

## SPA2-2 installation guide

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# SPA2-2 installation guide

Documentation part number: H-1000-5247-07-B



## SPA2-2 installation guide

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# SPA2-2 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
Packaging insert	Corrugated fibreboard	PAP	20
Plastic bags	Low density polyethylene bag	LDPE	4
Padded bag	Paper	PAP	21

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# SPA2-2 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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## UK declaration of conformity

Contact Renishaw plc or visit [www.renishaw.com/UKCMM](http://www.renishaw.com/UKCMM) for the full UK 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 (47CFR section 15.105)

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case you will be required to correct the interference at your own expense.

### Information to user (47CFR 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.

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### ICES-001 (Canada only)

This ISM device complies with Canadian ICES-001(A) / NMB-001(A).

Cet appareil ISM est conforme à la norme ICES-001(A) / NMB-001(A) du Canada.

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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.



### NRTL certification

The SPA2-2 product has been independently tested to the relevant requirements of the following standards:


- UL 61010-1:2012/ R:2016-04
- CAN/CSA-C22.2 No. 61010-1:2012/U2:2016-04

The NRTL TÜV SÜD certification mark demonstrates compliance with these requirements.


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# SPA2-2 safety

 Where this symbol is displayed on the product the user must refer to the installation guide for information and safety advice.


If the equipment is used in a manner not specified by the manufacturer then the safety of the equipment may be impaired.


 **WARNING:** The SPA2-2 must be earthed. Earthing provisions for the complete machine is the responsibility of the OEM or installer.

 **WARNING:** SPA2-2 is isolated from the power supply by disconnection of the ac power connector from 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 BS EN 61010-1:2010 (or current version) and any applicable national wiring regulations for the country of installation.

 **WARNING:** Maintenance should only be carried out after the machine has been isolated from the electrical supply, compressed air supply or other energy sources in accordance with the machine manufacturer's instructions.

## Machine safety

 **WARNING:** Switching off or isolating the SPA2-2 may NOT prevent unexpected machine movement. The user is advised to isolate the machine from the electricity supply, compressed air or other energy sources in accordance with the machine manufacturer's instructions before entering the danger zone or performing any maintenance operations.

 **CAUTION:** It is strongly recommended that the CMM manufacturer or retrofitter includes a periodic test of the emergency stop and if fitted, the associated reset switch in their maintenance instructions.

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# SPA2-2 international safety instructions

## BG - ПРЕДУПРЕЖДЕНИЕ

Моля, обърнете на приложение 1 и прочетете инструкциите за безопасност на вашия собствен език, преди за разопаковате 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.

## FR - AVERTISSEMENT

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

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### 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.

### HR - NAPOMENA

Prije nego što proizvod izvadite iz ambalaže i ugradite ga, otvorite Prilog 1 i pročitajte 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.

### PT - ADVERTÊNCIA

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



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### 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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# SPA2-2 environmental conditions

Indoor use	IP20 (no protection against water)*
Altitude	Up to 2000 m
Operating temperature	0 °C to +50 °C
Storage temperature	-25 °C to +70 °C
Relative humidity	80% maximum (non-condensing) for temperatures up to +31 °C Linear decrease to 50% at +40 °C
Transient overvoltages	Installation category II
Pollution degree	2
Maximum weight	9.48 kg (20.9 lb) (7-axis system)



\* **NOTE:** If a higher IP rating is required an additional external enclosure will be required to house the SPA2-2. This enclosure must enable the internal ambient temperature to remain within the SPA2-2 operating temperature range.

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# SPA2-2 references and associated documents

The following Renishaw documents are referred to in this document or may be a source of further relevant information. They can easily be acquired from Renishaw website [www.renishaw.com](http://www.renishaw.com).

## Renishaw documents

[Installation guide: UCC2](#)

[Installation guide: UCCLite-2 and UCCLite \(H-1000-5109\) - legacy](#)

[Installation guide: UCC BI](#)

[Installation guide: UCC S5 REVO-2 CMM controller \(H-1000-7598\)](#)

## External documents

National and international standards including the following may be applicable to the finished machine or installation:

- BS EN ISO 12100-2:2003\* (Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles and specifications)
- BS EN (IEC) 60204-1:2006\* (Safety of machinery - Electrical equipment of machines - Part 1: General requirements)

It is the responsibility of the OEM or installer to ensure that the finished installation complies with applicable national regulations for the country of installation.

\* Or current version.

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# SPA2-2 system description

The SPA2-2 is a digital servo power amplifier solution designed specifically for use with the Renishaw UCC BI brushless motor interface controller. It is capable of controlling up to seven axes of movement but is customer configurable to the requirements of the installation.

## Basic configurations

- SPA2-2 3-axis: This is the basic 3-axis configuration suitable for conventional CMMs fitted with brushed dc motors and brushless ac motors. It can accommodate tacho, tacholess and encoder velocity feedback systems. An additional card can be fitted to extend this unit to a 4-axis system.
- SPA2-2 6-axis: This configuration is suitable for installations requiring between 4 or 6 axis amplifiers. Like the 3-axis version it can accommodate tacho, tacholess and encoder velocity feedback systems. An additional axis card can be fitted to extend this unit to a 7-axis system.
- Two 3-axis SPA2-2 units can be combined in a single system permitting a servo power amplifier solution with an overall power rating of 1100 W.

## Configurable motor voltage

- The SPA2-2 motor voltage can be configured by software to support a wide range of motor voltages within the range of 12 V and 60 V. The current limit can also be configured up to a maximum of 5 A continuous, 10 A peak.
- The voltage setting of each axis is independent and therefore it is possible to have each machine motor driven by a different voltage.

## DC analogue tacho, tacholess or encoder compatibility

- Renishaw's UCC BI and SPA2-2 control solutions have the ability to support different types of velocity control loop based on the feedback to the controller.
- Three control loop feedback methods are integrated into the standard design of the system, these are analogue tacho based feedback system from the motor, obtaining the feedback from the scales of the CMM or from a motor mounted rotary encoder system.

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# System requirements

## Electrical requirements

The SPA2-2 is powered from the ac mains supply via a connector to IEC 60320/C14. The electrical ratings of the unit are as follows:


100 Vac - 240 Vac -15%, +10%	47 Hz to 63 Hz	750 W maximum
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Ensure that a suitable cable is always used that meet the requirements of the above operating conditions.


A standard IEC C13 cable assembly with a current rating of greater than 5 A must be used.

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.

Mains input connector	IEC C13 10 amp power connector
-----------------------	--------------------------------

 **NOTE:** Ensure the power cord meets the local electrical regulations.

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

 **NOTE:** An earth stud or thread is provided on all Renishaw controllers and amplifiers to allow bonding of the CMM metal parts to the protective earth. Connect all the Renishaw controller and amplifier earth points to the CMM frame.

The SPA2-2 is isolated from ac power by disconnecting the IEC mains connector on the rear panel. This should be sited within easy reach of the CMM operator. 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 disconnection device must meet the requirements of IEC 61010-1 and any national wiring regulations applicable in the country of installation.

The installer must ensure that adequate mains over-current protection is provided for the controller equipment (UCC and SPA). See the electrical requirements sections of the appropriate installation guides. This must be in accordance with any national wiring regulations applicable in the country of installation.

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# SPA2-2 system components

A number of kits exist which contain the necessary components required to connect the SPA2-2 onto a CMM.

## Motor connectors

There are two types of motor connectors:

- dc brushed motor connectors
- ac brushless motor connectors

Ensure the kit contains the appropriate connector for the installation.



**NOTE:** This connector is of the solder bucket variety, it is recommended that they are fitted to the CMM wiring by a competent technician or engineer, and that sleeving is used for all connections to reduce the possibility of short circuits.

Each of the three connector assemblies consist of the following:

- 1 off metal backshell
- 1 off 7W2 power and signal 'D' type plug
- 2 off power pins

## Emergency stop and reset switch (supplied)



**NOTE:** The emergency stop function of the SPA2-2 can be used as part of a Performance Level B system as per EN ISO13849-1:2015 (or current version). To meet a higher performance level an external safety system must be fitted.

Each kit contains one 9-way D-type socket that permits the installer to add additional emergency stop devices to the emergency stop system integrated within the SPA2-2.



**NOTE:** Emergency stop switches (where required by the manufacturer or installer's risk assessment) must comply with the requirements of standards UL1054/EN60947.

This connector is of the solder bucket variety. It is recommended that they are fitted to the CMM wiring by a competent technician or engineer, and that sleeving is used for all connections to reduce the possibility of short circuits.

The SPA2-2 range of products is capable of being configured to enable support of a wide range of motor and tacho feedback giving compatibility with most machine constructions.

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Part number	Description	Number of axis supported	Refer to
A-5402-8302	SPA2-2 3-axis DC motor kit	3	SPA2-2 dc motor kits
A-5402-8622	SPA2-2 6-axis DC motor kit	6	SPA2-2 dc motor kits
A-5402-3580	SPA2-2 DC motor connector kit	3	SPA2-2 dc motor connector kit
A-5402-8103	SPA2-2 4th axis interface card kit	1	SPA2-2 4th axis interface card kit
A-5121-0011	Dual SPA2-2 integration kit	6	Dual SPA2-2 integration kit
A-5121-0028	SPA DC connector kit	3	SPA2-2 dc connector kit

### SPA2-2 4th axis interface card kit

This kit contains the optional 4th axis interface card for the SPA2-2 system. This permits connection of an additional machine axis to the SPA2-2 when using the UCC BI controller.



**NOTE:** Each SPA2-2 unit can only support one 4th axis interface card.

This kit contains the following components:

- 1 off 4th axis interface card
- 1 off internal connection signal loom
- 1 off internal connection power loom
- 4th axis hardware mounting kit
- 1 off mating motor connector for machine wiring

### Dual SPA2-2 integration kit

This cable kit is designed to permit a high power solution for CMM installations where the power capacity of a single SPA2-2 will not address the requirements for the machine.

This system enables two SPA2-2 units to be combined as a single system and configured to drive the CMM installation. For example; if required, a single SPA2-2 can power a single axis, or if in a dual drive configuration the two dual axis motors can be supplied from separate SPA2-2 units and the other two axes to be integrated such that each SPA2-2 drives two motors.

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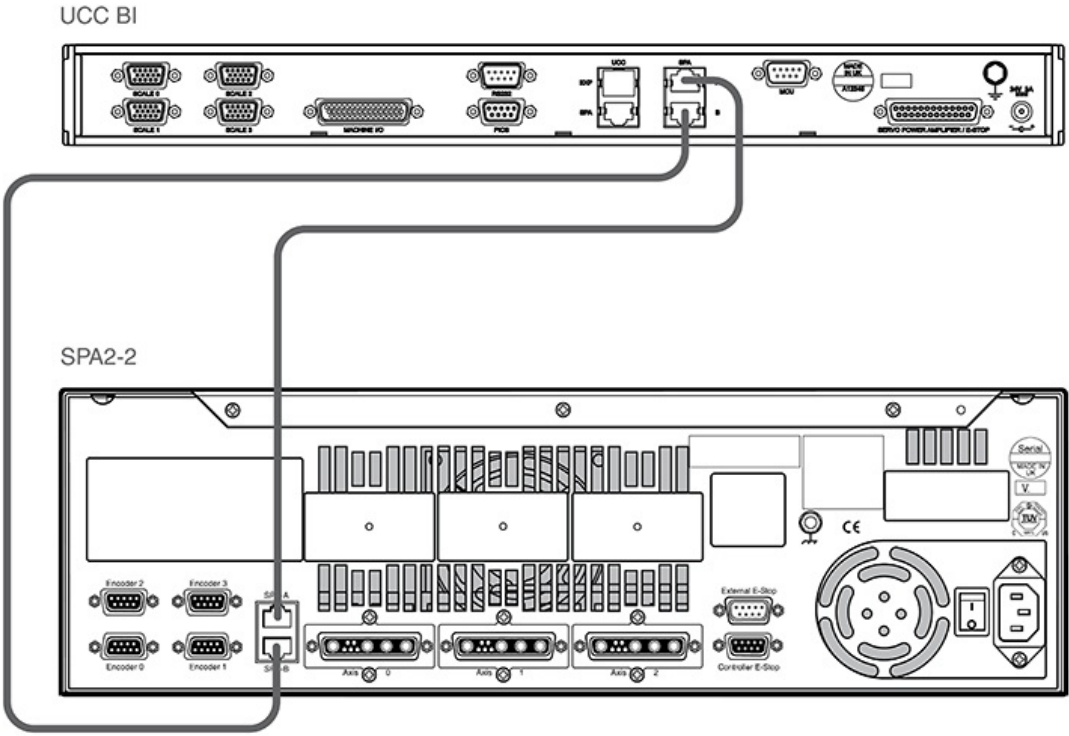
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## SPA2-2 comms connection

The comms link between the UCC BI and the SPA2-2 is made using two RJ45 cables (P-CA82-0017) provided in the SPA2-2 kit.

- The UCC BI port SPA-A should be connected to the SPA2-2 port SPA-A
- The UCC BI port SPA-B should be connected to the SPA2-2 port SPA-B

If the provided RJ45 cables are not used then the cables should be no longer than 400 mm in length, CAT 5E and shielded.



**i** **NOTE:** If 4th axis is required, the SPA2-2 will require the daughtercard interface kit: A-5402-8103.

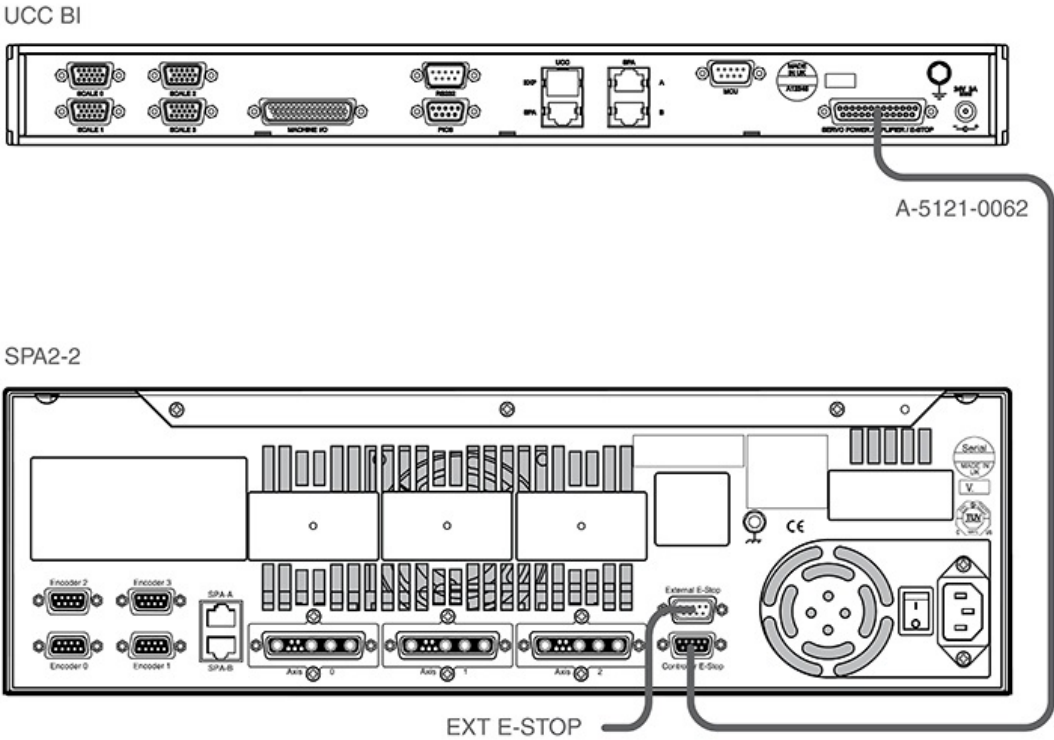


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## UCC BI to SPA2-2 emergency stop connection

**NOTE:** The connection between the UCC BI's servo power amplifier socket and the SPA2-2's controller E-STOP plug is made by cable A-5121-0062. This cable is provided with the SPA2-2 (A-5402-8300).



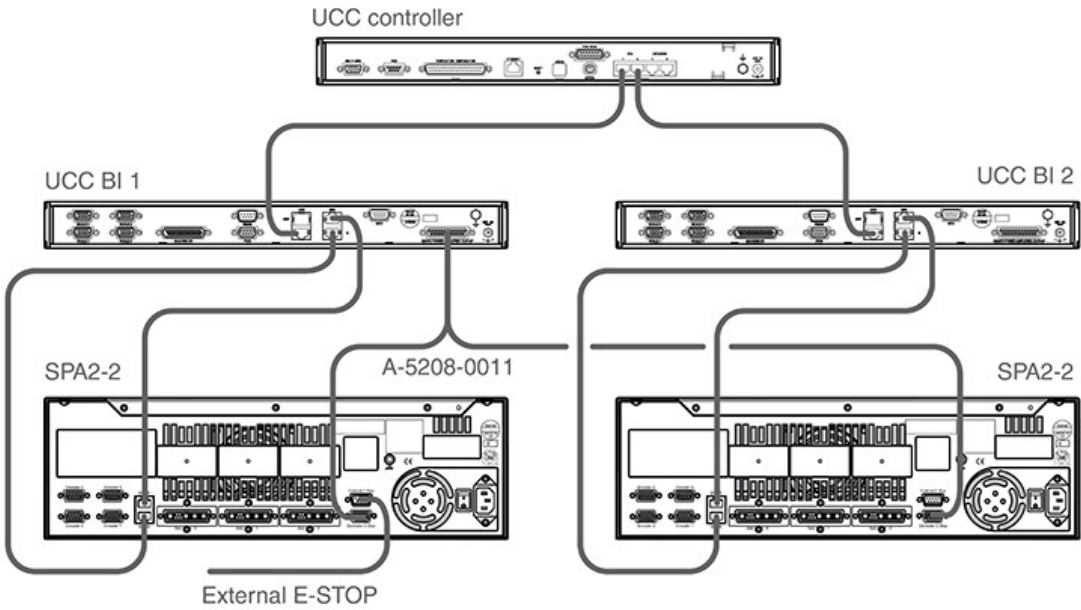
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## Dual UCC BI interconnection

Dual UCC BI installations require a special E-STOP cable (part number A-5208-0011). This cable has three tails, all marked with their function, and must be installed as per the diagram below.

MCU, RS232, PICS, servo power amplifier / E-STOP cable and machine I/O should be connected to UCC BI 1.



**NOTE:** E-STOP cable (A-5208-0011) is supplied only with the SPA2-2 dual, DC, and linear kits.

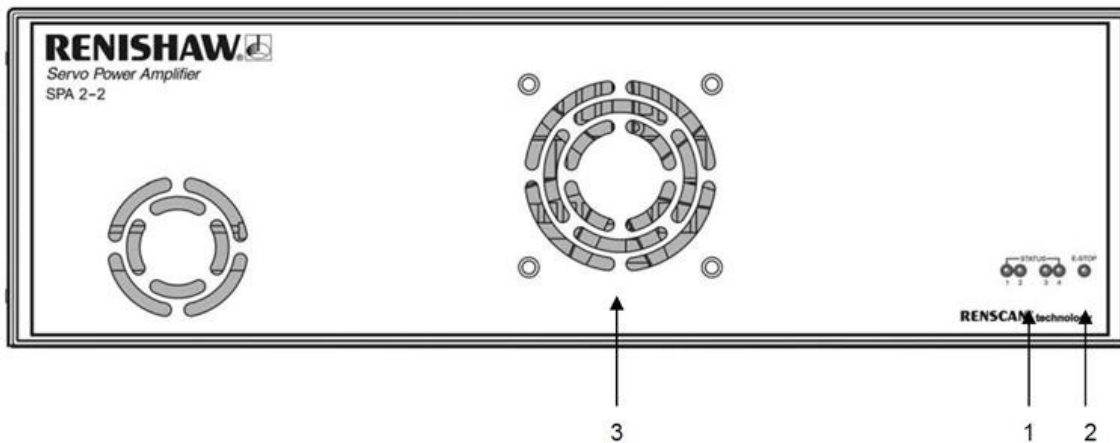
**CAUTION:** The capability to use the UCC BI in a dual SPA system is not yet available, please contact CMM support for further information.

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# Front panel description

The diagram below shows the front panel of the SPA2-2:



Key:	
1	Axes status LEDs
2	E-STOP LED
3	Air cooling fan inlet

## LED positions and axis link 3-axis / 6-axis

These LEDs indicate the status of the servo engagement within the SPA2-2 unit as shown in the table below:

Axis status LED colour	System status
Off	The SPA2-2 has no power being applied to the system or these axes are not fitted.
Orange	The servo system is active but not engaged for this axis.
Green	The servo system is engaged for this axis.
Red	There is a fault on this axis of the system.

Status 1 indicates the status of axis 0 and 1, status 2 indicates the status of axis 2 and 3 (if fitted), status 3 indicates the status of axis 4 and 5 of a 6 axis system and status 4 indicates the status of axis 6.

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### E-STOP LED

This red LED indicates if the emergency stop system has been activated.

### Air cooling fan inlet

The SPA2-2 requires air cooling, the inlet being through this fan.

The airflow to the fan must not be obstructed. A minimum of 50 mm clearance in front of the fan is required.

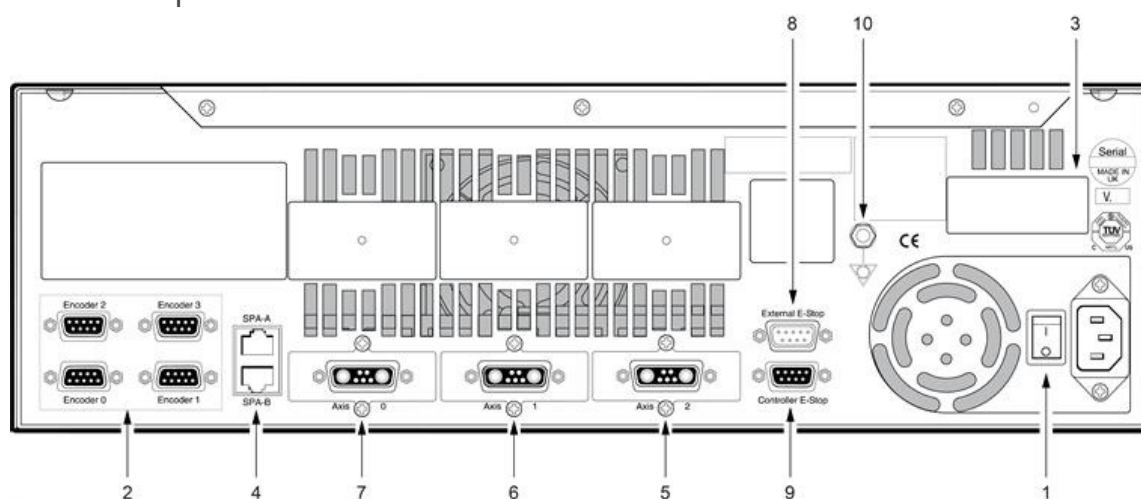
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# Rear panel description

When the SPA2-2 is delivered it will be in a configurable format and it will be necessary for the motor connection cards to be fitted by the installer prior to applying power.

## 3-axis system rear panel



Key	Description	Refer to section
1	Power input and ON / OFF switch	-
2	Axis 0 - 3 encoder tacho input connectors	Encoder connectors
3	Axis 3 motor input connector (optional)	Motor connector
4	UCC BI communication link connectors	SPA, -A, -B, -C, -D connections
5	Axis 2 motor input connector	Motor connector
6	Axis 1 motor input connector	Motor connector
7	Axis 0 motor input connector	Motor connector
8	External emergency stop and reset connector	External emergency stop connection
9	UCC BI emergency stop connector	Controller emergency stop connection
10	Earth stud	Electrical requirements

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# Connections

## Encoder connectors

The encoder interfaces are a machine installer configurable option, they permit the connection of digital encoders to the SPA2-2 or UCC BI system to provide motor feedback for inclusion into the machines control loop.

For further details on these connections please refer to 'Encoder interface' section.

## Motor connector

These connections are used for the dc motor connector kit placement or brushless motor.

Axis position 3 is for the additional axis interface card that can be fitted by the machine installer to the SPA2-2 unit.

For further details on these connections please refer to 'Motor connectors' section.

## Controller E-STOP connection

This 9-way 'D' connector links the emergency stop system between the SPA2-2 and the UCC BI controller, the necessary cable for this connection is supplied within the SPA2-2 kit.

## SPA, -A, -B, -C, -D connections

These RJ45 connections permit the dedicated servo system communication link between the SPA2-2 and the UCC BI controller for an effective control system.



**NOTE:** Connections A and B are used for a three or four axis SPA2-2 system, connections C and D are only used when a six or seven axis system is contained within a single box. Refer to 'Interconnection schemes' section for further details.

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### External emergency stop connection

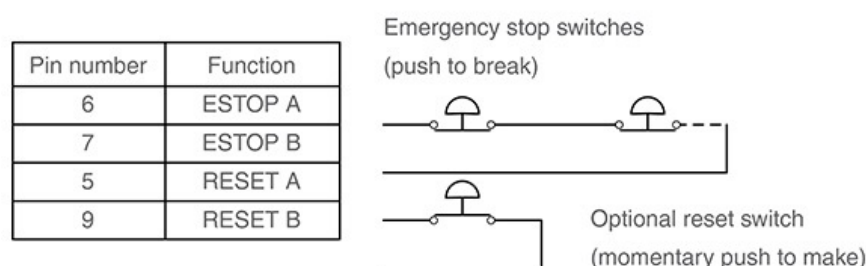
This 9-pin D-type connection is designed to permit connection of external emergency stop devices to the Renishaw controller emergency stop system.

The machine manufacturer or product installer must perform a risk assessment to determine the requirements for emergency stopping, emergency switching off and location of their actuating devices.



**NOTE:** The emergency stop function of the SPA2-2 can be used as part of a Performance Level B system as per EN ISO13849-1:2015 (or current version).  
To meet a higher performance level an external safety system must be fitted.

There are four connection pins available on this connector as shown below:



A manual reset button (refer to BS EN ISO13849-1:2015 (or current version) para. 5.2.2.) shall be included in the emergency stop system when required by the user's risk assessment. A reset switch may be needed when there is limited visibility of the danger zone from the machine's control position.

Reset switches must be located with full visibility of the danger zone and shall be sited outside the danger zone.

Any emergency stop device added to the E-STOP chain must have an electrical rating of at least 24 V 1 A and meet the requirements of BS EN ISO 13850:2015 (or current version).

The emergency stop device shall have direct opening action with mechanical latching. The emergency stop devices shall have a RED knob with a YELLOW collar and comply with BS EN 60947-5-5:1998+A2:2017 (or current version).



**NOTE:** If the emergency stop reset function is not required then it will be necessary to connect pins 5 and 9 so that when an emergency stop is removed from the system, it will automatically reset. If there are no additional emergency stop devices to be added to a UCC2 or UCC BI controller system, connect pins 6 and 7 to permit the MCU emergency stop switch to function. All connections to the bypass plug shall be fitted by an electrically competent person and all wires are to be sleeved.



**CAUTION:** It is strongly recommended that the CMM manufacturer or retrofitter includes a periodic test of the emergency stop (and associated reset switch, if fitted) in the maintenance instructions.

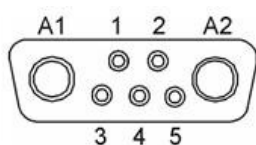
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# Motor connectors

## DC motor connection card termination

Each DC motor connection card presents a 7W2 connector for connection of a CMM motor to the SPA2-2, as shown below:



There are seven connections available on this connector. The table shows the connections and default polarity configurations for all pins.

Connector pin	Function
A1	+ve motor connection (default)
A2	-ve motor connection (default)
1	+ve tacho input (default)
2	-ve tacho input (default)
3	Ground reference
4	-ve tacho input (linked to pin 2)
5	Ground reference
Shell	Screen

**i** **NOTE:** The motor and tacho polarities on this connector are software configured during the SPA2-2 installation process.

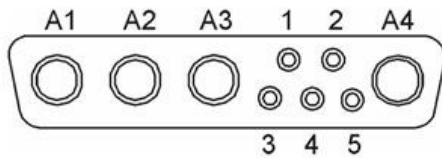
**!** **WARNING:** If the SPA2-2 is being integrated on a dual axes DCC driven machine it is essential that the motor polarities on the dual axes are the same.



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### Additional axis interface card termination and brushless motor cards



There are seven connections available on this connector. The table below shows the connections and default polarity configurations for all pins.

Connector pin	Function
A1	Phase 1 motor connection (default)
A2	Phase 2 motor connection (default)
A3	Phase 3 motor connection (default)
A4	Reserved for future expansion
1	+ve tacho input (default)
2	-ve tacho input (default)
3	ground reference
4	-ve tacho input (linked to pin 2)
5	ground reference
Shell	Screen



**WARNING:** Pins with the function reserved for future expansion must not be connected to any other system component. If the SPA2-2 is being integrated on a dual axes DCC driven machine it is essential that the motor polarities on the dual axes are the same.



**NOTE:** The motor and tacho polarities on this connector are software configured during the SPA2-2 installation process.

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# Encoder interface

The encoder interface offers four axes of encoder input to the SPA2-2 system, each being a 15-way high-density 'D' type connector, designed for digital tacho (encoder) input.

The encoder interface is designed to accept signals from an RS422 compliant encoder (maximum input frequency 20 MHz).



**NOTE:** Connection to single ended encoders is not recommended.

The 5 V supply from the encoder interface has the ability to supply a maximum of 1 A per axis pair.

For connection details please refer to the table below:

Connector pin	Function
1	Not connected
2	0 V (from SPA2-2)
3	Not connected
4	-Ref mark
5	-B signal
6	-A signal
7	+5 V supply from SPA2-2
8	+5 V supply from SPA2-2
9	0 V (from SPA2-2)
10	Not connected
11	Not connected
12	+Ref mark
13	+B signal
14	+A signal
15	0 V (from SPA2-2)
Shell	Screen

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# Hardware configuration

**CAUTION:** Connection to the protective bonding circuit: Provision for connecting the complete machine to the protective ground (earthing) is the responsibility of the manufacturer or equipment installer.



Isolation: The SPA2-2 is isolated by removing the mains connector. It is the responsibility of the equipment installer or user to fit additional means of isolation if indicated by risk assessment.

Earth fault / residual current protection: It is the responsibility of the machine manufacturer or product installer to ensure an adequate level of protection for the complete machine installation.

## Installation of motor connection cards



**NOTE:** It is assumed that this is the first installation process and that no mains supply is connected to the unit.

1. Remove the SPA2-2 from its transit packaging.
2. Place the SPA2-2 on a firm flat surface, with the front of the unit placed on the surface and the rear of the unit facing upward.
3. Remove the necessary connector protection covers from the rear of the SPA2-2. These are retained by spring clips and can be simply pulled out using the hole in the centre.
4. Remove a motor connection card from its packaging.
5. Align the motor connection card with the necessary axis connection position on the rear of the SPA2-2 and press the connector firmly into position (see below).



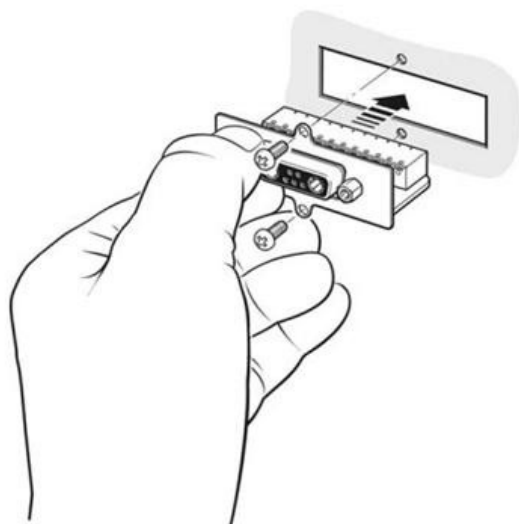
**CAUTION:** It is essential that each axis connector location should have either a connector blanking plate or a motor connector in place before the SPA2-2 is powered up.



**NOTE:** The motor connection card must be inserted into the SPA2-2 until its mounting plate is in contact with the rear panel of the SPA2-2.

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6. Using the screws provided, secure the motor connection card to the SPA2-2 rear panel.
7. Repeat steps 3 through 6 until all required motor connection cards are fitted.
8. If a 4th axis interface card is to be fitted proceed to the 'Installation of 4th axis card' section, or if a REVO connector card is to be fitted then proceed to the 'Installation of REVO™ connector card' section. Otherwise the unit can now be installed.

### Installation of 4th axis card

1. Place the SPA2-2 on a firm flat surface, with the base of the unit placed on the surface and the rear of the unit facing towards you.
2. Remove the four plastic bungs from the front of the side panels.
3. Remove the lid of the SPA2-2 enclosure by removing the three screws at the top of the rear panel and then lever the rear of the top panel upwards by inserting a screwdriver into the semi-circular cut out in the top of the rear panel. When the top panel is clear of the rear panel, pull the top panel towards you to release the front clips. The top panel can now be lifted off. Retain the fixings.
4. Remove the necessary connector protection cover from the rear of the SPA2-2, this is retained by a spring and can simply be pushed out.
5. Remove the 4th axis card from its packaging.
6. Attach the communication and power cables that are supplied with the 4th axis option card to the motherboard (see below).

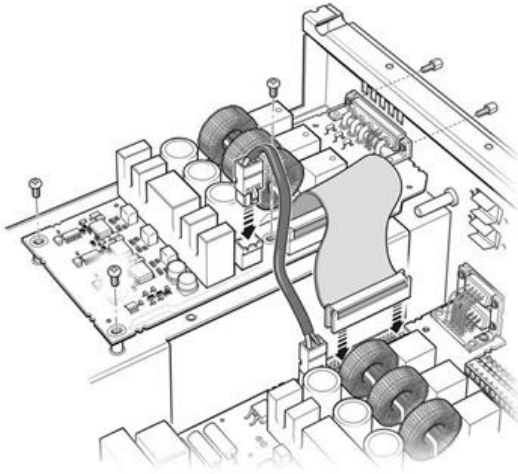


**NOTE:** If this interface card is being fitted to a 6-axis SPA2-2 then the communication and power cables will have already been installed on the lower motherboard. In this instance the cables supplied with the kit can be discarded.

7. Position the 4th axis card into its correct location, as shown below.

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8. Locate the 4th axis card onto the pillar mounts using the M3 screws supplied. Do not tighten these screws.
9. Using the jackscrews supplied, secure the 4th axis card connector through the location hole in the rear panel of the SPA2-2. Tighten the jackscrews (taking care not to overtighten) and then tighten the screws fitted in step 7.
10. Fit the communication cable attached to the SPA2-2 motherboard to the 4th axis interface card, as shown in the diagram above.
11. Fit the voltage supply cable loom from the SPA2-2 to the 4th axis option card, as shown in the diagram above.
12. Refit the lid by reversing the procedure in step 3 and replace the plastic bungs.

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# Fitting SPA2-2 into a 19" rack

The SPA2-2 can be used as a stand alone unit or installed into a 19" rack system. In either case, it shall be located and mounted so as to facilitate its accessibility and maintenance, and maintenance of the machine and its associated equipment.

The dimensions of the SPA2-2 unit are:

- Width: 440 mm
- Height: 135 mm
- Depth: 330 mm

## Stand alone

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

## Mounting in a 19 in rack

To permit the SPA2-2 to be fitted into a 19 in enclosure, a 3U rack mounting kit (A-1333-0029) is required.



**NOTE:** The screws supplied with this kit are M5 × 6 mm countersink type. DO NOT replace with longer screws as damage could occur.

The following procedure is recommended to fit the rack mounting brackets to the SPA2-2:

1. Position the SPA2-2 on a firm flat surface, with either the left or right hand side of the unit placed on the surface and the front of the unit facing towards you.
2. Remove the blanking plugs from the side of the unit, there are two of these located top and bottom of the enclosure about 15mm from the front lip.
3. Remove the 3U rack mounting kit from its packaging and place one of the countersunk screws supplied through one of the rack mounting brackets.
4. Align this screw and mounting bracket assembly to the fixing holes in the side of the SPA2-2 enclosure and fit the screw. Do not tighten at this point.
5. Align the other fixing hole in the rack mounting bracket with the fixing hole in the side of the SPA2-2, and fit the other countersunk screw.
6. Tighten both screws to ensure a secure fixing.
7. Rotate the SPA2-2 such that the other side of the enclosure can be accessed and then repeat steps 2 to 6.

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# System installation

The SPA2-2 is configured by software settings stored within the unit and on the host PC. The setting of these configuration parameters is performed by using UCCassist-2 commissioning software.

The UCCassist-2 software contains a structured installation process to assist in the commissioning of the SPA2-2.



**CAUTION:** Do not power down the SPA2-2 when the parameters or firmware is being updated. This can cause an error that requires the unit to be returned to Renishaw.

## Testing and verification

The manufacturer of the finished machine, or the installer of the SPA2-2, is responsible for ensuring that the following test and verification procedures are performed to the appropriate standards on the complete installation:

- Verification that the electrical equipment is in compliance with the technical documentation
- Continuity of the protective bonding circuit
- Insulation resistance tests
- Voltage tests
- Protection against residual voltages
- Functional tests, particularly those related to safety

It is strongly recommended that the CMM manufacturer or retrofitter includes a periodic test of the emergency stop and, if fitted, the associated reset switch, in their maintenance instructions.

## SPA2-2 cable preparation

The cables for connecting the UCC controller and SPA2-2 to the host PC are provided with the controller and SPA kits. The OEM or retrofitter is responsible for the provision of the following cables:

- E-STOP / reset
- Axis motors
- Motor encoder (if appropriate)



**NOTE:** We strongly recommend that all cables are screened with a braided screen with a minimum of 70% coverage and that the screen is connected to the connector body. Connector backshells should be metal and connected to the screen.

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### E-STOP / reset

The external E-STOP connector is provided to allow connection of external E-STOP switches and a reset switch (see 'SPA2-2 connections' for further detail). For the circuit the maximum voltage is 24 V dc and the maximum current is 1 A. The cable size will depend on its length (see table below for our recommendations).

The current taken by the E-STOP can be up to 1 A.

Maximum current (Amps)	Maximum permitted Volt drop	Maximum length (metre)	Minimum CSA (mm <sup>2</sup> )	Minimum diameter (mm)	Nearest AWG size
1	2	10	0.09	0.33	27
1	2	20	0.17	0.47	24
1	2	40	0.34	0.66	21

### Axis motors

The axis motor connectors provide the power to the axis motors and, if appropriate, the motor tacho connections. For the SPA2-2 the maximum voltage is 60 Vdc and the peak current is 10 A. The actual peak current will be dependant on the size of motor fitted and how hard it needs to be driven, so cable sizes for 2 A, 5 A and 10 A are given in the table below.

The 3 motor connections can provide 5 A continuous and 10 A peak.

Maximum motor current (Amps)	Maximum permitted Volt drop *	Max length (metre)	Minimum CSA (mm <sup>2</sup> )	Minimum diameter (mm)	Nearest AWG size
2	2	10	0.17	0.47	24
2	2	20	0.34	0.66	21
2	2	40	0.69	0.94	18
5	2	10	0.43	0.74	20
5	2	20	0.86	1.05	17
5	2	40	1.72	1.48	14
10	2	10	0.86	1.05	17
10	2	20	1.72	1.48	14
10	2	40	3.44	2.09	11

\* This is just a suggested value. The machine design will determine the actual value.



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### Motor encoders

If the axis drive motors are fitted with rotary encoders as a method of speed control then these encoders will need to be connected to the SPA2-2 motor encoder connectors. The encoders are sensitive to supply voltage so the recommended maximum volt drop is only 0.25 V.

The encoder can typically take up to 500 mA.

Maximum current (Amps)	Maximum permitted Volt drop	Maximum length (metre)	Minimum CSA (mm <sup>2</sup> )	Minimum diameter (mm)	Nearest AWG size
0.5	0.25	10	0.34	0.66	21
0.5	0.25	20	0.69	0.94	18
0.5	0.25	40	1.38	1.32	15

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# Replacing an SPA2-2 unit

## Replacing a digital SPA unit

The SPA configuration file is held in memory in the SPA unit but every time it is updated a copy is placed in the 'machine folder' within the UCCsuite installation on the host computer.

- Before changing a SPA it is advisable to check that there is a '.SPA' configuration file in the appropriate machine folder, within the UCCsuite installation on the host computer.
- If the old SPA is still working a '.SPA' configuration file can be uploaded from it. Start UCCassist-2, connect to the UCC / SPA, then in the 'Utilities' section start the 'SPA Diagnostics' utility, in the configuration page click on 'upload parameters from SPA'; a '.SPA' file will then be placed in the machine file.

When a new SPA is installed the '.SPA' file from the previous SPA unit should be downloaded.

- Start UCCassist-2, connect to the UCC / SPA, then in the 'Utilities' section start the 'SPA Diagnostics' utility, in the configuration page check the 'SPA configuration file path' points to the '.SPA' file location then click on 'download parameters to SPA'. This will update the new SPA with the information from the previous one and the controller can be used without the need for re-tuning.
- If the old .SPA file is not available then the machine commissioning sequence will have to be re-run up to the 'configure for metrology' step.



**NOTE:** You will need to skip the 'Define machine volume' step to avoid invalidating the error map datum.

## Differences when changing from SPA2 to SPA2-2 or SPAlite

Other differences to be aware of when changing between SPA types are:-

- The 4th axis card for the SPA2-2 is different from the one for the SPA2 and cannot be interchanged, i.e. the 4th axis card must be correct one for the SPA type (the motor connections are the same on both so there is no problems on changing between SPA2 and SPA2-2 on an installation).
- The axis motor connectors are in a different order on the SPA2 than they are on the SPA2-2 and SPAlite. Looking on the back panel and reading from left to right, the axes are 0, 1, 2 on the SPA2-2 and SPAlite units, but 2, 1, 0 on the SPA2.

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# Appendix 1 - SPA2-2 international safety statements

BG - ПРЕДУПРЕЖДЕНИЕ	JA - 警告
CS - VÝSTRAHA	LT – ĮSPĖJIMAS
DA - ADVARSEL	LV – BRĪDINĀJUMS
DE - WARNHINWEIS	MT - TWISSIJA
EL - ΠΡΟΕΙΔΟΠΟΙΗΣΗ	NL - WAARSCHUWING
EN - WARNING	PL - OSTRZEŻENIE
ES - ADVERTENCIA	PT - ADVERTÊNCIA
ET - HOIATUS	RO - AVERTISMENT
FI - VAROITUKSIA	SK - VÝSTRAHA
FR - AVERTISSEMENT	SL - OPOZORILO
GA - RABHADH	SV - VARNING
HR - NAPOMENA	ZH-TW - 警告
HU – FIGYELMEZTETÉS	ZH - 警告
IT - AVVISO	


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# BG - Безопасност

 Когато върху продукта е показан този символ, потребителят трябва да направи справка с ръководството за инсталиране, за да получи информация и съвети относно безопасността.


Ако оборудването се използва по начин, който не е указан от производителя, тогава оборудването може да не е достатъчно безопасно.


 **ПРЕДУПРЕЖДЕНИЕ:** SPA2-2 трябва да се заземи. Осигуряването на условия за заземяване на комплектната машина е отговорност на производителя на оригиналното оборудване или монтажника.

 **ПРЕДУПРЕЖДЕНИЕ:** SPA2-2 се изолира от захранването чрез изключване на съединителя за променлив ток от задния панел. Ако са необходими допълнителни средства за изолиране, те трябва да бъдат определени и напасвани от производителя на машината или от монтажния специалист на изделието. Разединителят трябва да бъде разположен на леснодостъпно място за оператора на КИМ (координатно-измерителната машина) и да отговаря на изискванията на стандарта BS EN 61010-1:2010 (или на текущата му версия) и на всички приложими национални разпоредби за електрическите инсталации в страната, в която се монтира.

 **ПРЕДУПРЕЖДЕНИЕ:** Поддръжката трябва да се извършва само след като машината е изолирана от електрическото захранване, подаването на състен въздух или други източници на енергия в съответствие с инструкциите на производителя на машината.

## Безопасност на машината


 **ПРЕДУПРЕЖДЕНИЕ:** Изключването или изолирането на SPA2-2 НЕ може да предотврати неочаквано движение машина. На потребителя се препоръчва да изолира устройството от електрозахранването, източника на състен въздух или други източници на енергия в съответствие с инструкциите на производителя на машината, преди навлизане в опасната зона или извършване на някакви дейности по поддръжка.

 **ВНИМАНИЕ:** Силно се препоръчва СММ производителя или извършващия модернизацията да включат в техните инструкции за поддръжка периодичен тест на аварийния стоп, и ако има монтиран, на свързания нулиращ превключвател.


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# CS - Bezpečnost

 Pokud je na výrobku zobrazen tento symbol, musí uživatel vyhledat informace a bezpečnostní doporučení v instalační příručce.


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


 **UPOZORNĚNÍ:** Systém SPA2-2 musí být uzemněný. Za zajištění uzemnění celého stroje odpovídá výrobce OEM nebo ten, kdo ho instaluje.

 **VÝSTRAHA:** Odpojení přístroje SPA2-2 od napájení se provádí odpojením konektoru střídavého napájení ze zadního panelu. Pokud se vyžaduje dodatečné odpojení, upřesnění jeho specifikací i samotná montáž jsou povinnosti výrobce stroje nebo osoby zajišťující instalaci. Odpojovací prvek je nutné umístit v dosahu obsluhy souřadnicového měřicího stroje a v souladu s normou BS EN 61010-1:2010 (nebo její aktuální verzi) a všech příslušných státních předpisů pro zapojení v zemi instalace.

 **UPOZORNĚNÍ:** Údržbu lze provádět pouze po odpojení stroje od přívodu elektrického napájení, přívodu stlačeného vzduchu nebo jiných zdrojů energie v souladu s pokyny výrobce stroje.

## Bezpečnost stroje

 **UPOZORNĚNÍ:** Vypnutí nebo odpojení systému SPA2-2 NEMUSÍ zabránit nečekanému pohybu stroje. Uživatel se doporučuje odpojit stroj od elektrického napájení, přívodu stlačeného vzduchu nebo jiných zdrojů energie v souladu s pokyny výrobce stroje dříve, než vstoupí do nebezpečného prostoru nebo bude provádět jakékoliv činnosti údržby.

 **UPOZORNĚNÍ:** Důrazně doporučujeme, aby výrobce souřadnicového měřicího stroje nebo firma zabývající se dodatečnou montáží zahrnuli pravidelný test nouzového zastavení a aby zmínili příslušné resetovací tlačítko (je-li k dispozici) ve svých pokynech pro údržbu.

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# DA - Sikkerhed



Når dette symbol vises på produktet, skal brugeren rådføre sig med installationsvejledningen for at få oplysninger og sikkerhedsanvisninger.

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



**ADVARSEL:** SPA2-2 skal have jordforbindelse. Ansvaret for bestemmelserne om jordforbindelse for hele maskinen ligger hos OEM eller installatør.



**ADVARSEL:** SPA2-2 er isoleret fra strømforsyningen ved at frakoble vekselstrømsstikket fra bagpanelet. Hvis der er behov for yderligere isolering, skal det specificeres og monteres af maskinproducenten eller installatøren af produktet. Isolatoren skal placeres inden for nem rækkevidde af CMM-operatøren og overholde BS EN 61010-1:2010 (eller den aktuelle version) og alle gældende nationale regler for ledningsføring i installationslandet.



**ADVARSEL:** Vedligeholdelse må kun udføres, når maskinen er isoleret fra elforsyningen, tryklufttilførslen eller andre energikilder i overensstemmelse med maskinproducentens anvisninger.

## Maskinsikkerhed



**ADVARSEL:** Slukning eller isolation af SPA2-2 forhindrer muligvis IKKE uventet bevægelse af maskinen. Det anbefales at brugeren isolerer maskinen fra elforsyningen, tryklufttilførslen eller andre energikilder i overensstemmelse med maskinproducentens anvisninger, før vedkommende går ind i en farezone eller udfører nogen form for vedligeholdelse.



**FORSIGTIG:** Det anbefales på det kraftigste, at CMM-producenten eller den, der eftermonterer, inkluderer periodisk test af nødstopet og, hvis monteret, den tilknyttede nulstillingskontakt i vedligeholdelsesanvisningerne.

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# DE - Sicherheitshinweise



Wenn dieses Symbol auf dem Produkt abgebildet ist, muss der Anwender die Informationen und Sicherheitshinweise des Benutzerhandbuchs beachten.

Eine von den vom Hersteller vorgegebenen Verwendungszwecken abweichende Nutzung könnte die Sicherheit des Geräts beeinträchtigen.



**WARNHINWEIS:** Der SPA2-2 muss geerdet sein. Für die Erdung der kompletten Maschine ist der Maschinenhersteller bzw. Installationstechniker verantwortlich.



**WARNHINWEIS:** Das SPA2-2 wird von der Stromversorgung isoliert, indem der Netzanschluss auf der Rückseite getrennt wird. Wenn eine zusätzliche Isolierung erforderlich ist, muss diese vom Hersteller der Maschine oder vom Installateur des Produkts angegeben und angebracht werden. Der Isolator muss in Reichweite des KMG-Bedieners aufgestellt werden und der Norm BS EN 61010-1:2010 (oder der aktuellen Version) sowie den geltenden nationalen Verdrahtungsvorschriften des Installationslandes entsprechen.



**WARNHINWEIS:** Vor der Durchführung von Wartungsarbeiten ist das KMG von der Stromversorgung, der Druckluftversorgung oder anderen Energiequellen gemäß der Herstelleranweisung zu trennen.

## Maschinensicherheit



**WARNHINWEIS:** Das Abschalten des SPA2-2 oder Trennen von der Spannungsversorgung ist KEIN Schutz vor unerwarteten Maschinenbewegungen. Der Bediener sollte, gemäß der Herstelleranweisung, die Stromversorgung, Druckluft und andere Energiequellen der Maschine trennen, bevor er die Gefahrenzone betritt bzw. Wartungsarbeiten durchführt.




**ACHTUNG:** Es wird dringend empfohlen, dass der KMG-Hersteller oder Nachrüstbetrieb eine regelmäßige Überprüfung der Notaus-Vorrichtung und des zugehörigen Reset-Schalters (falls vorhanden) in ihren Wartungsanweisungen vorsehen.


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# ΕΛ - Ασφάλεια

 Για όποιο σημείο εμφανίζεται αυτό το σύμβολο επάνω στο προϊόν, ο χρήστης πρέπει να ανατρέχει στον οδηγό εγκατάστασης για πληροφορίες και για συμβουλές ασφαλείας.


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


 **ΠΡΟΣΟΧΗ:** Η παροχή γείωσης για ολόκληρο το μηχάνημα είναι ευθύνη του Κατασκευαστή αρχικού εξοπλισμού ή του εγκαταστάτη.

 **ΠΡΟΕΙΔΟΠΟΙΗΣΗ:** Το SPA2-2 απομονώνεται από την παροχή ισχύος με αποσύνδεση του φινι παροχής εναλλασσόμενου ρεύματος από τον πίσω πίνακα. Εάν απαιτούνται οποιαδήποτε συμπληρωματικά μέσα απομόνωσης, πρέπει αυτά να καθοριστούν και να τοποθετηθούν από τον κατασκευαστή του μηχανήματος ή τον εγκαταστάτη του προϊόντος. Ο απομονωτής πρέπει να τοποθετείται σε σημείο εύκολα προσβάσιμο από τον χειριστή του CMM και να συμμορφώνεται με το πρότυπο BS EN 61010-1:2010 (ή την τρέχουσα έκδοση) και με οποιουδήποτε εφαρμοστέους εθνικούς κανονισμούς ηλεκτρικών καλωδιώσεων για τη χώρα εγκατάστασης.

 **ΠΡΟΕΙΔΟΠΟΙΗΣΗ:** Η συντήρηση πρέπει να πραγματοποιείται μόνο μετά την απομόνωση του μηχανήματος από την ηλεκτρική παροχή, την παροχή πεπιεσμένου αέρα ή άλλες πηγές ενέργειας σύμφωνα με τις οδηγίες του κατασκευαστή του μηχανήματος.

## Ασφάλεια μηχανήματος

 **ΠΡΟΕΙΔΟΠΟΙΗΣΗ:** Η διακοπή ή απομόνωση του SPA2-2 ΔΕΝ μπορεί να εμποδίσει μη αναμενόμενη κίνηση του μηχανήματος. Συνιστάται στο χρήστη να απομονώνει το μηχάνημα από την ηλεκτρική τροφοδοσία, τον συμπιεσμένο αέρα ή άλλες πηγές ενέργειας σύμφωνα με τις οδηγίες του κατασκευαστή μηχανήματος, προτού εισέλθει στην επικίνδυνη ζώνη ή προτού διεξάγει οποιεσδήποτε εργασίες συντήρησης.


 **ΠΡΟΣΟΧΗ:** Συνιστάται αυστηρά ο κατασκευαστής ή η επιχείρηση μετεξοπλισμού του CMM να περιλαμβάνουν στις οδηγίες συντήρησης έναν περιοδικό έλεγχο του συστήματος σταματήματος έκτακτης ανάγκης και του αντίστοιχου διακόπτη ρύθμισης εάν έχει τοποθετηθεί.




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# EN - Safety

 Where this symbol is displayed on the product the user must refer to the installation guide for information and safety advice.


If the equipment is used in a manner not specified by the manufacturer then the safety of the equipment may be impaired.


 **WARNING:** The SPA2-2 must be earthed. Earthing provisions for the complete machine is the responsibility of the OEM or installer.

 **WARNING:** SPA2-2 is isolated from the power supply by disconnection of the ac power connector from 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 BS EN 61010-1:2010 (or current version) and any applicable national wiring regulations for the country of installation.

 **WARNING:** Maintenance should only be carried out after the machine has been isolated from the electrical supply, compressed air supply or other energy sources in accordance with the machine manufacturer's instructions.

## Machine safety

 **WARNING:** Switching off or isolating the SPA2-2 may NOT prevent unexpected machine movement. The user is advised to isolate the machine from the electricity supply, compressed air or other energy sources in accordance with the machine manufacturer's instructions before entering the danger zone or performing any maintenance operations.

 **CAUTION:** It is strongly recommended that the CMM manufacturer or retrofitter includes a periodic test of the emergency stop and if fitted, the associated reset switch in their maintenance instructions.

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# ES - Seguridad



Si aparece este símbolo en el producto, el usuario deberá consultar la guía de instalación para obtener más información y consejos sobre seguridad.

Si no se cumplen las indicaciones especificadas por el fabricante para la utilización del equipo, la seguridad de este puede verse afectada.



**ADVERTENCIA:** El SPA2-2 debe estar conectado a tierra. Las conexiones de toma a tierra necesarias para toda la máquina son responsabilidad del fabricante de la máquina o el instalador.



**ADVERTENCIA:** El SPA2-2 se aísla de la fuente de alimentación desconectando el conector de alimentación de CA del panel trasero. Si es necesario algún otro método de aislamiento adicional, debe especificarse e instalarse por el fabricante de la máquina o el instalador del producto. El aislador debe estar situado al alcance del operador de la CMM y cumplir la norma BS EN 61010-1:2010 (o la versión actual) y cualquier normativa nacional de cableado aplicable en el país de instalación.



**ADVERTENCIA:** El mantenimiento solo se debe llevar a cabo una vez que la máquina se haya aislado del suministro eléctrico o de aire comprimido, o de otras fuentes de energía, conforme a las instrucciones del fabricante.

## Seguridad de la máquina



**ADVERTENCIA:** Apagar o aislar el SPA2-2 NO evita necesariamente un movimiento imprevisto de la máquina. Para evitar movimientos imprevistos, el operario deberá desconectar la máquina de la toma eléctrica, el aire comprimido o cualquier otra fuente de energía, según las instrucciones del fabricante, antes de acceder a zonas peligrosas o realizar operaciones de mantenimiento.




**PRECAUCIÓN:** Se recomienda encarecidamente que el fabricante o el técnico de retrofit de la MMC incluya pruebas periódicas de parada de emergencia y, si está instalado, del interruptor de reinicio correspondiente en las instrucciones de mantenimiento.


## SPA2-2 installation guide

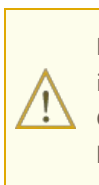
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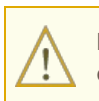
# ET - Ohutus

 Kui seadmel on kujutatud see sümbol, peab kasutaja lugema paigaldusjuhendit, et saada infot ja nõu turvalise käsitlemise kohta.

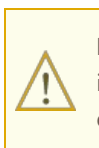
Kui seadet kasutatakse viisil, mida tootja ei ole ette näinud, võib seadme ohutus väheneda.


 **HOIATUS!** SPA2-2 tuleb maandada. Maandamisvõimaluste loomine masinale tervikuna on seadmete tootja või paigaldaja kohustus.

 **HOIATUS:** SPA2-2 on vooluvõrgust isoleeritud, lahutades vahelduvvoolu pistiku tagapaneelilt. Kui on vaja täiendavaid isolatsioonivahendeid, peab need kindlaks määrama ja paigaldama seadme tootja või toote paigaldaja. Isolaator peab paiknema CMMi operaatori käeulatuses ja vastama standardile BS EN 61010-1:2010 (või selle kehtivale versioonile) ja kõigile paigaldusriigis kehtivatele elektri-eeskirjadele.

 **HOIATUS!** Hooldust tohib teha alles pärast seda, kui masin on vastavalt masina tootja juhiste elektr-, suruõhu- või muudest energiaallikatest lahti ühendatud.

## Masina ohutus

 **HOIATUS!** SPA2-2 väljalülitamine või isoleerimine EI pruugi masina ootamatut liikumist ära hoida. Kasutajal soovitatakse isoleerida masin vooluvarustusest, suruõhust või teistest energiaallikatest masina tootja juhendi kohaselt enne, kui sisenetakse ohutsooni või asutakse tegema hooldustoiminguid.

 **ETTEVAATUST!** On rangelt soovitatav, et koordinaatmõõtemasina tootja või modifitseerija lisaks hooldusjuhendisse regulaarse hädaseiskamise ja olemasolul sellega seotud lähtestuslüli kontrolli.

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# FI - Turvallisuutta



Kun tuotteessa näkyy tämä symboli, käyttäjän tulee tutustua asennusoppaassa esittäviin lisätietoihin ja turvallisuusohjeisiin.

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



**VAROITUS:** SPA2-2 on maadoitettava. Koko koneen maadoituksen toteuttaminen on OEM-valmistajan tai asentajan vastuulla.



**VAROITUS:** SPA2-2 eristetään virtalähteestä irrottamalla vaihtovirtaliitin takapaneelista. Jos muita eristysmenetelmiä tarvitaan, koneen valmistajan tai tuotteen asentajan on määriteltävä ja asennettava ne. Eristin on asetettava niin, että CMM-koneen käyttäjä voi käyttää sitä helposti, ja sen tulee noudattaa sekä standardin BS EN 61010-1:2010 (tai sen voimassa olevan version) että asennusmaan sovellettavien kytkentäsäännösten vaatimuksia.



**VAROITUS:** Huolto tulee suorittaa vasta sen jälkeen, kun kone on eristetty sähkövirtalähteestä, paineilmalähteestä ja muista energialähteistä koneen valmistajan ohjeiden mukaisesti.

## Koneen turvallisuus



**VAROITUS:** SPA2-2-ohjaimen kytkeminen pois päältä tai eristäminen EI välttämättä estä odottamattomia koneen liikkeitä. Käyttäjää kehoitetaan eristämään kone sähkövirtalähteestä, paineilmalähteestä ja muista energialähteistä koneen valmistajan ohjeiden mukaisesti ennen kulkemista vaaralliselle alueelle tai huoltotehtävien suorittamista.



**VAROITUS:** On erittäin suositeltavaa, että CMM-valmistaja tai jälkiasentaja sisällyttää hätäpysäytinten ja mahdollisesti asennettujen nollauskytkinten säännöllisen testauksen huolto-ohjeisiinsa.

## SPA2-2 installation guide

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# FR - Sécurité



Lorsque ce symbole est affiché sur le produit, vous devez consulter le manuel d'installation qui contient des informations et des conseils de sécurité.

Si l'équipement est utilisé d'une façon contre-indiquée par le constructeur, la sécurité du matériel peut alors être compromise.



**AVERTISSEMENT** : Le SPA2-2 doit être mis à la terre. Il incombe à l'équipementier ou à l'installateur de prévoir une mise à la terre de toute la machine.



**AVERTISSEMENT** : Pour isoler la SPA2-2 de l'alimentation électrique, débranchez le connecteur secteur du panneau arrière. En cas de nécessité d'un moyen d'isolation supplémentaire, ce dernier doit être spécifié et installé par le fabricant de la machine ou l'installateur du produit. L'isolateur doit être placé à portée de main de l'opérateur de la MMT et être conforme à la norme NF EN 61010-1 (ou à la version actuelle) et à toute réglementation nationale applicable en matière de câblage dans le pays d'installation.



**AVERTISSEMENT** : Les interventions de maintenance ne peuvent avoir lieu qu'après avoir isolé la machine de l'alimentation électrique, de l'alimentation en air comprimé ou de toute autre source d'énergie, conformément aux instructions du constructeur de la machine.

## Sécurité machine



**AVERTISSEMENT** : Mettre le SPA2-2 hors tension ou l'isoler N'EXCLUE PAS des mouvements inattendus de la machine. Il est conseillé à l'utilisateur d'isoler celle-ci des alimentations électrique, d'air comprimé et d'autres sources d'énergie conformément aux instructions du constructeur de la machine avant de pénétrer dans la zone de danger ou de réaliser des opérations de maintenance.




**AVERTISSEMENT** : Il est fortement recommandé au constructeur de MMT ou à l'agent de retrofit d'inclure dans ses instructions de maintenance un test périodique de l'arrêt d'urgence et, s'il est installé, du bouton de réinitialisation associé.


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# GA - Sábháilteacht

 Nuair a thaispeántar an tsiombail seo ar an táirge, ní mór d'úsáideoir an táirge féachaint ar an treoir suiteála chun eolas agus comhairle sábháilteachta a fháil.


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


 **RABHADH:** Ní mór don SPA2-2 a bheith talmhaithe. Tá an OEM nó an suiteálaí freagrach as soláthraithe talmhaithe don mheaisín iomlán.

 **RABHADH:** Tá SPA2-2 leithlisithe ón soláthar cumhachta trí dhíscor an nascóra cumhachta SA ón bpainéal cúl. Má theastaíonn aon mhodh leithlisithe breise, ní mór do mhonaróir an mheaisín nó do shuiteálaí an táirge é a shonrú agus a fheistiú. Ní mór go mbeadh an leithliseoir suite sách gar don oibrítheoir CMM agus BS EN 61010-1:2010 (nó an leagan reatha) a chomhlíonadh agus aon rialachán sreangaithe náisiúnta don tír shuiteála.

 **RABHADH:** Níor cheart cothabháil a dhéanamh ach amháin tar éis an meaisín a bheith aonraithe ón soláthar leictreach, ón soláthar aeir comhbhrúite nó ó fhoinsí fuinnimh eile de réir threoracha déantúsóir an mheaisín.

## Sábháilteacht mheaisín

 **RABHADH:** Tá seans ann NACH gcoiscfeadh gluaiseacht an mheaisín gan choinne tríd an SPA2-2 a mhúchadh nó a aonrú. Moltar don úsáideoir an meaisín a aonrú ón soláthar leictreachais, ó aer comhbhrúite nó ó fhoinsí fuinnimh eile de réir threoracha ó dhéantúsóir an mheaisín sula dtéitear isteach sa chrios guaise nó sula ndéantar aon oibriúcháin chothabhála.

 **AIRE:** Moltar go láidir do dhéantúsóir an CMM nó don té a aisefheistíonn an CMM tástáil thréimhsiúil ar an stop éigeandála, agus ar an lasc athshocraithe a théann leis, más ann di, a áireamh sna threoracha cothabhála.

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# HR - Sigurnost



Tamo gdje je na proizvodu prikazan ovaj simbol, korisnik mora proučiti instalacijski vodič radi informacija i sigurnosnih savjeta.

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



**UPOZORENJE:** Uređaj SPA2-2 mora biti uzemljen. Izvođenje uzemljenja za cijeli stroj u nadležnosti je OEM-a ili instalatera.



**UPOZORENJE:** SPA2-2 se izolira od napajanja isključivanjem priključka za izmjeničnu struju sa stražnje strane ploče. Ako su potrebna dodatna sredstva za izolaciju, moraju se navesti i mora ih ugraditi proizvođač stroja ili onaj tko je montirao proizvod. Izolator mora biti smješten na dohvat ruke operatera CMM-a i mora biti u skladu s normom BS EN 61010-1:2010 (ili aktualnom verzijom) i svim mjerodavnim državnim propisima o ožičenju u državi u kojoj se provodi ugradnja.



**UPOZORENJE:** Održavanje se smije provoditi tek nakon što je stroj izoliran od električnog napajanja, dovoda komprimiranog zraka ili drugih izvora energije u skladu s uputama proizvođača stroja.

## Sigurnost stroja



**UPOZORENJE:** Isključenje ili izolacija uređaja SPA2-2 NE može spriječiti neočekivane pokrete stroja. Korisniku se savjetuje da prije ulaska u zonu opasnosti ili izvođenja radova održavanja stroj izolira od električnog napajanja, dovoda komprimiranog zraka ili drugih izvora energije u skladu s uputama proizvođača stroja.



**OPREZ:** Strogo se preporučuje da proizvođač CMM stroja ili izvođač retrofita u upute za održavanje uključi periodično testiranje sigurnosnog zaustavljanja te, ako je ugrađen, prekidača za resetiranje.

## SPA2-2 installation guide

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# HU - Biztonság



Amikor ezt a szimbólumot látja a terméken, akkor kérjük, tekintse meg a telepítési útmutatót további információkért és biztonsági ajánlásokért.

Ha a készüléket a gyártó által előírt módtól eltérő módon használják, akkor a készülék által nyújtott védelem csökkenhet.



**FIGYELMEZTETÉS:** Az SPA2-2 készüléket le kell földelni. A földelési előírások követése az eredetiberendezés-gyártó vagy a telepítést végző szakember felelőssége.



**FIGYELMEZTETÉS:** Az SPA2-2-t a hátsó panelen található váltakozó áramú tápcsatlakozó leválasztásával lehet leválasztani a tápellátásról. Ha egyéb leválasztásra lenne szükség, akkor azt a gép gyártójának vagy a termék beszerelőjének kell meghatározni és beszerelnie. A leválasztót a CMM kezelője számára könnyen elérhető helyen kell elhelyezni, és meg kell felelnie a BS EN 61010-1:2010 szabványnak (vagy az aktuális változatnak) és a telepítés országában érvényes nemzeti vezetékvezési előírásoknak.



**FIGYELMEZTETÉS:** A karbantartást kizárólag azután lehet elvégezni, hogy a gépet a gép gyártójának utasításai szerint leválasztották az elektromos hálózatról, a sűrítettlevegő-ellátásáról vagy az egyéb energiaforrásokról.

## Gépbiztonság



**FIGYELMEZTETÉS:** Az SPA2-2 készülék kikapcsolása vagy leválasztása NEM feltétlenül akadályozza meg a gép váratlan mozgását. A felhasználónak le kell választania a gépet az áramforrásról, a sűrítettlevegő-ellátásról és az egyéb energiaforrásokról a berendezés gyártójának előírásai szerint, mielőtt belépne a veszélyes területekre, illetve bármilyen karbantartási munkát végezne.




**FIGYELEM:** Kifejezetten javasoljuk, hogy a koordináta-mérőgép gyártója vagy az utólagos felszerelést végző kivitelező írja elő a vészleállító berendezés, illetve (amennyiben van ilyen) a hozzá tartozó visszaállító kapcsoló rendszeres ellenőrzését az általa összeállított karbantartási utasításokban.




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# IT - Sicurezza

 Se questo simbolo è riportato sul prodotto, consultare il manuale dell'utente per ottenere informazioni e consigli su un utilizzo sicuro.


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


 **AVVISO:** SPA2-2 deve essere messo a terra. La responsabilità di eseguire la messa a terra dell'intera macchina è a carico dell'OEM o dell'installatore.

 **AVVISO:** Il SPA2-2 viene isolato dall'alimentazione elettrica tramite la disconnessione del connettore di alimentazione CA dal pannello posteriore. Nel caso in cui fossero necessari ulteriori dispositivi di isolamento, sarà necessario specificare tale esigenza e richiedere al produttore della macchina o all'installatore di provvedere in tale senso. Il dispositivo di isolamento deve essere collocato a portata di mano dell'operatore di CMM ed essere conforme alla norma BS EN 61010-1:2010 (o versione attuale) e qualsiasi normativa nazionale in materia di cablaggio vigente nel Paese in cui verrà installato.

 **AVVISO:** qualsiasi operazione di manutenzione deve essere eseguita soltanto dopo che la macchina è stata scollegata dalla rete di alimentazione, dall'aria compressa o da altre fonti di energia, in conformità alle istruzioni del produttore.

## Sicurezza della macchina

 **AVVISO:** lo spegnimento di SPA2-2 o la disconnessione dall'alimentazione NON garantisce l'assenza di spostamenti imprevisti della macchina. Prima di accedere alla zona di pericolo o di eseguire operazioni di manutenzione, si consiglia di scollegare la macchina, oltre che dall'alimentazione elettrica, anche dall'aria compressa o da altre fonti di energia, in conformità alle istruzioni del produttore.

 **AVVERTENZA:** si consiglia caldamente di chiedere al produttore della CMM o a chi si occupa del retrofit di includere nel piano di manutenzione un test periodico dell'arresto di emergenza e del relativo switch (se installato).

## SPA2-2 installation guide

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# JA - 安全性



製品にこの記号が貼り付けられている場合は、取付ガイドの情報と安全に関する情報を参照してください。

本製品をメーカーが指定する方法以外で使用した場合、本製品の安全性が損なわれることがあります。



**警告:** SPA2-2 はアースに接続する必要があります。機械一式のアースの確保は、OEM または取付業者の責任に委ねられます。



**警告:** SPA2-2 は、リアパネルから AC 電源コネクタを外すことで電源供給を停止することができます。別途、電源供給の切断が必要な場合は、機械メーカーまたは取付業者が実施してください。ブレーカーは、CMM オペレータが簡単にアクセスできる場所に設置し、BS EN 61010-1:2010 (または最新版) および各国で定められている配線に関する規則に則り設置してください。



**警告:** 機械メーカーの指示に従って電源、圧縮エア、その他のエネルギー源から機械を切断した後でのみ、メンテナンスを実施してください。

## 機械の安全性



**警告:** SPA2-2 のスイッチを切ったり、電源を切断しても、機械が予期せず動くことがあります。ユーザーには、危険領域に入るか、メンテナンス作業を行う前に、電源、圧縮エア、その他のエネルギー源から機械を切断することが推奨されます。



**注意:** CMM メーカーまたは取付業者には、緊急停止システムと、対応するリセットスイッチが取り付けられている場合は、リセットスイッチの定期的なテストをメンテナンス手順に含めることが強く推奨されます。

## SPA2-2 installation guide

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# LT - Sauga



Kai ant gaminio rodomas šis simbolis, naudotojas privalo informacijos ir saugos rekomendacijų ieškoti įrengimo vadove.

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



**ĮSPĖJIMAS:** SPA2-2 turi būti įžemintas. Atsakomybė dėl viso įrenginio įžeminimo tenka originalios įrangos gamintojui arba montuotojui.



**ĮSPĖJIMAS:** SPA2-2 atjungiamas nuo maitinimo šaltinio, atjungus kintamosios srovės maitinimo jungtį galiniame skydelyje. Jei reikia papildomų izoliavimo priemonių, jas turi nurodyti ir įmontuoti mašinos gamintojas arba gaminio montuotojas. Izoliavimo priemonė turi būti įmontuota CMM operatoriui lengvai pasiekiamoje vietoje ir atitikti standartą BS EN 61010-1:2010 (arba naujausią versiją) bei visas šalyje, kurioje yra įmontuojama, galiojančias nacionalines elektros instaliacijos taisykles.



**ĮSPĖJIMAS:** techninė priežiūra turi būti atliekama po to, kai įrenginys yra izoliuojamas nuo elektros tinklo, suspausto oro tiekimo tinklo ar kitų energijos šaltinių pagal įrenginio gamintojo instrukcijas.

## Įrenginio sauga



**ĮSPĖJIMAS:** išjungus arba izoliavus SPA2-2, gali NEPAVYKTI išvengti netikėto įrenginio pajudėjimo. Naudotojui patariama pagal įrenginio gamintojo nurodymus izoliuoti įrenginį nuo elektros tinklo, suspausto oro arba kitų energijos šaltinių, paskui galima saugiai patekti į pavojaus zoną arba atlikti bet kokius techninės priežiūros darbus.



**ATSARGIAI!** labai rekomenduotina, kad CMM gamintojas arba modifikuotojas į savo techninės priežiūros instrukcijas įtrauktų periodinį avarinio sustabdymo sistemos testą ir susijusio paleidimo iš naujo jungiklio (jeigu toks yra) testą.

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# LV - Drošība



Ja uz izstrādājuma ir redzams šis simbols, lietotājam jāizlasa uzstādīšanas pamācībā norādītā informācija un padomi par drošību.

Ja iekārtu lieto neatbilstīgi ražotāja norādēm, iekārtas drošums var mazināties.



**BRĪDINĀJUMS:** SPA2-2 jāiezemē. Par pareizu visas iekārtas iezemēšanu ir atbildīgs tās ražotājs vai uzstādītājs.



**BRĪDINĀJUMS:** SPA2-2 tiek izolēts no barošanas avota, atvienojot maiņstrāvas savienotāju no aizmugurējā paneļa. Ja ir nepieciešami jebkādi papildu izolācijas līdzekļi, tie jānorāda un jāuzstāda iekārtas ražotājam vai izstrādājuma uzstādītājam. Izolators jānovieto CMM operatoram viegli sasniedzamā vietā, un tam jāatbilst standarta BS EN 61010-1:2010 prasībām (vai pašreizējai versijai) un visiem piemērojamiem valsts elektroinstalāciju uzstādīšanas noteikumiem.



**BRĪDINĀJUMS:** apkope jāveic pēc tam, kad iekārta ir atvienota no strāvas padeves, saspiesta gaisa padeves vai citiem enerģijas avotiem saskaņā ar iekārtas ražotāja instrukcijām.

## Ierīces drošība



**BRĪDINĀJUMS:** SPA2-2 izslēgšana vai atvienošana **NEGARANTĒ** to, ka ierīce neveiks neparedzētu kustību. Pirms ieiet paaugstinātās bīstamības zonā vai uzsākt apkopes darbus, lietotājam ieteicams saskaņā ar ražotāja instrukcijām atvienot ierīci no strāvas padeves, saspiesta gaisa vai citiem enerģijas avotiem.



**UZMANĪBU!** Koordinēto mērīšanas mašīnu ražotājam vai modernizēšanas speciālistam stingri ieteicams atbilstīgi apkopes instrukcijai regulāri pārbaudīt ārkārtas apturēšanas sistēmu un ar to saistīto atiestatīšanas slēdzi (ja uzstādīts).

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# MT - Sigurtà



Kull fejn jintwera dan is-simbolu fuq il-prodott, l-utent irid jirreferi għall-gwida tal-utent u l-gwida dwar l-installazzjoni għal informazzjoni u pariri dwar is-sigurtà.

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



**TWISSIJA:** SPA2-2 irid jiġi ertjat. Il-provvedimenti tal-earthing għall-magna sħiħa huma r-responsabbiltà tal-OEM jew tal-installatur.



**TWISSIJA:** SPA2-2 huwa iżolat mill-provvista tal-elettriku permezz tal-iskonnessjoni tal-konnettur tal-elettriku ac mill-panel ta' wara. Jekk ikun meħtieġ xi mezz addizzjonali ta' iżolament, dan irid jiġi speċifikat u mwaħħal mill-manifattur tal-magna jew mill-installatur tal-prodott. L-iżolatur irid ikun f'post li jista' faċilment jintlaħaq mill-operatur CMM u jrid ikun konformi mal-BS EN 61010-1:2010 (jew il-verżjoni attwali) u kwalunkwe regolament nazzjonali applikabbli dwar il-wiring għall-pajjiż tal-installazzjoni.



**TWISSIJA:** Il-manutenzjoni trid issir wara li l-magna tkun ġiet iżolata mill-provvista tad-dawl, il-provvista t'arja kompressa jew sorsi oħra ta' enerġija b'konformità mal-istruzzjonijiet tal-produuttur tal-magna.

## Sigurtà tal-magna



**TWISSIJA:** Li titfi jew li tiżola l-SPA2-2 jista' MA jipprevenix moviment mhux mistenni tal-magna. Hu rakkomandat li l-utent jiżola l-magna mill-provvista tad-dawl, minn arja kkompressa jew minn sorsi oħrajn ta' enerġija skont l-istruzzjonijiet tal-manifattur tal-magna qabel ma jidhrol fiż-żona ta' periklu jew qabel ma jwettaq kwalunkwe xogħol ta' manutenzjoni.



**ATTENZJONI:** Hu rakkomandat bil-qawwa li l-manifattur tas-CMM jew tar-retrofitter jinkludi test perjodiku ta' waqfien ta' emerġenza u jekk ikun fihom, ir-reset switch fl-istruzzjonijiet tagħhom tal-manutenzjoni.

## SPA2-2 installation guide

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# NL - Veiligheid



Wanneer dit symbool zich op het product bevindt, dient de gebruiker de installatiegids te raadplegen voor informatie en veiligheidsadvies.

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



**WAARSCHUWING:** De SPA2-2 moet worden geaard. Voor aardingsvoorzieningen voor de gehele machine is de OEM of installateur verantwoordelijk.



**WAARSCHUWING:** SPA2-2 wordt geïsoleerd van de voeding door de wisselstroomconnector los te koppelen van het achterpaneel. Als er extra isolatiemiddelen vereist zijn, moeten deze worden gespecificeerd en gemonteerd door de machinefabrikant of de installateur van het product. De isolator moet binnen handbereik van de CMM-operator worden geplaatst en conform zijn met BS EN 61010-1:2010 (of de huidige versie) en alle toepasselijke nationale bekabelingsvoorschriften voor het land van installatie.



**WAARSCHUWING:** Onderhoud mag alleen worden uitgevoerd nadat de machine is geïsoleerd van de elektrische voeding, persluchttoevoer of andere energiebronnen volgens de instructies van de machinefabrikant.

## Machinerveiligheid



**WAARSCHUWING:** De SPA2-2 uitschakelen of afsluiten is GEEN garantie tegen onverwachte machinebewegingen. De gebruiker wordt geadviseerd om de machine volgens de instructies van de machinefabrikant af te sluiten van de voedingsspanning, perslucht en andere energiebronnen, en pas daarna gevaarlijke gebieden te betreden of onderhoud te verrichten.




**WAARSCHUWING:** Voor de CMM-fabrikant of installateur is het sterk aan te raden om in zijn onderhoudsinstructies een periodieke test op te nemen van de noodstop en, indien aangebracht, de resetschakelaar daarvan.


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# PL - Bezpieczeństwo

 Jeżeli symbol ten znajduje się na produkcie, należy zapoznać się z podręcznikiem instalacji, aby uzyskać informacje i porady dotyczące bezpieczeństwa.


Jeżeli sprzęt jest użytkowany w inny sposób, niż określił to producent, działanie zabezpieczeń sprzętu może być ograniczone.


 **OSTRZEŻENIE:** Należy uziemić SPA2-2. Za zapewnienie warunków uziemienia całej maszyny jest odpowiedzialny producent maszyny lub instalator.

 **OSTRZEŻENIE:** W celu odizolowania SPA2-2 od zasilania należy odłączyć złącze zasilania prądem przemiennym (AC) od panelu tylnego. Jeśli wymagane są dodatkowe środki z zakresu odłączania, muszą one zostać określone i zamontowane przez producenta maszyny lub instalatora produktu. Odłącznik musi znajdować się w miejscu łatwo dostępnym dla operatora CMM i być zgodny z normą BS EN 61010-1:2010 (lub jej aktualną wersją) oraz wszelkimi przepisami krajowymi dotyczącymi okablowania obowiązującymi w kraju instalacji.

 **OSTRZEŻENIE:** Konserwację należy przeprowadzać tylko po odłączeniu maszyny od zasilania elektrycznego, sprężonego powietrza lub innych źródeł energii, zgodnie z instrukcjami producenta maszyny.

## Bezpieczeństwo maszyny

 **OSTRZEŻENIE:** Wyłączenie lub odizolowanie sterownika SPA2-2 może NIE zapobiec nieoczekiwanym ruchom maszyny. Zaleca się, aby przed wejściem do strefy niebezpiecznej lub wykonaniem jakichkolwiek czynności konserwacyjnych użytkownik odizolował maszynę od zasilania prądem elektrycznym, sprężonym powietrzem bądź od innych źródeł energii, zgodnie z zaleceniami producenta maszyny.

 **PRZESTROGA:** Zaleca się, aby producent lub firma montująca maszynę, załączył w swoich procedurach konserwacji okresowy test systemu awaryjnego i, jeśli zamontowano, przycisku reset.

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# PT - Segurança



Onde este símbolo é apresentado no produto, o utilizador deve consultar o guia de instalação para obter informações e dicas de segurança.

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



**AVISO:** O SPA2-2 deve ser ligado à terra. As disposições da ligação à terra para a máquina no seu âmbito são da responsabilidade do OEM ou do instalador.



**AVISO:** O SPA2-2 está isolado da alimentação, desligando o conector de alimentação CA do painel traseiro. Se forem necessários meios de isolamento adicionais, os mesmos terão de ser especificados e instalados pelo fabricante da máquina ou da entidade instaladora do produto. O isolador tem de ficar em local de fácil acesso do operador do CMM e estar em conformidade com a norma BS EN 61010-1:2010 (ou versão atual) e outros regulamentos de ligação nacionais relativos ao país de instalação.



**AVISO:** A manutenção deve apenas ser realizada após a máquina ter sido isolada da fonte de alimentação elétrica, fornecimento de ar comprimido ou de outras fontes de energia, de acordo com as instruções do fabricante da máquina.

## Segurança da máquina



**AVISO:** Desligar ou isolar o SPA2-2 pode NÃO impedir o movimento inesperado da máquina. É aconselhado ao utilizador que isole a máquina da fonte de alimentação elétrica, ar comprimido ou outras fontes de energia, de acordo com as instruções do fabricante da máquina antes de entrar na zona de perigo ou de realizar quaisquer operações de manutenção.




**ATENÇÃO:** É fortemente recomendado que o fabricante de CMM ou o responsável pelo reequipamento inclua um teste periódico da interrupção de emergência e, se instalado, o interruptor de reinício associado nas suas instruções de manutenção.




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# RO - Instrucțiuni de siguranță

 În cazul în care acest simbol este afișat pe produs, utilizatorul trebuie să consulte ghidul de instalare pentru informații și recomandări de securitate.


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


 **AVERTISMENT:** SPA2-2 trebuie să fie împământat. Împământarea întregii mașini este responsabilitatea OEM sau a instalatorului.

 **AVERTIZARE:** Separarea modului SPA2-2 de la alimentarea cu tensiune se realizează prin decuplarea conectorului de alimentare cu tensiune CA de la panoul din spate. Dacă sunt necesare mijloace suplimentare de separare, acestea trebuie specificate și instalate de producătorul mașinii sau de instalatorul produsului. Dispozitivul de separare trebuie amplasat la îndemâna operatorului CMM și trebuie să respecte standardul BS EN 61010-1:2010 (sau versiunea actuală) și orice reglementări naționale privind cablarea, aplicabile în țara de instalare.

 **AVERTISMENT:** Întreținerea trebuie efectuată numai după ce mașina a fost izolată față de alimentarea electrică, alimentarea cu aer comprimat sau alte surse de energie în conformitate cu instrucțiunile producătorului.

## Recomandări de siguranță


 **AVERTISMENT:** Oprirea sau izolarea dispozitivului SPA2-2 NU împiedică mișcările neprevăzute ale mașinii. Utilizatorului i se recomandă deconectarea mașinii de la sursa de energie electrică, sursa de aer comprimat și alte surse de energie, în conformitate cu instrucțiunile producătorului, înainte de a pătrunde în zona periculoasă sau de a efectua orice lucrări de întreținere.

 **ATENȚIE:** Se recomandă ca producătorul CMM sau cel care reabilitează sistemul să includă o testare periodică a opririi de urgență și dacă este instalat, o testare a butonului de resetare asociat în instrucțiunile de întreținere.


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# SK - Bezpečnosť

 Ak je uvedený na výrobku tento symbol, používateľ si musí prečítať informácie a bezpečnostné odporúčania v inštaláčnej a používateľskej príručke.


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


 **VÝSTRAHA:** Prístroj SPA2-2 musí byť uzemnený. Uzemnenie celého prístroja je zodpovednosťou pôvodného výrobcu zariadenia (OEM) alebo firmy vykonávajúcej inštaláciu.

 **VAROVANIE:** SPA2-2 je izolovaný od napájania odpojením AC napájacieho konektora zo zadného panela. Ak sú potrebné ďalšie prostriedky izolácie, musí ich špecifikovať a namontovať výrobca stroja alebo inštalátor produktu. Izolátor musí byť jednoducho prístupný pre obsluhu CMM zariadenia a musí byť v súlade s normou BS EN 61010-1:2010 (alebo aktuálnou verziou) a všetkými platnými vnútroštátnymi predpismi týkajúcimi sa elektroinštalácie v krajine inštalácie.

 **VÝSTRAHA:** Údržba sa smie vykonávať len vtedy, ak bol prístroj izolovaný od elektrického napájania, rozvodu stlačeného vzduchu alebo iných zdrojov energie v súlade s inštrukciami výrobcu prístroja.

## Bezpečnosť prístroja

 **VÝSTRAHA:** Vypnutie alebo izolácia zariadenia SPA2-2 NEMUSÍ zabrániť neočakávanému pohybu prístroja. Pred vstupom do nebezpečnej zóny alebo pred vykonaním ľubovoľných údržbových postupov sa používateľovi odporúča izolovať prístroj od zdroja elektrickej energie, stlačeného vzduchu alebo iných zdrojov energie v súlade s pokynmi výrobcu prístroja.

 **UPOZORNENIE:** Dôrazne sa odporúča, aby výrobca súradnicového meracieho prístroja (CMM) alebo firma vykonávajúca jeho inštaláciu zahrnuli do ich údržbových pokynov pravidelné testovanie núdzového vypnutia a príslušného resetovacieho spínača, ak je namontovaný.

## SPA2-2 installation guide

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# SL - Varnost



Če je na izdelku nameščen ta simbol, mora uporabnik upoštevati informacije in nasvete glede varnosti v navodilih za namestitev.

Drugačna uporaba opreme, kot jo je predpisal proizvajalec, lahko poslabša varnost opreme.



**OPOZORILO:** SPA2-2 je treba ozemljiti. Ozemljitev celotnega stroja je odgovornost proizvajalca originalne opreme ali inštalaterja.



**OPOZORILO:** SPA2-2 je izoliran od napajanja z odklopom napajalnega konektorja izmeničnega toka z zadnje plošče. Če so potrebni dodatni načini izolacije, jih mora določiti in namestiti proizvajalec stroja ali monter izdelka. Izolator mora biti nameščen na doseg uporabnika CMM in mora biti v skladu s standardom BS EN 61010-1:2010 (ali trenutno različico) in vsemi veljavnimi nacionalnimi predpisi o ožičenju za državo namestitve.



**OPOZORILO:** Vzdrževanje se lahko izvaja šele, ko je stroj ločen od električnega napajanja, dovajanja stisnjenega zraka ali drugih virov energije v skladu z navodili proizvajalca stroja.

## Varnost stroja



**OPOZORILO:** Izklop ali ločitev naprave SPA2-2 morda NE bo preprečila nepričakovanih premikov stroja. Uporabniku priporočamo, naj loči stroj od virov električnega napajanja, stisnjenega zraka in drugih virov energije v skladu z navodili proizvajalca stroja, preden vstopi v nevarno območje ali se loti vzdrževalnih del.



**POZOR:** Priporočamo, da proizvajalec KMS ali izvajalec naknadne vgradnje v navodilih za vzdrževanje predvidi tudi redne preskuse zaustavitve v sili in stikala za ponastavitev, če je vgrajeno.

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# SV - Säkerhet



När den här symbolen visas på produkten måste användaren läsa i användarhandboken för att få information och råd om säkerheten.

Om utrustningen används på ett sätt som tillverkaren inte har avsett kan utrustningens säkerhet försämrats.



**WARNING:** SPA2-2 måste vara jordad. Hela maskinen måste jordas – detta ansvar åligger återförsäljaren eller installatören.



**WARNING:** SPA2-2 isoleras från strömförsörjningen genom att koppla bort växelströmskontakten från den bakre panelen. Om andra metoder behövs för att bryta strömmen måste maskintillverkaren eller installatören specificera och montera dessa. Brytaren måste sitta så att koordinatmätmaskinens operatör enkelt kan komma åt den. Den ska följa SS-EN 61010-1:2010 (eller aktuell version) och andra tillämpliga nationella regler för elinstallation i det land där installationen sker.



**WARNING:** Underhåll får endast utföras efter att maskinen har kopplats bort från elförsörjningen, tryckluftsförsörjningen eller andra energikällor i enlighet med maskintillverkarens anvisningar.

## Maskinsäkerhet



**WARNING:** Även om SPA2-2 stängs av eller kopplas ur så KAN ÄNDÅ oväntade maskinrörelser uppstå. Användaren rekommenderas att bryta strömmen, tryckluften och andra energikällor till maskinen i enlighet med maskintillverkarens anvisningar, innan någon person går in i riskzonen eller utför något underhåll.



**SE UPP:** Vi rekommenderar starkt att tillverkaren eller eftermonteraren av koordinatmätmaskiner inkluderar ett periodiskt test av nödstoppen samt eventuellt tillhörande återställningsknapp i sina underhållsinstruktioner.

## SPA2-2 installation guide

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# ZH-TW - 安全



產品上若標有此符號，使用者必須參閱安裝指南，瞭解相關資訊與安全須知。

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。



**警告：**SPA2-2 必須接地。OEM 或安裝人員應負責整個機器的接地措施。



**警告：**透過斷開後面板上的交流電源連接器，將 SPA2-2 斷電。如需任何額外的隔離措施，則必須由機器製造商或產品安裝人員指定並安裝。隔離器必須放置在 CMM 操作員容易到達的地方，並符合 BS EN 61010-1:2010 (或當前版本) 以及安裝國家/地區的任何適用佈線法規。



**警告：**僅應在按照機器製造商的指示將機器與供電、壓縮空氣供應或其他能源隔離之後，才能進行維護。

## 機器安全性



**警告：**關閉或隔離 SPA2-2 並無法防止不可預期的機器移動。建議使用者在進入危險區或執行任何維護作業前，先依據機器製造商的指示，隔離機器的供電、壓縮空氣或其他能源。



**警告：**強烈建議 CMM 製造商或改裝人員納入緊急停止的定期測試，若已納入，相關人員可在維護指示中重設開關。

## SPA2-2 installation guide

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# ZH - 安全须知



如果产品上显示此符号，用户必须参见“安装指南”，了解相关信息和安全建议。

如果设备使用方式与制造商要求的方式不符，则可能会损害设备的安全性能。



**警告:** SPA2-2 必须布置地线。整台机器的地线布置由 OEM 或安装服务商负责。



**警告:** 通过断开后面板的交流电源连接器，将 SPA2-2 断电。如果需要任何形式的额外绝缘隔离措施，必须由设备制造商或产品安装人员指定并安装。隔离器必须放置在 CMM 操作员容易触及的位置，并符合 BS EN 61010-1:2010(或当前版本)以及安装所在国家/地区的任何适用布线法规。



**警告:** 只有在按照机器制造商的说明断开机器电源、压缩气源或其他能源来源以后才能进行维护。

## 机器安全须知



**警告:** 关闭或隔离 SPA2-2 也许不能防止机器意外移动。建议用户在进入危险区域或执行任何维护操作前，须按照机器制造商的说明断开机器电源、压缩气源或其他能量来源。



**小心:** 强烈建议坐标测量机制造商或改造商在其维护说明中包含对急停安全系统进行定期测试和相关复位开关(如安装)的内容。

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