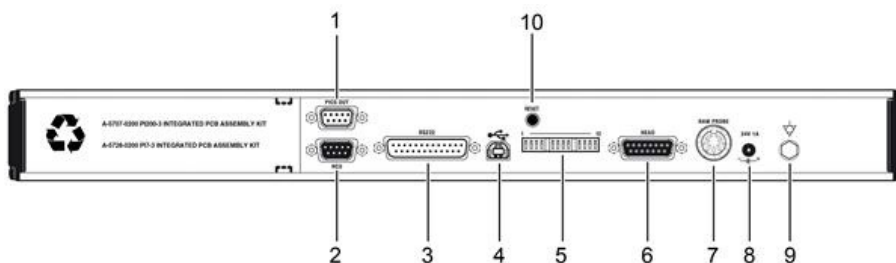
The guide gives information on physical installation, system connections, communications and interface settings, as well as assistance in fault-finding during the installation of PHC10-3 PLUS.

**WARNING:** No attempt should be made to connect the PH10 PLUS system to any other any other system components as incompatibility will result in damage to the product.

The guide should be read in conjunction with the PH10 PLUS series user's guide in order to fully understand the system's features, capabilities and operation.

The PH10 PLUS series of motorised probe heads can only be used in conjunction with the PHC10-3 PLUS when part of an OEM system installation. PHC10-3 PLUS has replaced the PHC10-2 and provides support for RS232 and USB communications (IEEE is no longer supported). PHC10-3 PLUS uses an external power supply for the PH10 PLUS series of heads, manages all the head functions and communicates via a suitable interface with the CMM's computer. PHC10-3 PLUS does not manage the probe functions but does have the provision for an interface to be fitted.

## Rear panel layout



Key	Description
1	9-way D-type plug for PICS output
2	9-way D-type connector to HCU2
3	25-way D-type plug RS232 communications connector to CMM computer
4	USB type "B" socket
5	PHC10-3 PLUS configuration switches
6	15-way D-type connector to probe head
7	7-pin DIN raw probe connector to probe interface or multiwire input for internal interfaces
8	DC power jack
9	Equipment bond point
10	Controller reset button

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# PHC10-3 PLUS configuration switches

## PHC10-3 PLUS switch settings

PHC10-3 PLUS switch	Function	Up	Down
<b>Communications</b>			
1#	Baud rate		
2#	Baud rate		
3#	Baud rate		
4*#	Stop bit	2 stop bits	1 stop bit
5*#	CTS protocol	CTS on	CTS off
6*#	LF protocol	LF on	LF off
9	Command set	Extended	Basic
<b>Interface</b>			
7	PICS configuration	PPOFF - active during head index	PPOFF - inactive during head index
8	HCU2 PROBE/DAMP/RESET	Enabled	Disabled
10	Probe reseal time	Extended	Standard
11	Interface connection	PICS / 7 pin DIN	5-pin DIN
12	Output configuration	PICS	DIN
13	Machine cable isolation	Machine cable	Multiwire

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

# Not required for USB operation default position = down



**NOTE:** Press the reset button after making switch changes.

## Conversion from PHC10-2 to PHC10-3 PLUS

PHC10-3 PLUS is designed to be a plug in functional replacement for PHC10-2. There are some differences which the user needs to be aware of, the connectors have been rearranged on the rear panel but are of the same type and are labelled in the same way. A USB connector has been added for those requiring USB communications. Unused switches have been removed and the remaining switches are now grouped in one row. See the next table for changes.

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### Changes in configuration switches

The table below is a summary of the differences between PHC10-3 PLUS and PHC10-2 configuration switch settings that allows you to correctly configure your PHC10-3 PLUS when replacing a PHC10-2.

PHC10-2 switch	PHC10-3 PLUS switch equivalent	Function	Up	Down
<b>Communications</b>				
1	1#	Baud rate		
2	2#	Baud rate		
3	3#	Baud rate		
4 (not used)				
5 (not used)				
6	4*#	Stop bit	2 stop bits	1 stop bit
7	5*#	CTS protocol	CTS on	CTS off
8	6*#	LF protocol	LF on	LF off
9	9#	Command set	Extended	Basic
10	10	Probe reseal time	Extended	Standard
<b>Interface</b>				
11	7	PPOFF	PPOFF - active during head index	PPOFF - inactive during head index
12	8	HCU2 probe, DAMP and probe reset buttons	Enabled	Disabled
13 (not used)				
14 (not used)				
15+16	12	Output configuration	PICS	DIN
17+18	11	Interface connection	PICS or 7-pin DIN operation	5-pin DIN operation only
	13	Probe wire isolation	Machine cable	Multiwire

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

# Not required for USB operation default position = down

 **NOTE:** Switches 4,5,13 and 14 had no function in PHC10-2.

 **NOTE:** Download the USB driver package for PHC10-3 PLUS [here](#).



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# PHC10-3 PLUS PICS connection

## PICS interface configuration

If PHC10-3 PLUS is to be used in a PICS linked system, the PPOFF configuration is selected using switch 7.

Switch	Description	Position	Information
7	PPOFF	UP	PPOFF and PDAMP active during head index
7	PPOFF	DOWN	PDAMP only active during head index

## 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 'raw probe' connection.

The following descriptions are specific to PHC10-3 PLUS PICS connections when an internal interface is not present. Please refer to the PICS installation guide (Renishaw part number H-1000-5000) for further information when interfaces are fitted.

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Pin	Signal	Function	
1	STOP	This signal is active when low and is responded to, and can be asserted by the PHC10-3 PLUS .	Read from PHC10-3 PLUS to indicate an error in the PH10 system. Pull down to 0 V to indicate a STOP condition external to the PH10 PLUS system.
2	PPOFF	PPOFF is an active low inhibit signal which can be set by the CMM computer or the PHC10-3 PLUS. PPOFF is overridden by the use of the STOP signal.	-
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 PHC10-3 PLUS when a multiwire cable is not in use. As these signals have not been interfaced, it is important that the PICS cable between the PHC10-3 PLUS and the interface is less than 0.5 m (1.6 ft) otherwise interference from other PICS signals can occur.	-
6	Reserved	-	-
7	PDAMP	PDAMP is an active low signal which can be set by the CMM computer, the PHC10-3 PLUS or by the optional HCU2. 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 PHC10-3 PLUS, but it responds to LED OFF by switching the head LED off.	-
9	Probe return	See pin 5	-
-	Screen	-	-

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# PHC10-3 PLUS front panel LEDs

## PHC10-3 PLUS LED description



Name	Colour	Function
POWER	Green	Power on when lit
STOP	Red	PHC10-3 PLUS asserting PICS STOP when lit PI 200-3 asserting PICS STOP when flashing
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, non PLUS interface fitted
OVERLOAD ERROR	Red	Head overload error when lit
TP7	Green	TP7 detected when lit
TP200	Green	TP200 detected when lit
STD	Green	TP2 / TP20 / TP6 detected when lit
SEATED	Green	Probe seated when lit
DAMPED	Yellow	Probe damped when lit



**NOTE:** The probe reset button on the front of PHC10-3 PLUS only functions if a probe interface card is installed within the unit.

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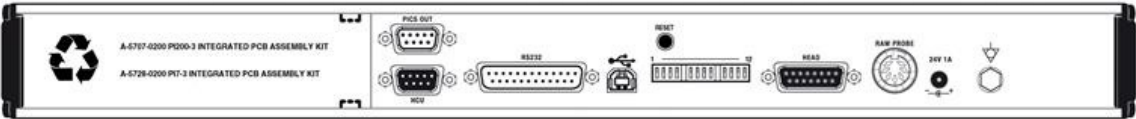
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## PHC10-3 PLUS variants

PHC10-3 PLUS is available in three options:

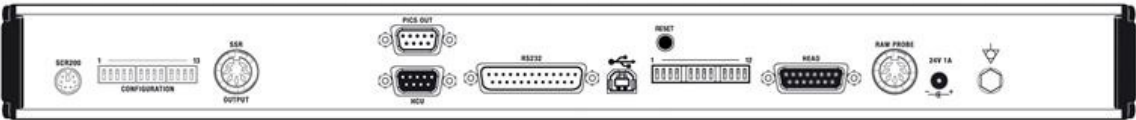
Standard PHC10-3 PLUS with provision for interface card to be inserted

(Renishaw part number A-5863-0100)



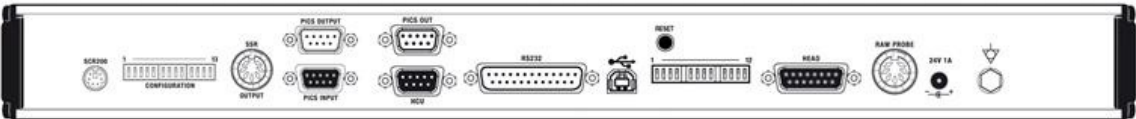
PHC10-3 PLUS with single rear panel and integrated PI 200-3 probe interface

(Renishaw part number A-5863-0200)



PHC10-3 PLUS with integrated PI 200-3 probe interface and external PICS loop

(Renishaw part number A-5863-0300)



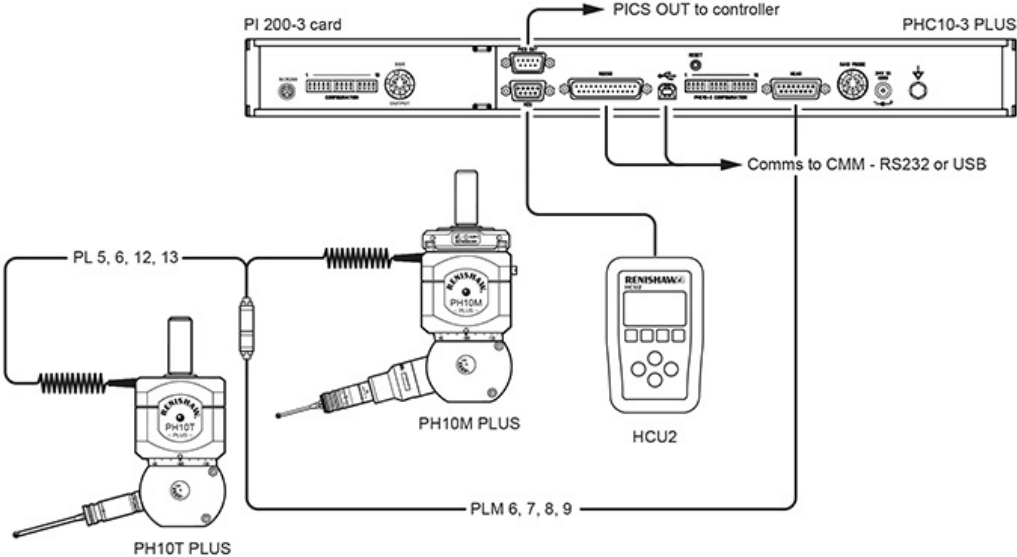
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## PHC10-3 PLUS system interconnection diagrams

PH10 PLUS system with standard two wire touch-trigger probes

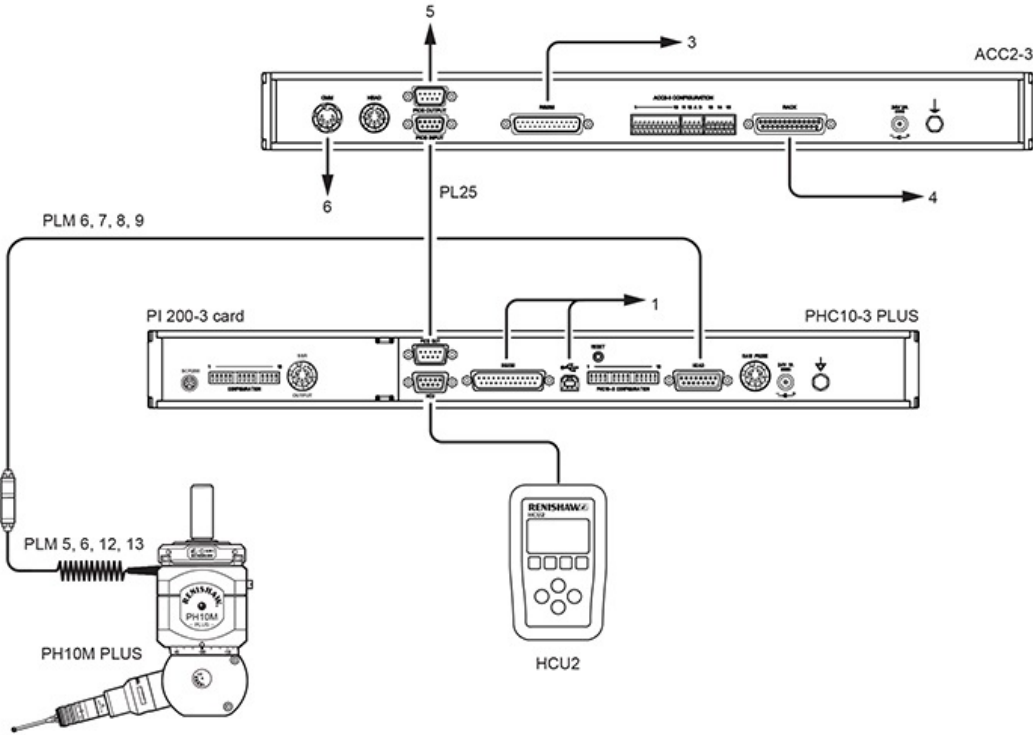
With internal PI 200-3



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PH10 PLUS system with standard two wire touch-trigger probes  
 With internal PI 200-3 and autochange

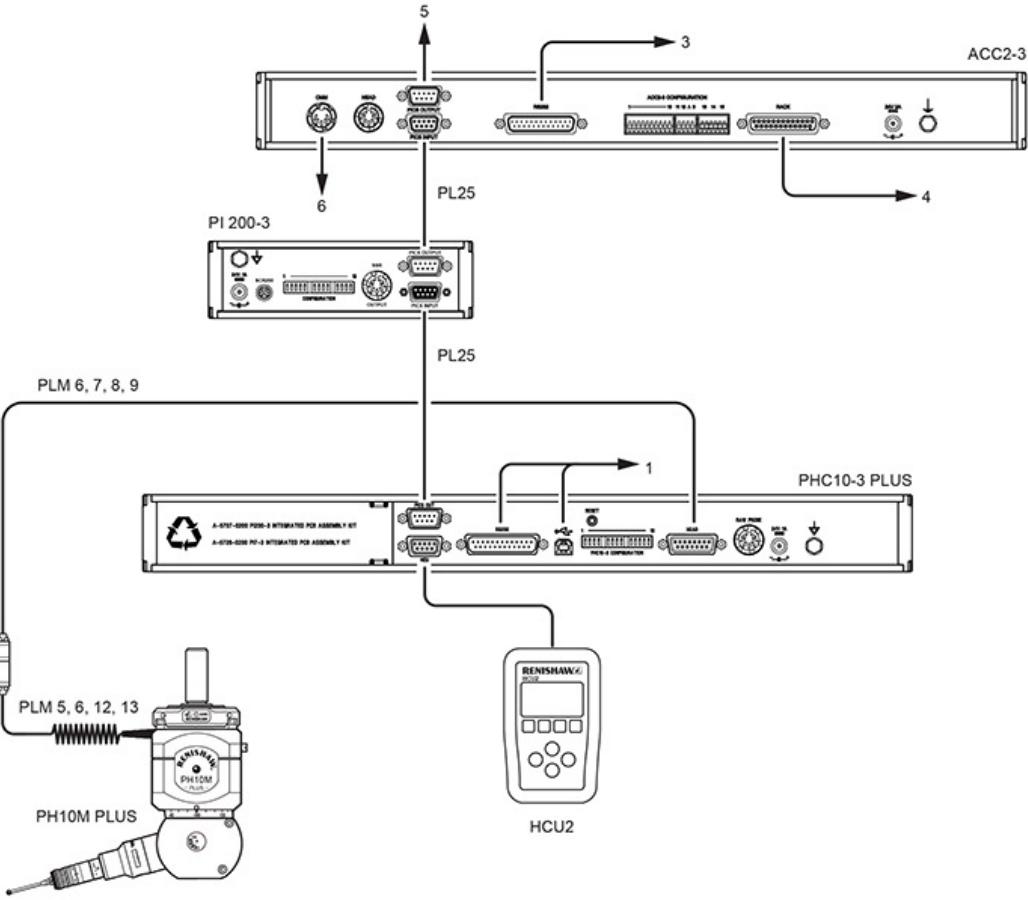


Key	Description
1	Communication connection to CMM controller RS232 or USB
3	Communication to CMM controller
4	Communication to autochange rack
5	PICS output to CMM controller
6	Probe output to CMM controller

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PH10 PLUS system with standard two wire touch-trigger probes  
With external PI 200-3 and autochange

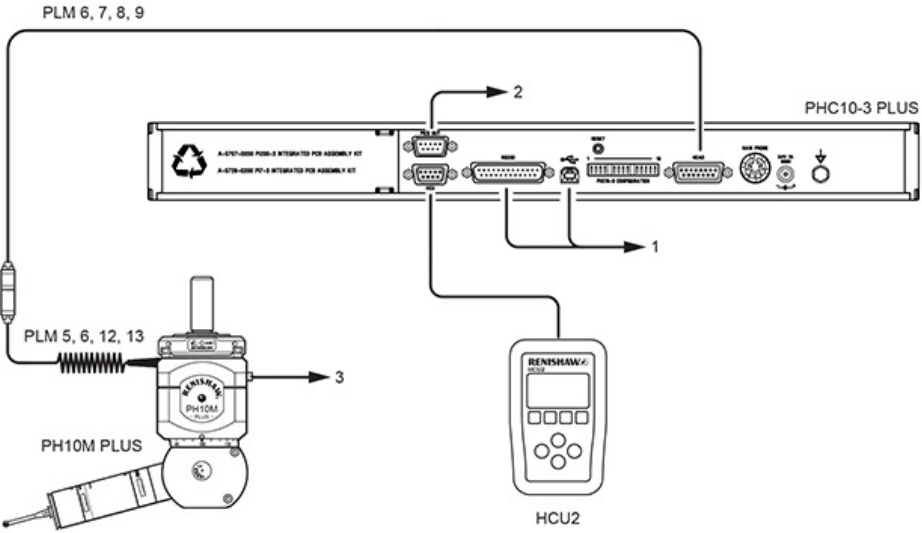


Key	Description
1	Communication connection to CMM controller - RS232 or USB
3	Communication to CMM controller
4	Communication to autochange rack
5	PICS output to CMM controller
6	Probe output to CMM controller

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## PH10 PLUS system with multiwire scanning probes



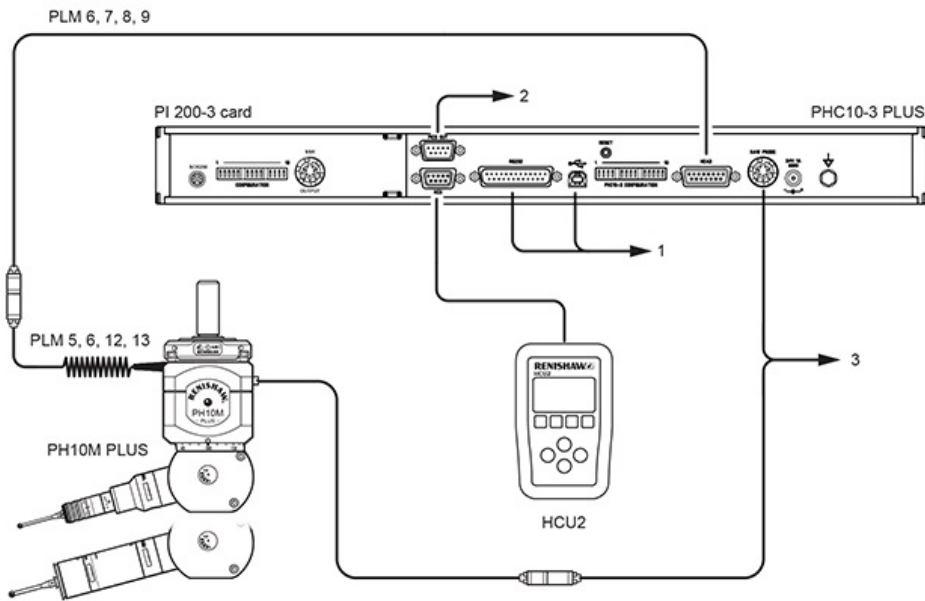
Key	Description
1	Comms to CMM controller
2	PICS to CMM controller
3	Multiwire to probe interface



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### PH10 PLUS system with multiwire scanning and touch-trigger probes with internal PI 200-3



Key	Description
1	Comms to CMM controller
2	Touch-trigger probe and PICS to CMM controller
3	Multiwire to probe interface

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# PHC10-3 PLUS RS232 setup

## RS232 connector pinouts

The PHC10-3 PLUS communicates with the CMM computer via the RS232 cable as shown in the table below:

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 +12 V after initialisation routine completed
5	CTS (clear to send) from CMM computer CMM computer de-asserts CTS to halt PHC10-3 PLUS transmissions Connect pin 5 to pin 20 if CTS is not output from CMM computer
7	Signal ground (common)
20	DTR (data terminal ready) to CMM computer signifies PHC10-3 PLUS power ON condition

## Baud rate selection

The baud rate is set using switches 1 to 3 as shown in the table 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



**NOTE:** To implement any changes press the "reset" button on the rear panel. Failure to do so will mean the changes do not take effect.

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### Protocol selection

The PHC10-3 PLUS 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 (recs)
9	DOWN	Basic command set mode

### Basic command set mode

In this mode the PHC10-3 PLUS is fully compatible with existing integration methods in terms of communications protocols, software command set and RS232 protocol options.

#### Basic command set protocol

Switch	Position	Selection
4	UP	2 stop bits
4	DOWN	1 stop bit
5	UP	CTS (clear to send) ON
5	DOWN	CTS (clear to send) OFF
6	UP	LF (line feed) ON
6	DOWN	LF (line feed) OFF

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 4)

Protocols: PHC10-3 PLUS RTS is asserted before first transmission from the head and remains asserted. If switch 5 is UP, CTS must be asserted by the CMM computer to allow the head to transmit. If switch 6 is UP, the PHC10-3 will add an ASCII LF character to every transmitted message.

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### Extended command set mode

In this mode the PHC10-3 PLUS 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. The extended command set offers the following advantages over the basic command set:

- Software control of the hand control unit (HCU2) functions such as jog and sweep
- Software control of selected PICS (product interconnection 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

Please contact Renishaw for further details of the extended command set.



**NOTE:** The functions of switches 4, 5 and 6 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:

- PHC10-3 PLUS RTS is normally asserted. It is de-asserted when the PHC10-3 PLUS is unable to receive further transmissions.
- The PHC10-3 PLUS CTS must be asserted (by the CMM computer, or by linking DTR to CTS) to allow the PHC10-3 to transmit.

XON/XOFF:

- The extended command set supports the use of XON/XOFF flow control by the CMM computer.
- If the PHC10-3 PLUS receives an XOFF character, PHC10-3 PLUS transmissions will cease and be buffered until an XON character is received by the PHC10-3 PLUS or the output buffer overflows.
- It is possible to continue transmissions to the PHC10-3 PLUS 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.

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# PHC10-3 PLUS USB communications

USB communication is via the USB type 'B' socket on the rear panel. The PHC10-3 PLUS is self powered and therefore takes no power from the PC bus. The PHC10-3 PLUS will switch automatically from RS232 to communicate via the USB port if a powered up cable is connected.



**NOTE:** Only one type of communications cable is to be inserted at any time. If in USB mode and the cable is removed, the PHC10-3 PLUS will assert PICS STOP.

Switches 1 to 6 have no function when operating via USB. They may be set to the default down position or left in the RS232 positions.

Switches 7, 8, 9, 11, 12 and 13 will operate as described in the interface switches section.

To operate via the USB port the CMM PC will require the correct USB drivers to be loaded.



**NOTE:** Download the USB driver package for PHC10-3 PLUS [here](#).

To load the drivers power up a PHC10-3 and connect to the CMM PC via a USB cable. The CMM PC operating system should recognise the new hardware and the 'found new hardware' wizard will offer to search for the driver.

To conform to USB standards a maximum cable length of 5 m may be used. If a longer distance is required a hub may be used to extend another 5 m. The maximum length of hubs / cables is 30 m. It is suggested that the PHC10-3 should not share its USB port with any high data rate device which may slow down its response time. Devices such as video cameras and disc drives for example should be avoided if possible.

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# Interface switch descriptions

## HCU2 operation

When the system is used in conjunction with an HCU2 hand control unit, the probe damp and probe reset buttons on the HCU2 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 HCU2 can be made inactive by use of a switch on the rear panel of the PHC10-3.

Switch	Description	Position	
8	Operation of HCU2 probe damping and probe reset	UP	Enabled
8	Operation of HCU2 probe damping and probe reset	DOWN	Disabled

## Probe reseal time

The extended probe reseal timer on the PHC10-3 PLUS unit is designed to be used where the touch probe fails to fully seat within the standard reseal period following a head index move (e.g. when using long extension bars).

Switch	Description	Position	
10	Time permitted for probe to reseal following a head index	UP	Extended
10	Time permitted for probe to reseal following a head index	DOWN	Standard

## Interface connection

Switch	Description	Position	
11	Probe connection	UP	PICS or 7-pin DIN operation: the PHC10-3 PLUS internal inhibit relay disables the interface during a head index
11	Probe connection	DOWN	5-pin DIN operation only: the PHC10-3 internal inhibit relay disables the probe during a head index

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### Output configuration

The PHC10-3 PLUS can be connected to a probe interface via the PICS connection or via the raw probe connection (7-pin DIN connector).

Switch	Description	Position	
12	Probe output configuration	UP	PICS
12	Probe output configuration	DOWN	DIN

### Probe wire isolation

The probe wires need to be isolated from the machine cable wiring when used with multiwire systems. This is controlled by switch 13.

Switch	Description	Position	
13	For use with machine cable	UP	Machine cable
13	Multiwire option for use with PL172	DOWN	Multiwire

### PICS STOP assertion

The PHC10-3 PLUS will assert STOP under the following conditions:

Condition	Notes
Overload error	Head has been overloaded when locked causing it to unlock.
Obstruct error	Head has been obstructed when moving to requested position.
Datum error	Head is unable to lock into the requested position.
Head disconnect	STOP will be asserted for two seconds if head is disconnected.
Power failure	Stop signal will be permanently asserted if mains power is removed from PHC10-3 PLUS.
USB cable disconnected	PICS STOP will be asserted if USB cable is used and removed during operation.

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The reaction to assertion of PICS STOP to the system and effect of the signal removal are detailed below:

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 HCU2 after STOP asserted.	Single step manual movement only - continuous movement is disabled but head can be moved slowly as a safeguard movement. Head will lock up as normal when movement key is released.	Continuous movement enabled.
System in manual mode - STOP asserted during manual move by HCU2.	Continuous head movement is immediately disabled - head will continue to move in single steps. Head will lock up as normal when movement key is released.	Continuous movement enabled.
System in automatic mode - stop asserted before update command received.	PHC10-3 PLUS 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.	Update command will cause the head to complete its move.



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# Head connector and cables

**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 PHC10-3 PLUS should be no more than 2.5 ohm.

## Head connector cables

- PHC = probe head cable
- MC = machine cable

	MC	MC	MC / PHC	PHC	PHC	
Signal name	15-way male 'D' type	Cable PLM 6 - 9	14-way LEMO	12 core cable	14-way Tuchel socket	Max line current
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	12 mA
0 V	4	Green / red	(F) 4 (M)	Grey	M	1000 mA
Locking motor 8 V 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	(F) 8 (M)	Dark blue	F	350 mA
B-axis motor / probe contact	7	Pink	(F) 9 (M)	Violet	A	350 mA
B-axis motor / probe contact	15	Orange	(F) 10 (M)	Black	B	350 mA
Screen	Body	Screen	(F) 11 (M)	Screen	N, O	-----
A-axis feedback	3	Yellow	(F) 12 (M)	Orange	G	n/a
LED and datum	8	Blue	(F) 13 (M)	Turquoise	J	15 mA
Motor probe switch	5	Grey	(F) 14 (M)	Pink	K	40 mA



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

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### Motorised head cables

The table below shows the standard range of motorised head cables available from Renishaw:

- PHC = probe head cable
- MC = machine cable

Cable	Name	Length	Type	Connector	Connects to	Connector	Connects to
PHC	PL5	0.1 m to 0.8 m	Coiled	Tuchel socket	Head	14-pin LEMO plug	MC
PHC	PL6	0.8 m to 1.6 m	Coiled	Tuchel socket	Head	14-pin LEMO plug	MC
PHC	PL12	0.1 m	Plain	Tuchel socket	Head	14-pin LEMO plug	MC
PHC	PL13	0.1 m to 0.2 m	Coiled	Tuchel socket	Head	14-pin LEMO plug	MC
MC	PLM6	6.0 m	Plain	15-pin D-plug	PHC10-3 PLUS	Chassis 14-pin LEMO socket	PHC
MC	PLM7	4.0 m	Plain	15-pin D-plug	PHC10-3 PLUS	Chassis 14-pin LEMO socket	PHC
MC	PLM8	6.0 m	Plain	15-pin D-plug	PHC10-3 PLUS	Line 14-pin LEMO socket	PHC
MC	PLM9	4.0 m	Plain	15-pin D-plug	PHC10-3 PLUS	Line 14-pin LEMO socket	PHC

### Raw probe connector pinouts

Pin	Description
1	Head LED cathode / probe present
2	Ground
3	Head LED anode
4	Probe return
5	Probe signal
6*	Probe inhibit return
7*	Probe inhibit signal



\*NOTE: Only present when probe connection switch 11 is UP.

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# PHC10-3 PLUS power supply

## Powering the PHC10-3 PLUS

The PHC10-3 PLUS controller is rated to operate at +24 Vdc, 1 A max input current. It should be connected via Ø5.5 mm dc jack plug to the provided 24 Vdc 40 W power supply. If an internal interface is fitted with the PHC10-3 PLUS it will obtain its power internally from the PHC10-3 PLUS controller.

An equipment bonding point is provided on the rear panel for connection to the rest of the installation. The PHC10-3 PLUS does not require a protective earth.

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# PHC10-3 PLUS installation

## Dimensions



**i** NOTE: Dimensions in mm (in).

Weight	1.5 kg (3 lb 3 oz)
--------	--------------------

The PHC10-3 PLUS controller can be used in a 19 inch rack system or as a stand-alone unit.

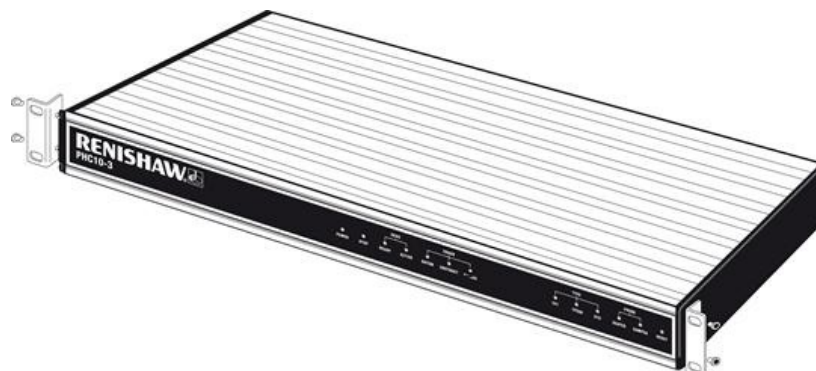
**!** CAUTION: Ensure the controller is disconnected from the power supply during installation.

## Stand-alone installation

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

## Mounting in a 19 inch rack

The rack mounting kit A-1018-0189 contains two brackets and four M5 × 6 mm screws. Assemble the brackets to the PHC10-3 PLUS as shown below.



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# PHC10-3 PLUS troubleshooting

This section on troubleshooting is a guide to problems associated with the installation and integration of the system only. Refer to the 'PH10 PLUS installation and user's guide' (Renishaw part number H-1000-7592) regarding problems associated with normal operation of the system.

The optional HCU2 can also be used to identify system faults. For full details of the use and fault finding capability of the unit see the 'HCU2 hand control unit user's guide' (Renishaw part number H-1000-5361).

Use the table below 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.

## Power on LED not lit

Possible cause	Solution
Power loss	Check mains cable connections and integrity. Check power block is supplying 24 V. Check CMM emergency stop condition - power may have been removed by CMM.

## No head movement in automatic mode

Possible cause	Solution
Head controller in manual mode.	Change to automatic mode.
Power loss	Check mains cable connections and integrity. Check power block is supplying 24 V. Check CMM emergency stop condition - power may have been removed by CMM.
Cable / connection fault	Check connection and integrity of cabling between head and controller.
Communications failure	Check RS232 baud rate.
Incorrect command set selected	Check correct command set is selected.
PICS STOP is asserted by other system component	Clear the fault asserting PICS STOP.

## No head movement in manual mode

Possible cause	Solution
Head controller in automatic mode.	Change to manual mode.
Power loss	Check mains cable connections and integrity. Check power block is supplying 24 V. Check CMM emergency stop condition - power may have been removed by CMM.
Cable / connection fault	Check connection and integrity of cabling between head and controller.

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### No probe output signal received by the CMM computer

Possible cause	Solution
Cable / connection fault	Check connection and integrity of cabling between head and controller. Check connection and integrity of cabling between controller and interface. Check connection and integrity of cabling between interface and computer.
Multiwire bypass connector not fitted	Fit a multiwire bypass connector with will permit a standard touch-trigger probe signal to reach controller
Multiwired probe in use	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

Possible cause	Solution
Loose head mounting	Ensure all mounting screws are tight and that mounting to the CMM is secure.
Probe incorrectly attached	Remove probe and reattach.
Force applied to head during lock up	Lock and unlock the head.
Incorrect lock up position	Reposition head correctly.
Position not qualified	Check qualification information.
Probe damping enabled during measurement	Ensure probe damping is not enabled during measurement moves.

# PHC10-3 PLUS maintenance

There are no user serviceable parts inside any PH10 PLUS system components. Components requiring attention must be returned to an authorised Renishaw customer service centre.

## Cleaning

The probe head, controller and hand control unit should only be cleaned with a soft, dry, lint-free cloth.

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# Appendix 1 - PHC10-3 PLUS international safety warnings

## 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 машинни инструменти или СММ (машини за измерване на координатите).

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 продуктовата документация на Renishaw, и да гарантира осигуряване на съответни предпазители и безопасителни 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.

Ако оборудването се използва по начин, който не е указан от производителя, това може да се отрази неблагоприятно на осигуряването от оборудването защита.

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



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### 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 hlavičky, prodloužení a sondy.

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

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

Před započítím jakékoliv 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.

Pokud je zařízení používáno způsobem, který není specifikován výrobcem, může dojít ke snížení ochrany poskytované zařízením.

Předpokládaným způsobem nouzového zastavení produktů společnosti Renishaw je odpojení napájení.

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### DA - ADVARSLER

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.

Se under vedligeholdelse i produktokumentationen for at få instruktioner til sikker rengøring af Renishawprodukter.

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 produktokumentation, 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.

Hvis udstyret anvendes på en måde, som ikke er specificeret af producenten, kan udstyrets beskyttelse blive påvirket.

Den forventede metode til nødstop af Renishawprodukter er afbrydelse af strømforsyningen.

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### DE - SICHERHEITSANWEISUNGEN

Zwischen zwei beweglichen und zwischen beweglichen und statischen Teilen besteht Einklemmgefahr. Der Messtasterkopf darf während des Betriebs oder einem Messtasterwechsel nicht festgehalten werden.

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

Bei Arbeiten an Koordinatenmessgeräten und Werkzeugmaschinen wird ein Augenschutz empfohlen.

Anleitungen zur sicheren Reinigung von Renishaw Produkten sind im Kapitel Wartung 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 signalisiert. Verlassen Sie sich nicht alleine auf das Messtastersignal, um Maschinenbewegungen zu stoppen.

Wird das Gerät für einen nicht vom Hersteller spezifizierten Zweck benutzt, kann dies zu einer Beeinträchtigung des vom Gerät bereitgestellten Schutzes führen.

Halten Sie Renishaw Produkte im Notfall durch Ausschalten der Stromversorgung an.

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### ΕΛ - ΠΡΟΕΙΔΟΠΟΙΗΣΕΙΣ

Υπάρχει κίνδυνος συμπίεσης μεταξύ κινούμενων μερών καθώς και μεταξύ 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 ξαφνικές 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.

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.

Ανατρέξτε στις 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 και 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.

Εάν ο εξοπλισμός χρησιμοποιείται με τρόπο μη προδιαγεγραμμένο από τον κατασκευαστή, η παρεχόμενη προστασία του εξοπλισμού πιθανώς να παρεμποδίζεται.

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

## PHC10-3 PLUS installation guide

[www.renishaw.com](http://www.renishaw.com)

### 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.

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.

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

The expected method of providing an emergency stop for Renishaw products is to remove power.

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### ES - AVISOS

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.

Tenga 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-Herramienta y máquinas de medición de coordenadas.

Para instrucciones sobre seguridad a la hora de limpiar los productos Renishaw, remitirse a la sección de mantenimiento en la documentación sobre el producto.

Quite la corriente antes de realizar cualquier operación de mantenimiento.

Remítase 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.

En determinadas circunstancias, la señal de la sonda puede indicar erróneamente que la sonda está asentada. No confíe en las señales de la sonda para detener la máquina.

Si no se cumplen las indicaciones especificadas por el fabricante para la utilización del equipo, la protección de este puede resultar inutilizada.

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

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### ET - HOIATUSED

Muljumisoht eksisteerib masina liikuvate ning liikuvate ja liikumatute osade vahel. Ärge hoidke masina liikumise ajal või sondi käsitsi vahetamise ajal sondipeast kinni.

Olge ettevaatlik ootamatute liikumiste suhtes. Kasutaja peab jääma väljapoole sondipea ja sondipikendi tööulatust.

Kõikide rakenduste puhul, mis kasutavad tööpinke või koordinaatmõõtemasinaid, on soovitatav kasutada kaitseprille.

Renishaw' toodete ohutu puhastamise juhised on toodud vastava toote dokumentatsioonis.

Enne hooldustööde tegemist ühendage seade toiteallikast 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 viidata valesti sondiga seotud olukorrale. Ärge lootke masina liikumise peatamiseks sondi signaalile.

Kui seadet kasutatakse viisil, mida tootja ei ole ette näinud, võib seadme pakutav kaitse väheneda.

Esmaseks masina hädaseiskamise meetodiks on Renishaw' toodete puhul elektritoite katkestamine.

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### FI - VAROITUS

Liikkuvien osien ja staattisten osien välillä on litistymisvaara. Älä pidä kiinni anturin päästä sen liikkuessa tai vaihtaessasi anturia käsin.

Varo odottamatonta liikettä. Käyttäjän tulee pysyä anturin pään, lisäosien ja anturiyhdistelmien toimintasäteen ulkopuolella.

Silmänsuojainten käyttö on suositeltavaa kaikkia työstökoneita ja koordinoituja mittauskoneita (CMM) käytettäessä.

Renishaw-tuotteiden turvalliset puhdistusohjeet löytyvät kunkin tuotteen huolto-ohjeista.

Katkaise virta ennen huoltotoimenpiteiden suorittamista.

Tutustu koneen toimittajan käyttöohjeisiin.

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 suojukset ja turvalukitukset ovat riittävät.

Tietyissä olosuhteissa anturilta tuleva signaali saattaa virheellisesti osoittaa, että anturi on paikallaan. Älä luota siihen, että anturin signaalit pysäyttävät varmuudella koneen liikkumisen.

Jos laitetta käytetään valmistajan ohjeista poikkeavalla tavalla, sen suojavaikutus voi olla puutteellinen.

Renishaw-tuotteiden hätäpysäytys tehdään tavallisesti katkaisemalla virransyöttö.



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www.renishaw.com

### 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 lors du chargement manuel du palpeur.

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

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

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 de s'assurer que l'utilisateur a pris connaissance des dangers d'utilisation, y compris ceux décrits dans la documentation du produit Renishaw, et de s'assurer que des protections et verrouillages de sûreté adéquats sont prévus.

Il peut arriver dans certains cas que le signal du palpeur indique à tort son état "au repos". Il ne faut pas se fier aux signaux venant du palpeur car ils ne garantissent pas toujours l'arrêt de la machine.

Si l'équipement est utilisé d'une façon contre indiquée par le fabricant, la protection fournie par le matériel peut être compromise.

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

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### GA - RABHAIDH

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, ná nuair atá tóireadóir á athrú.

Fainic an chorraíl gan choinne. Ba cheart don úsáideoir fanacht lasmuigh de chlúdach iomlán oibre cheann/shíneadh/theaglamaí an tóireadóra.

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

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

Bain an chumhacht de sula ndéantar aon oibríochtaí cothabhála.

Déan tagairt do threoracha oibríúcháin sholáthraí an mheaisín féin.

Is í freagracht sholáthraí an mheaisín í chun a chinntiú go gcuirtear an t-úsáideoir ar an eolas i leith aon ghuaiseacha a bhaineann leis an oibríúchán, lena n-áirítear iad siúd a luaitear i gcáipéisíocht táirge Renishaw, agus chun a chinntiú go soláthraítear sciatha cosanta agus idirghlais sábháilteachta leordhóthanacha.

Féadtar toisc bhréagach tóireadóra-shuite a léiriú i roinnt cúinsí le comhartha an tóireadóra féin. Ná bí ag brath ar chomharthaí tóireadóra le gluaiseacht an mheaisín a stopadh.

Má úsáidtear an trealamh ar bhealach nach bhfuil mionsonraithe ag an déantúsóir, d'fhéadfadh an chosaint sa trealamh bheith lagaithe.

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

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### HR - NAPOMENA

Između dijelova u pokretu i između pokretnih i statičkih dijelova postoji opasnost od uklještenja. Tijekom pomicanja ili ručne zamjene sonde, nemojte držati glavu sonde.

Budite oprezni zbog mogućnosti neočekivanog pomicanja. Korisnik mora ostati izvan punog radnog dometa glave sonde/produžetka/kombinacija sonde.

Kod svih primjena koje uključuju upotrebu alatnih strojeva ili CMM-ova preporučuje se zaštita očiju.

Za upute o sigurnom čišćenju proizvoda Renishaw proučite informacije o održavanju u odgovarajućoj dokumentaciji proizvoda.

Isključite napajanje prije provođenja bilo kakvih radova održavanja.

Proučite upute za rad dobavljača stroja.

Dobavljač stroja dužan je osigurati da korisnik bude upozoren na sve opasnosti tijekom rada, uključujući one navedene u dokumentaciji proizvoda Renishaw, te mora osigurati odgovarajuće zaštite i sigurnosne blokade.

Pod određenim okolnostima signal sonde može lažno pokazivati stanje položaja sonde. Nemojte se pouzdati da će signali sonde zaustaviti kretanje stroja.

Ako se oprema koristi na način koji se razlikuje od onoga koji navodi proizvođač, zaštita opreme se može narušiti.

Očekivana metoda omogućavanja zaustavljanja u nuždi za proizvode Renishaw je isključenje napajanja.

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### HU - FIGYELMEZTETÉSEK

A mozgó alkatrészek, illetve a mozgó és álló alkatrészek között becsípődés veszélye áll fenn. A tapintófejet ne fogja meg mozgás, vagy a tapintó kézzel történő cseréje közben.

Legyen óvatos a nem várt mozgások tekintetében. Tartózkodjon a tapintófej és hosszabbítójának teljes mozgáskörzetén kívül!

Szerszámgépek és koordináta-mérőgépek használata során mindig javasolt a szemvédő viselése.

A Renishaw szerszámgépek biztonságos tisztítására vonatkozó előírásokat megtalálja a megfelelő termékismertető, karbantartás fejezetében.

Karbantartási munkák előtt mindig áramtalanítsa a gépet.

Ezzel kapcsolatban tekintse át a gép gyártója által kiadott kezelési utasítást.

A gép gyártójának kötelessége felhívni a felhasználó figyelmét a berendezés használata során fennálló valamennyi veszélyre, beleértve a Renishaw termékeihez tartozó dokumentációban említett kockázatokat is; emellett az ő felelőssége a megfelelő védőelemek és biztonsági megszakító berendezések biztosítása is.

A tapintó jel, bizonyos körülmények között, tévesen jelezheti, hogy a tapintó még nem tért ki. Ne hagyatkozzon a tapintó jelére, ha meg kell állítani a gépet.

Ha az eszközt a gyártó által előírt módtól eltérő módon használják, a felszerelés által nyújtott védelem érvénytelenné válik.

A Renishaw termékei esetében a vészleállítás megfelelő módja a tápellátás megszüntetése.

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### 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 protettivi in applicazioni che comportano l'utilizzo di macchine utensili e macchine di misura a coordinate.

Per le istruzioni relative alla pulizia dei prodotti Renishaw, fare riferimento alle informazioni di manutenzione nella 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 di Renishaw, e di fornire dispositivi di sicurezza e interblocchi di sicurezza adeguati.

È possibile che in certe situazioni venga erroneamente prodotto un segnale che indica che la sonda è in posizione. Non fare affidamento sui segnali di stato sonda per arrestare il movimento della macchina.

Il grado di protezione normalmente fornito sui dispositivi potrebbe essere reso meno efficace in caso di utilizzo non conforme a quanto specificato dal produttore.

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

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### JA - 警告

可動部の間または可動部と固定部の間に指などが挟まれる危険があります。駆動中やプローブの手動交換中は、プローブヘッドを手で持たないでください。

予想外の動作に注意してください。プローブシステムの可動範囲内に入らないでください。

工作機械や三次元測定機を使用する場合は、保護眼鏡の着用を推奨します。

レニショー製品を清掃する場合は、関連する製品の説明書のメンテナンスに関するセクションを参照してください。

メンテナンス作業を行う前には必ず、電源を切ってください。

機械メーカーの操作説明書を参照してください。

レニショーの製品説明書に記載されている内容も含め、操作に伴うあらゆる危険性をユーザーへ周知してください。また、適切な保護機構とインターロックシステムの設置は、各工作機械メーカーの責任で行なってください。

ある状況下では、プローブ信号出力が正しく出力されない場合もあります。プローブ信号のみに頼って機械を停止させないようにしてください。

本製品をメーカーが指定する方法以外で使用した場合、本製品の保護性能・機能が低下することがあります。

レニショー製品を緊急停止する場合には、電源供給を切って緊急停止してください。

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### LT - ĮSPĖJIMAI

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

Saugokitės netikėtų judesių. Naudotojas turi saugotis patekti į bet kurią zondo galvutės / ilgintuvo / zondų junginio veikimo zonos dalį.

Atliekant visus darbus, kai naudojami įrenginio įrankiai, įrenginys valomas ir prižiūrimas, rekomenduojama užsidėti apsauginius akinius.

„Renishaw“ gaminių saugaus valymo instrukcijas rasite priežiūros nurodymuose, pateikiamuose kartu su gaminiu.

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 apie pavojus, minimus „Renishaw“ prietaiso techninėje dokumentacijoje, ir kad būtų sumontuoti atitinkami apsauginiai įrenginiai bei blokatoriai.

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

Jei įranga naudojama ne taip, kaip nurodo gamintojas, gali sumažėti įrangos teikiama apsauga.

Tinkamiausias būdas sustabdyti „Renishaw“ prietaisą – nutraukti elektros srovės tiekimą.

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### LV - BRĪDINĀJUMS

Pastāv risks tikt saspiestam starp kustīgajām daļām, kā arī starp kustīgajām un nekustīgajām daļām. Neturiet zondes galviņu kustības laikā vai manuāli mainot zondi.

Uzmanieties no nejaušām kustībām. Lietotājam jāpaliek ārpus zondes galviņas/uzgaļa/kontaktmērgalviņas pilna darbības rādiusa.

Izmantojot darba iekārtas vai koordinātu mērīšanas ierīces, ieteicams izmantot acu aizsarglīdzekļus.

Lai uzzinātu par drošu „Renishaw” izstrādājumu tīrīšanu, attiecīgā izstrādājuma dokumentācijā izlasiet informāciju par apkopi.

Atvienojiet izstrādājumu no strāvas pirms jebkuru apkopes darbu veikšanas.

Skatiet iekārtas piegādātāja ekspluatācijas instrukcijas.

Iekārtas piegādātājs atbild par to, lai lietotājs tiktu 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 zondes signāls var nepareizi norādīt zondes stāvokli. Nepaļaujieties uz zondes signāliem, lai apturētu iekārtas kustību.

Ja iekārtu lieto neatbilstīgi ražotāja norādēm, tās nodrošinātā aizsardzība var mazināties.

Ir paredzēts, ka „Renishaw” izstrādājumu avārijas apturēšanai lietotājs to atvienos no strāvas.



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### MT - TWISSIJJET

Jeżistu perikli li persuna tinqaras bejn il-partijiet li jkunu jiċċaqilqu u l-partijiet statiči. Iżzommx ir-ras tas-sonda waqt il-moviment, jew meta tkun qiegħed/qiegħda tibdel sonda.

Oqgħod attent għal moviment mhux mistenni. L-utent għandu jibqa' 'l barra miż-żona kompleta tal-operat tal-kombinazzjonijiet tat-tagħmir tal-probe head/extension/probe.

Fix-xogħol kollu li jinvolvi l-użu ta' għodda tal-magni jew CMMs, il-protezzjoni tal-għajnejn hi rakkomandata.

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

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

Irreferi għall-istruzzjonijiet tal-operat tal-fornitur tal-magna.

Hi r-responsabbiltà tal-fornitur tal-magna li jiżgura li l-utent ikun konxju dwar kwalunkwe perikli involuti fit-tħaddim, inklużi dawk imsemmija fid-dokumentazzjoni tal-prodotti Renishaw, u li jiżgura li jkun hemm protezzjoni u interlocks tas-sigurtà adegwati pprovduti.

Taħt ċerti ċirkustanzi, is-sinjali tas-sonda jista' jindika b'mod falz kundizzjoni probe-seated. Tiddependix fuq is-sinjali tas-sonda biex twaqqaf il-moviment tal-magna.

Jekk it-tagħmir jintuża b'mod li ma jkunx speċifikat mill-manifattur, il-protezzjoni pprovduta mit-tagħmir tista' titnaqqas.

Il-metodu mistenni ta' waqfien ta' emerġenza għal prodotti ta' Renishaw huwa billi jintefa l-iswiċċ li jforni l-elettriku lill-prodott.

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### NL - WAARSCHUWINGEN

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 bewerkingsmachines of CMM's worden gebruikt, wordt het dragen van een veiligheidsbril aanbevolen.

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

Schakel de stroom uit, voordat u onderhoudswerkzaamheden verricht.

Raadpleeg de bedieningshandleiding van de machineleverancier.

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 voor het stoppen van de machinebeweging.

Gebruik van deze apparatuur op een manier die de fabrikant niet voorgeschreven heeft, kan de bescherming door de apparatuur beperken.

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

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### PL - OSTRZEŻENIA

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 uważać na niespodziewane ruchy maszyny. 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.

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 maszyny 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 pewnych okolicznościach sygnał z sondy może błędnie wskazywać stan gotowości sondy. Nie należy zatrzymywać pracy maszyny polegając wyłącznie na sygnale z sondy.

Jeżeli wyposażenie jest użytkowane w inny sposób, niż określił to producent, zabezpieczenie zapewniane przez to wyposażenie może być osłabione.

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

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### PT - ATENÇÃO

Risco de beliscadura entre as peças em movimento e entre estas e as estáticas. Não segurar no cabeçote do apalpador durante os movimentos ou durante a troca manual do apalpador.

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

Em todas as aplicações que envolvam a utilização de máquinas-ferramenta e CMMs, é recomendada a utilização de proteção para os olhos.

Para instruções relativas à limpeza segura dos produtos Renishaw, consultar as informações sobre manutenção na respectiva documentação do produto.

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

Consultar as instruções de operação do fornecedor da máquina.

É da responsabilidade do fornecedor da máquina assegurar que o utilizador tem conhecimento de quaisquer perigos envolvidos no funcionamento, incluindo os mencionados na documentação do produto da Renishaw, e garantir que são fornecidas proteções e bloqueios de segurança.

Sob certas circunstâncias, o sinal do apalpador pode incorretamente indicar uma condição de não contato do apalpador. Não confie nos sinais do apalpador para parar o movimento da máquina.

Se o equipamento for utilizado de uma maneira não indicada pelo fabricante, a proteção disponibilizada pelo equipamento pode ficar comprometida.

O método esperado para permitir uma parada de emergência dos produtos Renishaw é o de desligar a alimentação.

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### RO - ATENȚIONĂRI

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. O usuário deve permanecer fora da área de trabalho das combinações de cabeçote / extensão / apalpador.

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

Para instruções relativas à limpeza segura dos produtos Renishaw, consultar as informações sobre manutenção na respectiva documentação do produto.

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

Consultați instrucțiunile de operare livrate de furnizorul mașinii.

Furnizorul mașinii este responsabil să asigure că utilizatorul cunoaște pericolele pe care le presupune operarea mașinii, inclusiv cele menționate în documentația produsului Renishaw, și să asigure că sunt furnizate dispozitivele de blocare și de protecție corespunzătoare.

Sob certas circunstâncias, o sinal do apalpador pode incorretamente indicar uma condição de não contato do apalpador. Não confie nos sinais do apalpador para parar o movimento da máquina.

Dacă echipamentul este folosit în alte condiții decât cele specificate de producător, gradul de siguranță oferit de acesta poate fi diminuat.

O método esperado para permitir uma parada de emergência dos produtos Renishaw é o de desligar a alimentação.

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### SK - VÝSTRAHY

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

Dávajte 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.

Pokyny týkajúce sa bezpečného čistenia produktov spoločnosti Renishaw získate v informáciách o údržbe uvedených v dokumentácii k 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 výrobku spoločnosti Renishaw, a zaručiť poskytnutie adekvátnych zábran a bezpečnostných blokovacích poistiek.

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

Ak sa zariadenie používa spôsobom, ktorý nešpecifikoval výrobca, môže to negatívne ovplyvniť ochranu poskytovanú zariadením.

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

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### SL - OPOZORILA

Nevarnost stiska med premikajočimi se deli oziroma med premikajočimi se in statičnimi deli. Ne držite merilne glave med premiki ali ko ročno menjavate glavo.

Bodite pozorni na nepričakovane premike. Zadržujte se zunaj delovnega območja merilne glave/podaljška/kombinacij merilne glave.

Pri vsaki uporabi obdelovalnih strojev ali koordinatnih merilnih strojev priporočamo uporabo zaščitnih očal.

O varnem čiščenju izdelkov Renishaw si preberite razdelek Vzdrževanje v pripadajoči dokumentaciji.

Pred začetkom vzdrževanja stroj izklopite iz električnega omrežja.

Držite se navodil dobavitelja stroja.

Odgovornost dobavitelja stroja je, da uporabnika opozori na vse nevarnosti pri delovanju, tudi na tiste, ki so navedene v dokumentaciji Renishaw, in da zagotovi vsa potrebna varovala in varnostne zapore.

V določenih pogojih lahko signal glave lažno nakazuje, da je glava spravljena. Ne zanašajte se na signale glave za ustavitev gibanja stroja.

Drugačna uporaba opreme, kot jo je predpisal proizvajalec, lahko povzroči izpad zaščitnih funkcij opreme.

Predvidena metoda za zaustavitev izdelkov Renishaw v sili je izklop električnega napajanja.

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### SV - VARNINGAR

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.

Se underhållsinformationen i relevant produktdokumentation för instruktioner angående säker rengöring av Renishaws produkter.

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. Não confie nos sinais do apalpador para parar o movimento da máquina.

Om utrustningen används på ett sätt som inte tillverkaren har avsett kanske skyddet fungerar sämre.

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



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### ZH-TW - 警告

行走移動零件之間以及行走移動零件與靜止零件之間存在夾傷的危險。在移動時或手工更動換測頭時，切勿握住測頭座。

謹防意外移動。使用者位置應保持在測頭座／延長桿／測頭組合件的整個工作包覆面以外。

在所有涉及使用工具機或三次元量床的應用中，建議要有眼睛保護措施。

有關 Renishaw 公司產品的安全清潔指示，請參見相關產品說明書的維護資訊。

執行任何維修工作前，請先關閉總電源。

請參閱機器供應商的操作指南。

機器供應商有責任確保使用者瞭解操作機器所存在的任何危險，包括 Renishaw 產品說明書中提及之情況，並保證提供充分的安全防護罩和安全聯鎖裝置。

在某些情況下，測頭的顯示信號可能錯誤表示測頭已就位。切勿單憑測頭訊號來停止機器的行程移動。

如果裝置使用方式與製造商要求的方式不符，則裝置提供的保護功能可能會減弱。

Renishaw 公司產品的緊急關機方法是關閉電源。

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### ZH - 警告

运动部件之间以及运动部件与静止部件之间存在夹伤危险。在移动时或手工更换测头时，切勿握住测头座。

谨防意外移动。用户应该保持在测座/加长杆/测头组合件的整个工作区以外。

在所有涉及使用机床或坐标测量机 (CMM) 的应用中，建议采取保护眼睛的措施。

有关雷尼绍产品的安全清洁的指示，请参阅相关产品说明书中的维护说明。

在执行任何维护作业之前，请先断开电源。

请参阅机床供应商的操作说明书。

机床制造商有责任确保用户了解操作中存在的任何危险(包括雷尼绍产品说明书中提到的危险)，并确保提供充分的防护装置和安全联锁装置。

在某些情况下，有误发测头已复位状态信号的可能。切勿单凭测头信号来停止机床运动。

如果设备使用方式与制造商要求的方式不符，则设备提供的保护功能可能会减弱。

紧急关闭雷尼绍产品的方法是断开电源。

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