

SPA2-2 installation guide

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SPA2-2 installation guide

Documentation part number: H-1000-5247-06-C



SPA2-2 installation guide

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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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Product compliance

EU declaration of conformity

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

UK declaration of conformity

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

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.

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.

REACH regulation

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

www.renishaw.com/REACH

China RoHS

Contact Renishaw plc or visit www.renishaw.com/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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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:** The SPA2-2 must not be powered directly from the mains.
A single fault tolerant PSU approved to BS EN 60950-1:2006+A2:2013 (or current version) must be used, and connected to a supply incorporating a protective earth conductor.

 **WARNING:** SPA2-2 is isolated from the power supply by disconnection of the ac power connector from the external PSU. 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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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.

CZ - 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.

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。

中文 — 警告

在拆包和安裝本產品之前，請翻到附錄1，閱讀中文版安全說明。

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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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References and associated documents

Title	Document number
Installation guide: UCC2	H-1000-5223
Installation guide: UCCLite-2 and UCCLite	H-1000-5109
Installation guide: UCC BI	H-1000-7602
Installation guide: UCC S5	H-1000-7502

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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System description

The SPA2-2 is a digital servo power amplifier solution designed specifically for use with the Renishaw brushless motor interfaces (e.g. UCC BI), and the now obsolete UCC2 or UCCLite-2 controllers. 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, UCC2 or UCCLite-2 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.



NOTE: The UCCLite-2 only permits 3-axis of machine control.

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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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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-5402-8612	SPA2-2 REVO kit	3 + REVO	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 UCC2 or 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

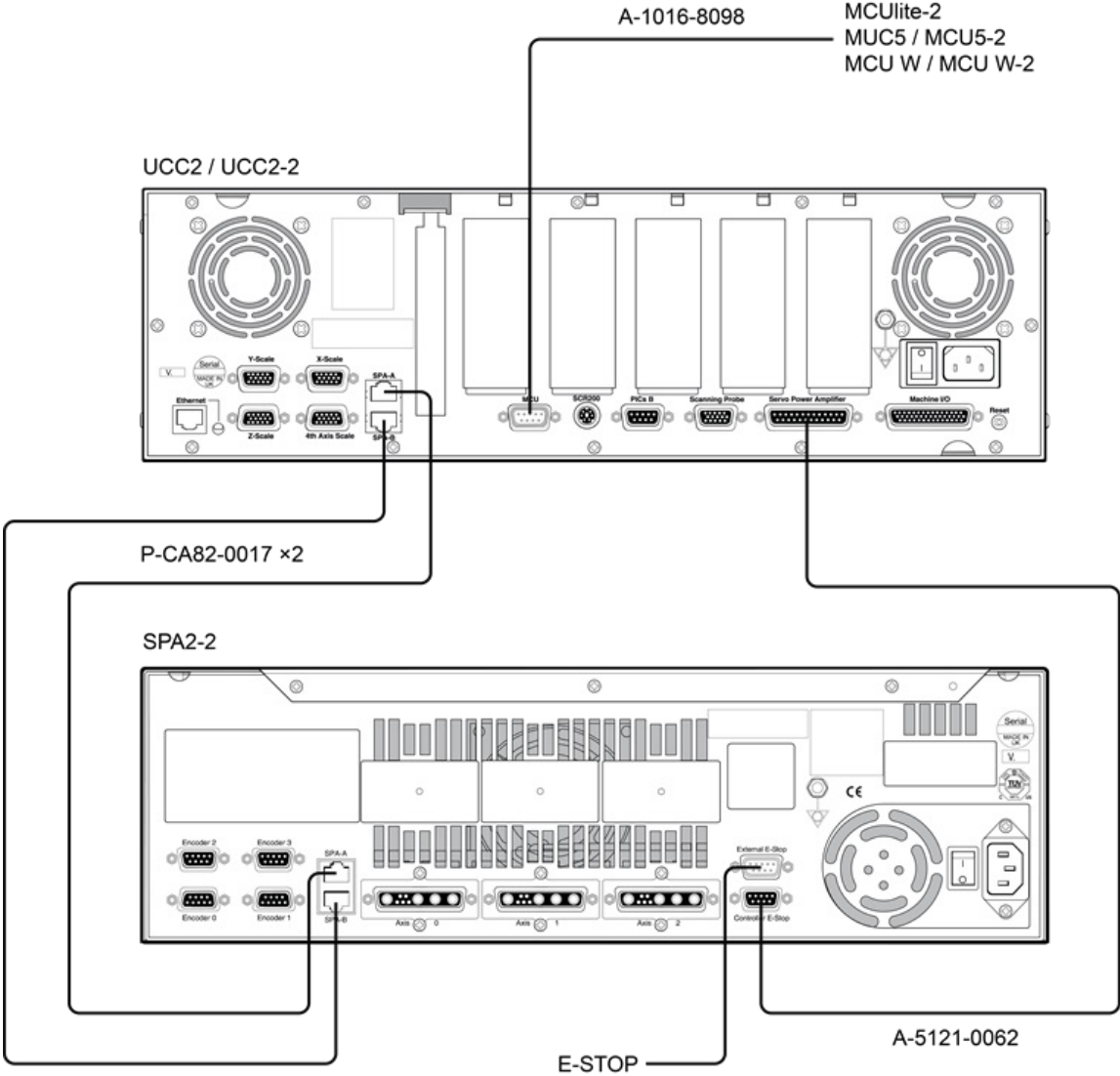
This cable kit is designed to permit a high power solution for CMM installations where the power capacity of a single SPA2-2 will not address the requirements for the machine.

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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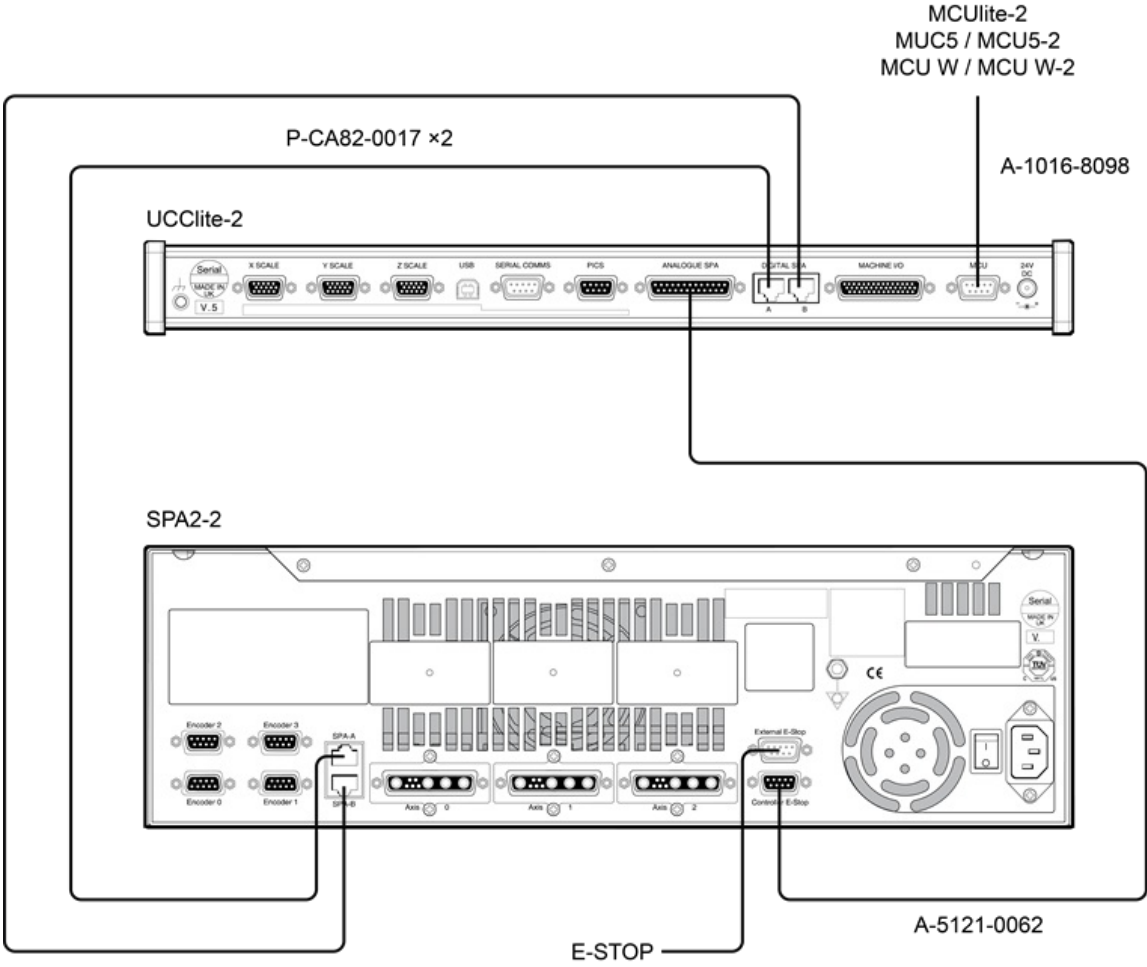
SPA2-2 and UCC2 3-axis system layout



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SPA2-2 and UCCLite-2



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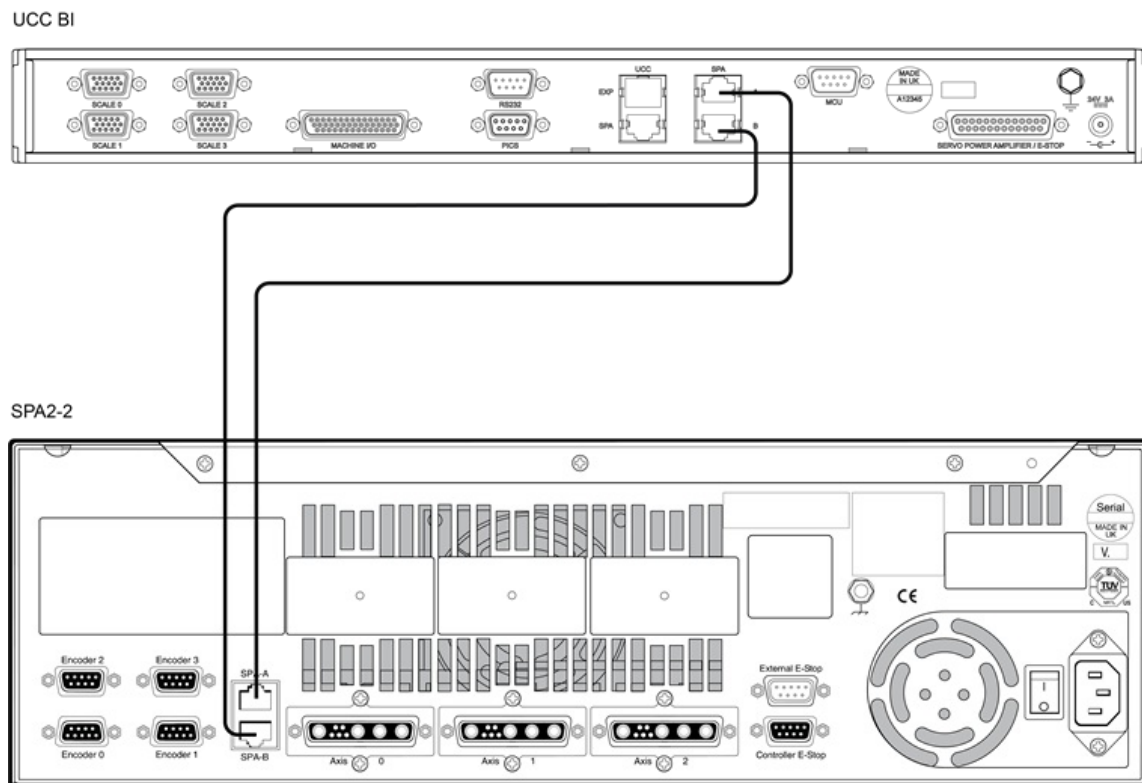
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SPA2-2 comms connection

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.



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

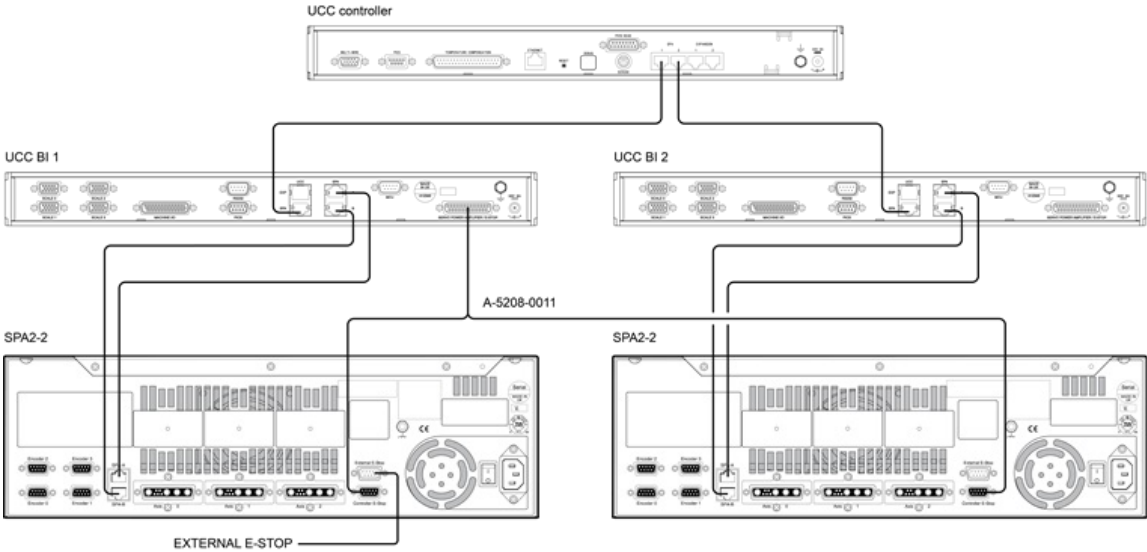
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Dual UCC BI interconnection

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.



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

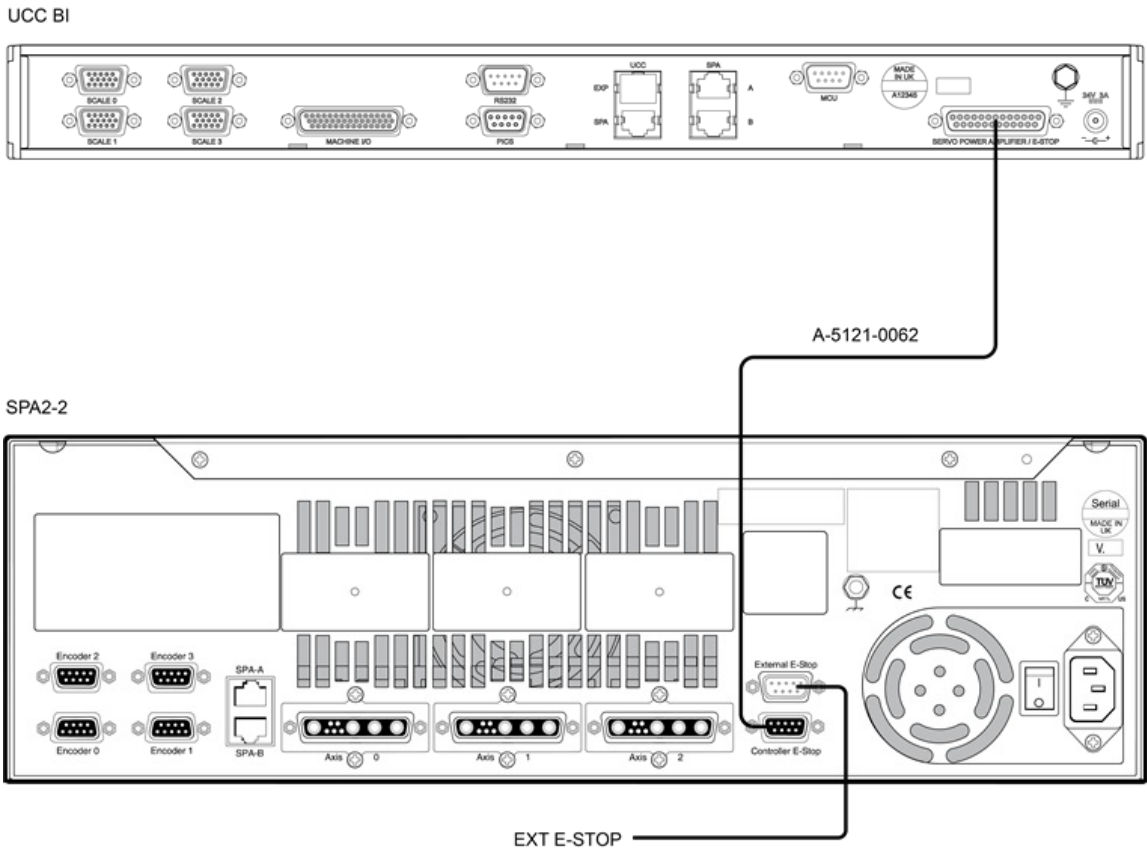
! **CAUTION:** The capability to use the UCC BI in a dual SPA system or a system using absolute scales is not yet available, please contact CMM support for further information.

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UCC BI to SPA2-2

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).

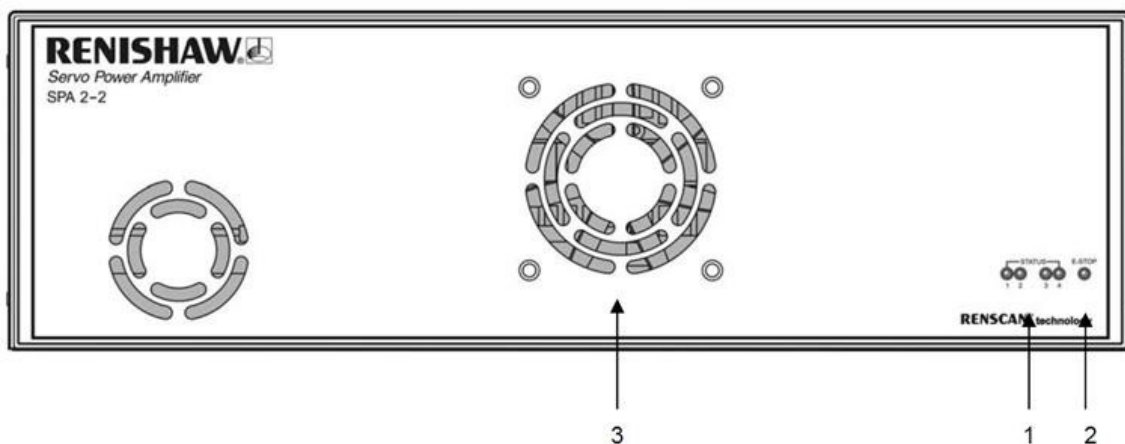


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Front panel description

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.

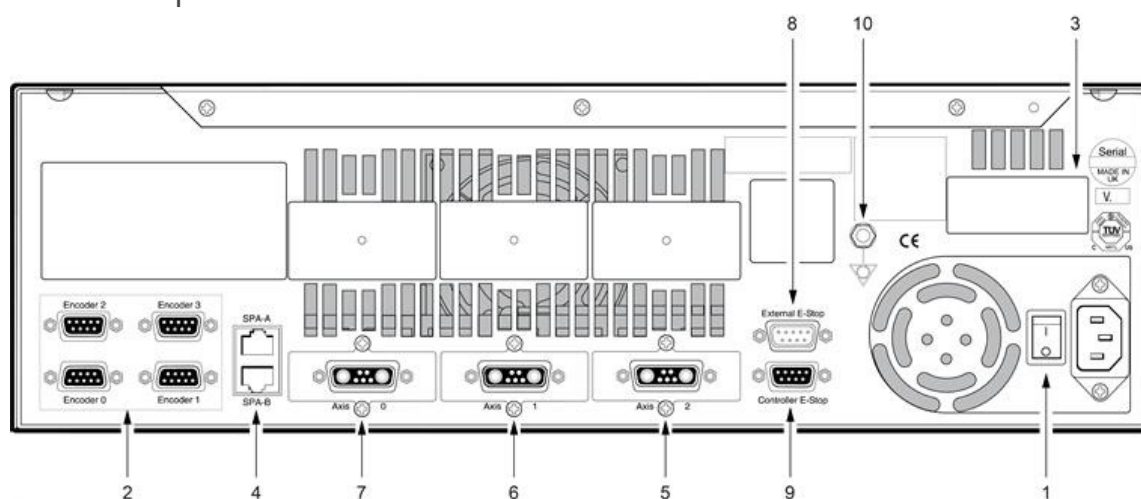
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Rear panel description

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, UCC2 and UCCLite 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, UCC2 and UCCLite emergency stop connector	UCC2 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 and UCC2, UCCLite 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 UCC2-2 / 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 UCC2, UCCLite or 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 and emergency switching off.



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:

Pin number	Function
6	ESTOP A
7	ESTOP B
5	RESET A
9	RESET B

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 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.

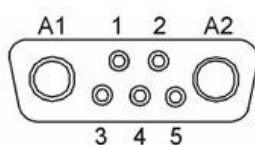
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Motor connectors

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



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

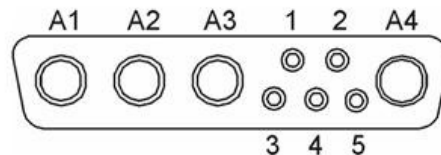


WARNING: If the SPA2-2 is being integrated on a dual axes DCC driven machine it is essential that the motor polarities on the dual axes are the same.

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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	+ve motor connection (default)
A2	Reserved for future expansion
A3	-ve 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

i 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).



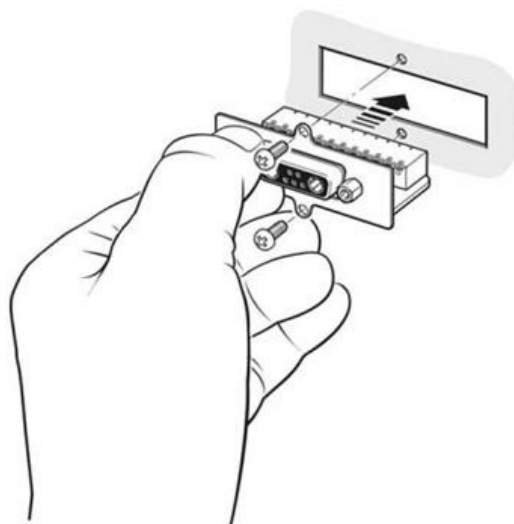
CAUTION: It is essential that each axis connector location should have either a connector blanking plate or a motor connector in place before the SPA2-2 is powered up.



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).

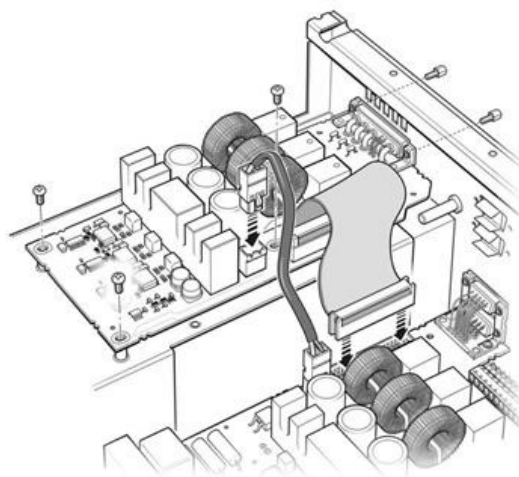


NOTE: If this interface card is being fitted to a 6-axis SPA2-2 then the communication and power cables will have already been installed on the lower motherboard. In this instance the cables supplied with the kit can be discarded.

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.

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 ²)	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 ²)	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 ²)	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:-

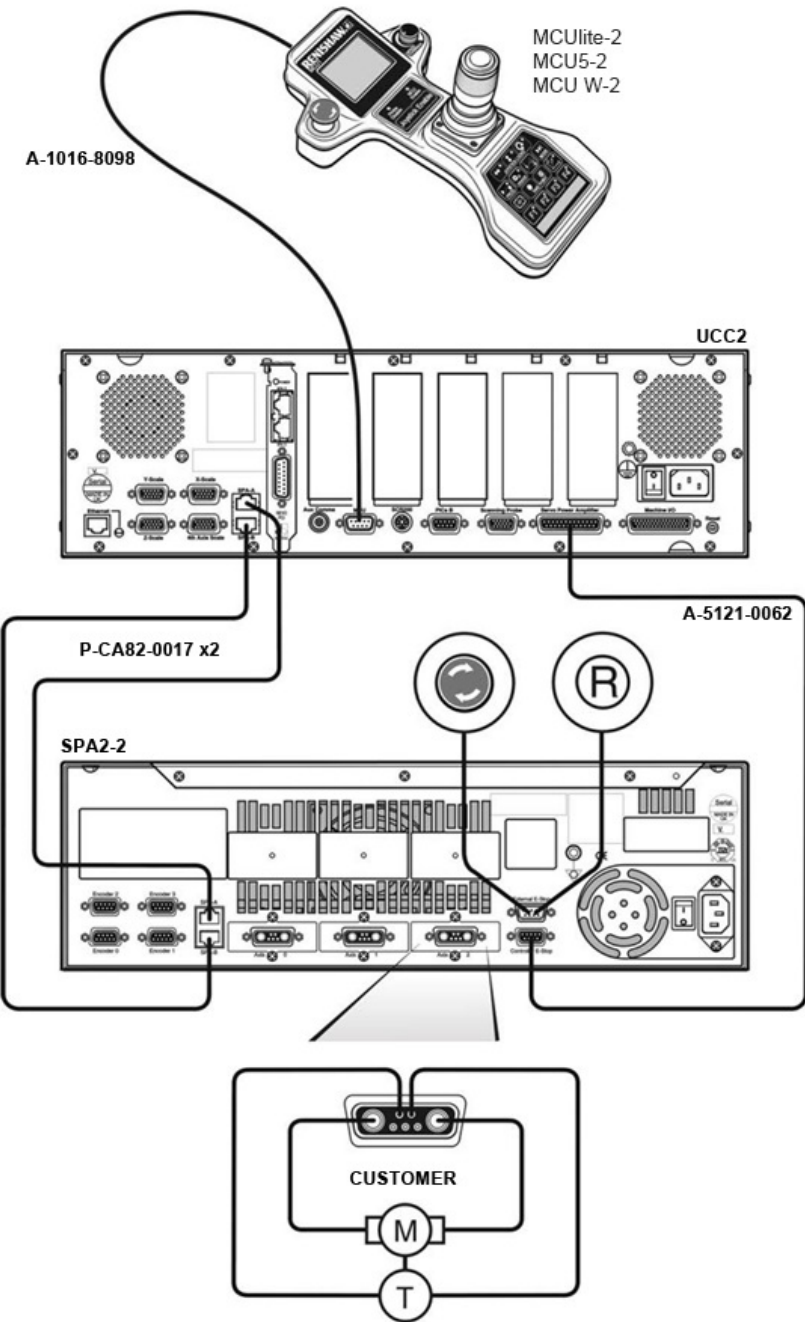
- The 4th axis card for the SPA2-2 is different from the one for the SPA2 and cannot be interchanged, i.e. the 4th axis card must be correct one for the SPA type (the motor connections are the same on both so there is no problems on changing between SPA2 and SPA2-2 on an installation).
- The axis motor 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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SPA2-2 interconnection schemes

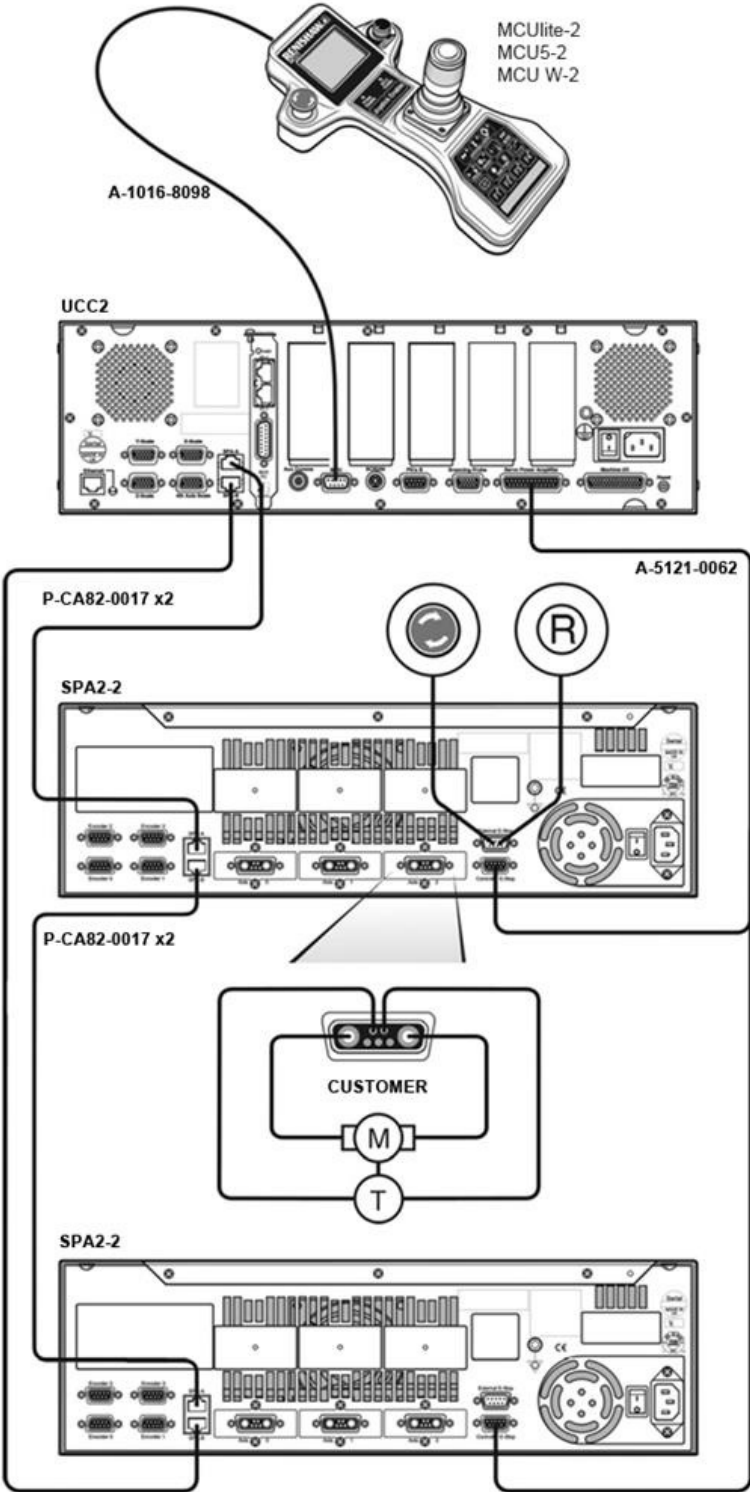
UCC2 3-axis system with dc motor and tacho connection



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UCC2 6-axis system with dc motor and tacho connection



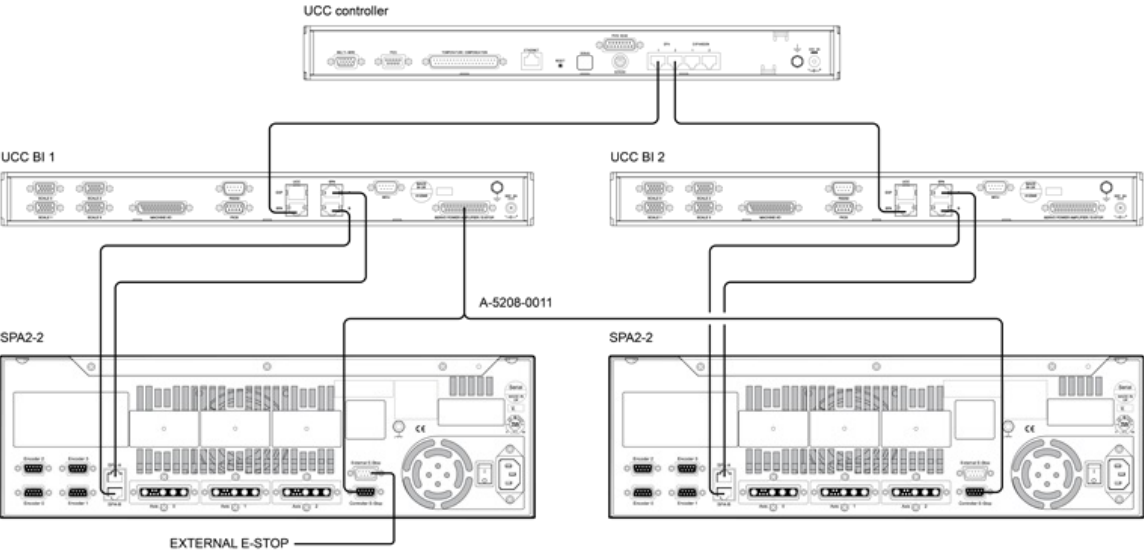
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Dual UCC BI interconnection

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.



i **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 or a system using absolute scales is not yet available, please contact CMM support for further information.

Appendix 1 - International safety statements


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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 не трябва да се захранва директно от електрическата мрежа. Трябва да се използва захранващо устройство, толерантно към единични грешки, одобрено по стандарт BS EN 60950-1:2006+A2:2013 (или текущата версия), и да се свърже към захранване, включващо проводник за защитно заземяване.

 **ПРЕДУПРЕЖДЕНИЕ:** SPA2-2 се изключва от електрозахранването чрез откъчване на захранващия съединител IEC от външното захранващо устройство. Ако се изисква допълнително средство за изолация, то трябва да бъде посочено и монтирано от производителя на машината или монтажника на продукта. Изолаторът трябва да е разположен така, че операторът на СММ да има лесен достъп до него и да отговаря на стандарт BS EN 61010-1:2010 (или на текущата версия) и на всяка приложима нормативна уредба за опроводяване в страната на монтажа.

 **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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CZ - 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.


 **UPOZORNĚNÍ:** Systém SPA2-2 nesmí být napájen přímo z elektrického rozvodu. Je nezbytné použít jeden zdroj napájení (PSU) odolný proti výpadkům, který splňuje normu BS EN 60950-1:2006+A2:2013 (nebo aktuální verzi). PSU musí být připojen ke zdroji, který je vybaven ochranným uzemňovacím vodičem.

 **UPOZORNĚNÍ:** Systém SPA2-2 se odpojuje od zdroje napájení stejnosměrným proudem odpojením napájecího konektoru z externího PSU. Další požadované prostředky pro odpojení přívodu musí specifikovat a připojovat výrobce zařízení nebo ten, kdo zařízení instaluje. Odpojovací prvek musí být umístěn ve snadném dosahu obsluhy souřadnicového měřicího stroje a splňovat normu BS EN 61010-1:2010 (nebo aktuální verzi) a všechny příslušné státní předpisy pro zapojení platné 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. Ansvar for bestemmelserne om jordforbindelse for hele maskinen ligger hos OEM eller installatør.



ADVARSEL: SPA2-2 må ikke tilføres strøm direkte fra netstrømforsyningen.
En enkelt fejltolerant PSU, som er godkendt i henhold til BS EN 60950-1:2006+A2:2013 (eller aktuel version), skal anvendes og forbindes med en forsyning, der inkorporerer en beskyttende jordledning.



ADVARSEL: Strømforsyningen til SPA2-2 isoleres ved at tage AC-strømkablet ud af den eksterne PSU. Hvis der kræves yderligere måder at isolere strømforsyningen på, skal de være specificeret og monteret af maskinproducenten eller installatøren af produktet. Afbryderen skal være placeret, så CMM-operatøren nemt kan nå den, og den skal overholde BS EN 61010-1:2010 (eller aktuel version) og eventuelle andre relevante nationale regulativer for ledningsføring i det land, hvor installationen foretages.



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: Der SPA2-2 darf nicht direkt über das Netz betrieben werden. Es muss ein nach DIN EN 60950-1:2006+A2:2013 (bzw. aktuelle Version) zugelassenes, ausfallsicheres, fehlertolerantes Netzteil verwendet werden, das an eine Versorgung mit Schutzleiter angeschlossen ist.



WARNHINWEIS: Der SPA2-2 wird durch Lösen des Stromkabels am externen Netzteil von der Stromversorgung getrennt. Wird eine weitere Abschaltmöglichkeit benötigt, ist diese zu spezifizieren und vom Maschinenhersteller oder Installationstechniker für das Produkt einzubauen. Der Trennschalter muss für den Bediener leicht erreichbar sein und die Bestimmungen laut DIN EN IEC 61010-1:2010 (bzw. aktuelle Version) sowie auch alle anderen gültigen nationalen Verdrahtungsvorschriften im Installationsland erfüllen.



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.


 **ΠΡΟΕΙΔΟΠΟΙΗΣΗ:** Το SPA2-2 δεν πρέπει να τροφοδοτείται απευθείας από το δίκτυο. Πρέπει να χρησιμοποιείται ένα μόνο ανθεκτικό σε σφάλματα PSU εγκεκριμένο σύμφωνα με το πρότυπο BS EN 60950-1: 2006 + A2: 2013 (ή τρέχουσα έκδοση) και να είναι συνδεδεμένο σε μια τροφοδοσία που περιλαμβάνει προστατευτικό αγωγό γείωσης.


 **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 φινιρίσματος παροχής εναλλασσόμενου ρεύματος από το εξωτερικό τροφοδοτικό. Εάν απαιτούνται οποιαδήποτε συμπληρωματικά μέσα απομόνωσης, πρέπει αυτά να καθοριστούν και να τοποθετηθούν από τον κατασκευαστή της μηχανής ή από τον εγκαταστάτη του προϊόντος. Ο απομονωτής πρέπει να βρίσκεται σε σημείο εύκολα προσβάσιμο από το χειριστή του CMM και να συμμορφώνεται με το πρότυπο BS EN 61010-1:2010 (ή την τρέχουσα έκδοση) και με οποιουδήποτε εφαρμοζόμενους εθνικούς κανονισμούς 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 οποιοσδήποτε εργασίες συντήρησης.

 **ΠΡΟΣΟΧΗ:** Συστήνεται 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:** The SPA2-2 must not be powered directly from the mains. A single fault tolerant PSU approved to BS EN 60950-1:2006+A2:2013 (or current version) must be used, and connected to a supply incorporating a protective earth conductor.

 **WARNING:** SPA2-2 is isolated from the power supply by disconnection of the ac power connector from the external PSU. 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 no debe estar conectado directamente a la toma eléctrica. Se debe utilizar una única PSU tolerante a fallos, según la norma BS EN 60950-1:2006+A2:2013 (o su versión actual), que se debe conectar a una toma de protección a tierra.



ADVERTENCIA: El SPA2-2 se aísla de la fuente de alimentación desconectando el conector de alimentación de CA de la FDA externa. 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 aislante se colocará en un punto de fácil acceso para el operario de la MMC y debe cumplir la norma BS EN 61010-1:2010 (o su versión actual) y las regulaciones de cableado correspondientes al país de la 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.

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ET - Ohutus



Kui seadmel on kujutatud see sümbol, peab kasutaja lugema paigaldusjuhendit, et saada infot ja nõu turvalise käsitemise 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 ei tohi toita otse vooluvõrgust. Tuleb kasutada ühte rikketaluvat PSU-d, mis on heaks kiidetud standardi BS EN 60950-1:2006+A2:2013 (või praeguse versiooni) järgi, ja mis on ühendatud maandatud toitekaabliga.



HOIATUS! SPA2-2 isoleeritakse toiteallikast vahelduvvoolu toitepistikü välisest toiteallikast lahtiühendamise abil. Kui esineb vajadus lisaisoleerimisviiside järele, tuleb need määratleda ja paigaldada masina tootjal või toote paigaldajal. Isolaator peab asuma koordinaatmõõtemasina operaatorile kergelt ligipääsetavas kohas ja olema kooskõlas standardiga BS EN 61010-1:2010 (või praegune versioon) ning teiste juhtmestikke puudutavate kohalduvate riiklike eeskirjadega.



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 lähtestuslüliti 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:n virta ei saa tulla suoraan verkkovirtalähteestä. Sen kanssa on käytettävä yhtä vikasietoista BS EN 60950-1:2006+A2:2013 -standardin (tai uusimman version) mukaista PSU-yksikköä, ja se on kytkettävä suojamaadoitusjohtimella varustettuun virtalähteeseen.

 **VAROITUS:** SPA2-2 eristetään virransyötöstä irrottamalla vaihtovirtaliitin ulkoisesta virransyötöstä. Jos ylimääräisiä eristyskeinoja tarvitaan, tuotteen valmistajan tai asentajan on määritettävä ne ja asennettava ne koneeseen. Eristyskytkin on sijoitettava BS EN 61010-1:2010 -standardin (tai uusimman version) ja asennuspaikalla voimassa olevien sähköteknisten asennusohjeiden mukaisesti sellaiseen paikkaan, jossa se on helposti CMM-käyttäjän ulottuvilla.

 **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.


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FR - Sécurité


 Lorsque ce symbole est affiché sur le produit, vous devrez 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** : Le SPA2-2 ne doit pas être directement alimenté sur secteur. Un bloc d'alimentation présentant une tolérance à un défaut unique, homologué suivant la norme BS EN 60950-1:2006+A2:2013 (ou sa version actuelle) doit être utilisé et branché sur une alimentation intégrant un conducteur de terre.

 **AVERTISSEMENT** : Le SPA2-2 un moyen complémentaire de sectionnement est nécessaire, celui-ci devra être spécifié et installé par le constructeur de la machine ou l'installateur du produit. L'opérateur MMT doit pouvoir accéder facilement à ce sectionneur qui doit être conforme à la norme BS EN 61010-1:2010 (ou sa version actuelle) ainsi qu'à toute autre réglementation nationale de câblage en vigueur 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 rétrofit 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:** Ní ceadmhach don SPA2-2 soláthar cumhachta a fháil go díreach ón phríomhlíonra. Ní mór PSU aonair lochtlamhálach atá ceadaithe de réir BS EN 60950-1:2006+A2:2013 (nó leagan reatha) a úsáid agus a nascadh le soláthar a chuimsíonn seoltóir talún cosantach.

 **RABHADH:** Is féidir SPA2-2 a aonrú ón soláthar cumhachta tríd an nascóir cumhachta AC a dhínascadh den PSU seachtrach. Má tá aon mhodhanna aonraithe breise riachtanach, ní mór do dhéantúsóir an mheaisín nó suiteálaí an táirge é a mhionsonrú agus a shuiteáil. Ní mór an t-aonraitheoir a shuiteáil cóngarach don oibritheoir CMM agus é i gcomhlíonadh le BS EN 61010-1:2010 (nó leis an leagan reatha) agus le haon rialacháin náisiúnta sreangaithe atá i bhfeidhm sa tír ina suiteáiltear é.

 **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 chríos guaise nó sula ndéantar aon oibriúcháin chothabhála.

 **AIRE:** Moltar go láidir do dhéantúsóir an CMM nó don té a aiseisteíonn 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: Uređaj SPA2-2 ne smije se napajati izravno iz električne mreže.

PSU mora biti tolerantan na jednostruki kvar, odobren prema normi BS EN 60950-1:2006+A2:2013 (ili trenutnoj verziji) te mora biti priključen u utičnicu sa zaštitnim uzemljenjem.



UPOZORENJE: SPA2-2 se izolira od napajanja isključivanjem priključka izmjenične struje iz vanjskog PSU. Ako je potrebna neka dodatna izolacija, mora je navesti i izvesti proizvođač stroja ili instalater proizvoda. Izolator mora biti smješten tako da bude lako dostupan CMM operateru i usklađen s normom BS EN 61010-1:2010 (ili trenutnom verzijom) te svim primjenjivim nacionalnim propisima u vezi s ožičenjem u državi u kojoj se instalira.



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.


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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 készülék áramellátását közvetlenül a hálózatról kell biztosítani. Egyetlen, a BS EN 60950-1:2006+A2:2013 szabvány (vagy annak aktuális változata) alapján jóváhagyott hibatűrő tápegységet (PSU-t) kell használni és csatlakoztatni a tápellátáshoz védő földelővezeték beépítésével.

 **FIGYELMEZTETÉS:** Az SPA2-2 készülék tápellátásról való leválasztása a váltóáramú tápcsatlakozó külső tápegységről (PSU) való leválasztásával történik. Ha egyéb leválasztásra lenne szükség, akkor azt a gép gyártójának vagy a termék beszerelőjének kell meghatározni és beszerelnie. A leválasztónak a CMM kezelője számára könnyen hozzáférhető helyen kell lennie, és meg kell felelnie a BS EN 61010-1:2010 szabványban (vagy annak aktuális változatában) foglalt előírásoknak, illetve a területileg érvényes villamos bekötési szabályoknak.

 **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:** ISPA2-2 non deve essere collegato direttamente alla rete elettrica. Deve essere utilizzato un alimentatore conforme allo standard BS EN 60950-1:2006+A2:2013 (o versione vigente), a prova di guasto e collegato ad una rete dotata di un conduttore a terra protettivo.

 **AVVISO:** SPA2-2 viene isolato elettricamente scollegando il connettore dall'alimentare esterno. 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 dovrà essere posizionato in un punto facilmente accessibile all'operatore CMM e dovrà risultare conforme allo standard BS EN 61010-1:2010 (o versione vigente) e a tutte le normative nazionali sui cablaggi in vigore nel paese di installazione.

 **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).

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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 は主電源から直接電源を取らないようにしてください。
BS EN 60950-1:2006+A2:2013(または最新版)に準拠した 1 台の安定化 PSU を使用し、保護アースのある電源に接続してください。



警告: SPA2-2 は、外付け PSU からの 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。

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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 neturi būti prijungtas tiesiai prie elektros lizdo. Reikia naudoti atskirą triktims atsparų PSU, patvirtintą pagal BS EN 60950-1:2006+A2:2013 (arba naujesnę versiją), prijungiant įrenginį prie elektros tinklo per apsauginį jungiklį su įžeminimu.



ĮSPĖJIMAS: atjungus kintamosios srovės maitinimo jungtį nuo išorinio maitinimo bloko (PSU), SPA2-2 yra izoliuotas nuo maitinimo. Jei reikia papildomų atskyrimo priemonių, jas turi nurodyti ir sumontuoti įrenginio gamintojas arba gaminio montuotojas. Skyriklis turi būti lengvai pasiekiamas koordinatinės matavimo mašinos operatoriui ir turi atitikti BS EN 61010-1:2010 (arba naujesnę versiją) bei kitas valstybės, kurioje montuojama mašina, elektros laidų 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 nedrīkst darbināt tieši no barošanas tīkla.

Jāizmanto bojājumpieciešams nepārtrauktās barošanas avots, kas apstiprināts saskaņā ar standarta BS EN 60950-1:2006+A2:2013 (vai pašreizējās versijas) prasībām, un tam jābūt pievienotam strāvas padevei ar aizsargzemējuma vadu.



BRĪDINĀJUMS: SPA2-2 no strāvas padeves iespējams atvienot, atvienojot maiņstrāvas savienotāju no ārējā barošanas avota. Ja nepieciešami papildu atvienošanas līdzekļi, tie ir jānorāda un jānodrošina iekārtas ražotājam vai izstrādājuma uzstādītājam. Izolatoram jābūt novietotam tā, lai tas būtu viegli pieejams koordinēto mērīšanas mašīnu operatoram un atbilstu BS EN 61010-1:2010 (vai pašreizējās versijas) prasībām un jebkuriem saistītajiem uzstādīšanas valsts elektrotehniskajiem 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: L-iSPA2-2 irid jingħata d-dawl direttament mill-mejns. PSU uniku b'tolleranza ta' errur approvat skont BS EN 60950-1:2006+A2:2013 (jew verżjoni attwali) għandu jintuza, u jiġi mqabbd għal provvista li tinkorpora konduttur protettiv tal-ert.



TWISSIJA: SPA2-2 jiġi iżolat mill-provvista tad-dawl billi tiskonnettja l-konnettur tal-provvista tad-dawl AC mill-PSU estern. Jekk kwalunkwe mezz addizzjonali ta' iżolament ikun meħtieġ, dan irid jiġi speċifikat u installat mill-manifattur tal-magna jew mill-installatur tal-prodott. L-iżolatur irid jitpoġġa fejn ikun jista' jintlaħaq faċilment mill-operatur tas-CMM u jrid ikun konformi ma' BS EN 61010-1:2010 (jew verżjoni attwali) u ma' kwalunkwe regolamenti nazzjonali applikabbli dwar il-wiring għall-pajjiż fejn ikun qed jiġi installat.



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.

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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: De SPA2-2 mag niet rechtstreeks op het lichtnet worden aangesloten. Er moet een voedingseenheid worden gebruikt met een enkele fouttolerantie die is goedgekeurd volgens BS EN 60950-1:2006+A2:2013 (of de huidige versie), en deze moet worden aangesloten op een voeding met een aardingsgeleider.



WAARSCHUWING: De SPA2-2 wordt van de stroom afgesloten door de wisselstroomconnector los te koppelen van de externe voedingseenheid. Als nog een extra manier van afsluiten gevraagd wordt, dan moet die gespecificeerd en geplaatst worden door de machinefabrikant of de monteur van het product. De afsluitvoorziening moet ruim binnen het bereik van de CMM-operator aangebracht worden en voldoen aan BS EN 61010-1:2010 (of huidige versie) en de andere elektrische regels die gelden in het land van plaatsing.



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:** SPA2-2 nie może być zasilany bezpośrednio ze złącza głównego. Należy używać zewnętrznego zasilacza przystosowanego do użytku w warunkach pojedynczej awarii, zgodnego z wymaganiami normy BS EN 60950-1:2006+A2:2013 (lub jej najnowszej wersji) i podłączonego do zasilania wraz z ochronnym przewodem uziemiającym.

 **OSTRZEŻENIE:** Sterownik SPA2-2 jest izolowany od zasilania poprzez odłączenie złącza zasilania sieciowego od zewnętrznego zasilacza. Gdy wymagane są jakiegokolwiek dodatkowe środki ochrony, ich dane techniczne muszą być określone i muszą one być zainstalowane przez producenta maszyny lub instalatora produktu. Wyłącznik musi być umieszczony w taki sposób, aby zapewniać operatorowi CMM (współrzędnościowa maszyna pomiarowa) łatwy dostęp do niego oraz musi spełniać wymagania normy BS EN 61010-1:2010 (lub jej najnowszej wersji) i wszelkich przepisów dotyczących okablowania, jakie obowiązują 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 não deve ser ligado a partir da rede elétrica. Deve ser utilizada uma PSU tolerante a uma única falha aprovada pela BS EN 60950-1:2006+A2:2013 (ou equivalente atual) e ligada a uma fonte que incorpore um condutor de proteção terra.

 **AVISO:** O SPA2-2 é isolado da fonte de alimentação ai desligar o conector de alimentação CA da PSU fornecida. Se forem necessários meios adicionais de isolamento, devem ser especificados e instalados pelo fabricante da máquina ou pelo instalador do produto. O isolador deve ser instalado num local fácil de alcançar pelo operador de CMM e cumprir a norma BS EN 61010-1:2010 (ou equivalente atual) e com os regulamentos de ligação nacionais aplicáveis no 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 elétrico, 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.


 **AVERTISMENT:** SPA2-2 nu trebuie alimentat direct de la rețea.
Trebuie utilizată o singură sursă de alimentare tolerantă la erori omologată conform cu BS EN 60950-1:2006+A2:2013 (sau versiunea curentă); aceasta trebuie conectată la o alimentare care include un conductor de împământare de protecție.

 **AVERTISMENT:** SPA2-2 este izolat de sursa de alimentare prin decuplarea conectorului de alimentare cu curent alternativ de la sursa externă. Dacă sunt necesare mijloace suplimentare de izolare, acestea trebuie specificate și montate de către producătorul sau instalatorul produsului. Echipamentul de izolare trebuie poziționat la îndemâna operatorului și trebuie să corespundă normei BS EN 61010-1:2010 (sau versiunea curentă), precum și reglementărilor naționale de cablare 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.


 **VÝSTRAHA:** Prístroj SPA2-2 musí byť pripojený k zdroju priamo zo zásuvky. Musí sa použiť tolerancia voči jednoduchej poruche PSU schválená podľa BS EN 60950-1:2006+A2:2013 (alebo aktuálna verzia) a pripojenie k napájaniu musí obsahovať ochranný uzemňovací vodič.

 **VÝSTRAHA:** Prístroj SPA2-2 je izolovaný od sieťového napájania odpojením sieťového konektora z externého zdroja napájania. Aj sú nutné akékoľvek dodatočné izolujúce zariadenia, musí ich stanoviť a dodať výrobca alebo montér tohto produktu. Izolátor musí byť umiestnený tak, aby bol ľahko dostupný pre pracovníka obsluhujúceho súradnicový merací prístroj (CMM) a musí spĺňať normu BS EN 61010-1:2010 (alebo aktuálnu verziu) a všetky príslušné národné predpisy týkajúce sa káblových rozvodov platné 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.

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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 se ne sme napajati neposredno iz električnega omrežja.

Uporabiti je treba napajalnik, ki je odporen na posamične napake in odobren skladno s standardom BS EN 60950-1:2006+A2:2013 (ali trenutno veljavno različico), ter ga povezati z napajanjem, ki vključuje zaščitni ozemljitveni vodnik.



OPOZORILO: SPA2-2 se od vira napajanja loči z odklopom napajalnega priključka iz zunanjšega napajalnika. Če so potrebni dodatni ukrepi za ločevanje, jih mora zasnovati in vgraditi proizvajalec stroja ali inštalater izdelka. Ločilno sredstvo mora biti nameščeno v doseg operatorja KMS in mora biti skladno s standardom BS EN 61010-1:2010 (ali trenutno veljavno različico) ter z vsemi veljavnimi državnimi predpisi o električnih napeljavah v državi inštalacije.



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 får inte drivas direkt från elnätet.

En strömadapter med enkelfeltolerans som är godkänd enligt SS-EN 60950-1:2006 + A2:2013 (eller aktuell version) måste användas och anslutas till en elförsörjning med skyddande jordledare.



WARNING: För att koppla ur SPA2-2 från strömförsörjningen drar du ur kontakten på den externa strömadaptern. Om det krävs andra metoder 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 nödstoppn samt eventuellt tillhörande återställningsknapp i sina underhållsinstruktioner.

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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：SPA2-2切勿直接從主電源供電。

必須使用經BS EN 60950-1:2006+A2:2013(或當前版本)批准的單一不斷電電源供應器，並將其連接到包含保護性接地導體的電源。



警告：可以透過斷開外部電源供應器的交流電源接頭來切斷 SPA2-2 的電源。如果需要其他隔離措施，必須由機器製造商或產品安裝人員指定及安裝。隔離物必須設置在 CMM 操作員可及之處，並符合 BS EN 61010-1:2010 (或當前版本) 的標準與安裝國家適用的國家線路法規。



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。

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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: SPA2-2 不能直接由主电源供电。
必须使用符合 BS EN 60950-1:2006+A2:2013(或当前版本)标准的单个容错电源装置，并连接到带有保护性接地导体的电源上。



警告: 可以通过断开外部电源装置的交流电源接头来切断 SPA2-2 的电源。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。隔离器必须位于 CMM 操作人员易于操作的位置，并且符合 BS EN 61010-1:2010(或当前版本)和设备安装所在国适用的国家布线标准规定。



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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