

VA7 vision artefact user's guide

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VA7 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.

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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
Storage box	Polypropylene	PP	05
Packing foam	Low density polyethylene	LDPE	04



CAUTION: If it is necessary to return any part of the system please ensure it is packaged carefully. Failure to do so could result in transit damage for which the customer would be liable. Products supplied in plastic boxes must be returned in the original packaging.

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Patents

Features of Renishaw's RVP and associated products (such as REVO-2) are the subjects of one or more of the following patents and patent applications:

CN100453970	EP1877727	JP2016-533484	US10260856	WO2014/191729
CN101166951	EP1877732	JP2018-522240	US10591289	WO2015/049341
CN101166953	EP1989504	JP2019-536032	US10627259	
CN101405563	EP2002206	JP2021-193400	US10775159	
CN101405564	EP2002207	JP5196356	US2020-0049498	
CN101490430	EP2035719	JP5350216	US7533574	
CN101772690	EP2140318	JP5425476	US7809523	
CN102305613	EP2167911	JP5653581	US7861430	
CN102906533	EP2431707	JP5658863	US7885777	
CN103842766	EP2564151	JP5706158	US7971365	
CN105190230	EP2764324	JP5851969	US8006398	
CN105408723	EP3004797	JP6013533	US8186882	
CN105793695	EP3052926	JP6199870	US8302321	
CN107532930	EP3289314	JP6348577	US8425119	
CN107850425	EP3322959	JP6510425	US8474148	
CN109964098	EP3542130	JP7042620	US8511898	
			US8601701	
			US8756973	
			US8978261	
			US9038282	
			US9366519	
			US9903713	

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VA7 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 (47 CFR 15.105)

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

Information to user (47 CFR 15.21)

The user is cautioned that any changes or modifications not expressly approved by Renishaw plc or authorised representative could void the user's authority to operate the equipment.

Equipment label (47 CFR 15.19)

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
 2. This device must accept any interference received, including interference that may cause undesired operation.
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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.



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VA7 safety

Before unpacking and installing the VA7 vision artefact, the user should carefully read the safety instructions below and ensure that they are followed at all times by all operators.

Operators must be trained in the use and application of the REVO-2 system and accompanying products, in the context of the machine it is fitted to, before being allowed to operate that machine.

Permanent magnets are used in the VA7 to retain the lid. It is important to keep it away from items which may be affected by magnetic fields (e.g. data storage systems, pacemakers and watches). Keep fingers clear of the lid when closing.

The method of interrupting power is to disconnect the power cable or turn off the supply.

VA7 vision artefact LED emissions

The VA7 artefact incorporates a high-power LED backlight and should not be used in the event of serious damage to any part of the product.

In such cases immediately disconnect the power source, remove, and do not attempt to reuse the product. Contact your supplier for advice.

VA7 environmental and electrical specifications

Power supply	Connection to I/O on servo power amplifier or controller, such as SPA3-2, or 24 VDC 70 W power supply unit P-EA02-0021
Connections	9W 'D' type for PICS cable or 2.5 mm DC socket for PSU
Operating temperature range	20 °C ±2 °C
Storage temperature range	0 °C to +70 °C (32 °F to 158 °F)
Operating humidity	0% to 80% (non-condensing)
Storage humidity	0% to 80% (non-condensing)

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VA7 references and associated documents

The following Renishaw documents are referred to in this document or may be a source of further relevant information. They can easily be acquired from Renishaw web site www.renishaw.com.

Title	Document number
Installation and user's guide: REVO-2 and RSP2	H-1000-7590
Installation and user's guide: RSP3	H-1000-5124
Installation and user's guide: SFP2	H-1000-5365
User's guide: RVP	H-1000-3322
User's guide: RFP1	H-1000-5430
Installation guide: UCC S5	H-1000-7598
Installation guide: SPA3-2	H-1000-5364
Installation & user's guide: MCULite-2, MCU5-2 and MCU W-2	H-1000-5280
Installation and user's guide: MRS modular rack system	H-1000-5088
Installation guide: MRS2 modular rack system	H-1000-5255
Installation guide: REVO-2 change system port spacing guide	H-1000-5408
Technical specifications guide: Styli and accessories	H-1000-3200

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VA7 system description

Introduction

The VA7 vision artefact enables verification of the REVO vision probe (RVP), vision modules, and the ACM accessory to the ISO 10360-7 standard.

VA7 uses a backlit calibrated glass target powered through the configurable I/O socket on the SPA3-2 or through I/O on other servo power amplifiers or controllers, or by a 24 VDC 70 W PSU via the 2.5 mm DC socket. On an installation where a UCC AI / UCC BI is required, please contact Renishaw for further information.

It can be mounted horizontally for use with the VM10, VM11-2 and VM12 vision modules, or mounted vertically on a suitable fixture to verify ACM.

Operation

The VA7 artefact can be switched on or off using the I/O connection. Power can be drawn directly from the I/O connection and no additional power supply is required. Alternatively, VA7 can be powered using a 24 VDC 70 W PSU via the 2.5 mm DC socket. When using a PSU, the VA7 can be switched on or off by directly controlling the PSU. The VA7 must not be powered by both the DC socket and I/O connection at the same time. The verification routine is run by MODUS script, available from Renishaw on request. For the comfort of the user, it is recommended the VA7 should be immediately switched off once the verification routine has finished.

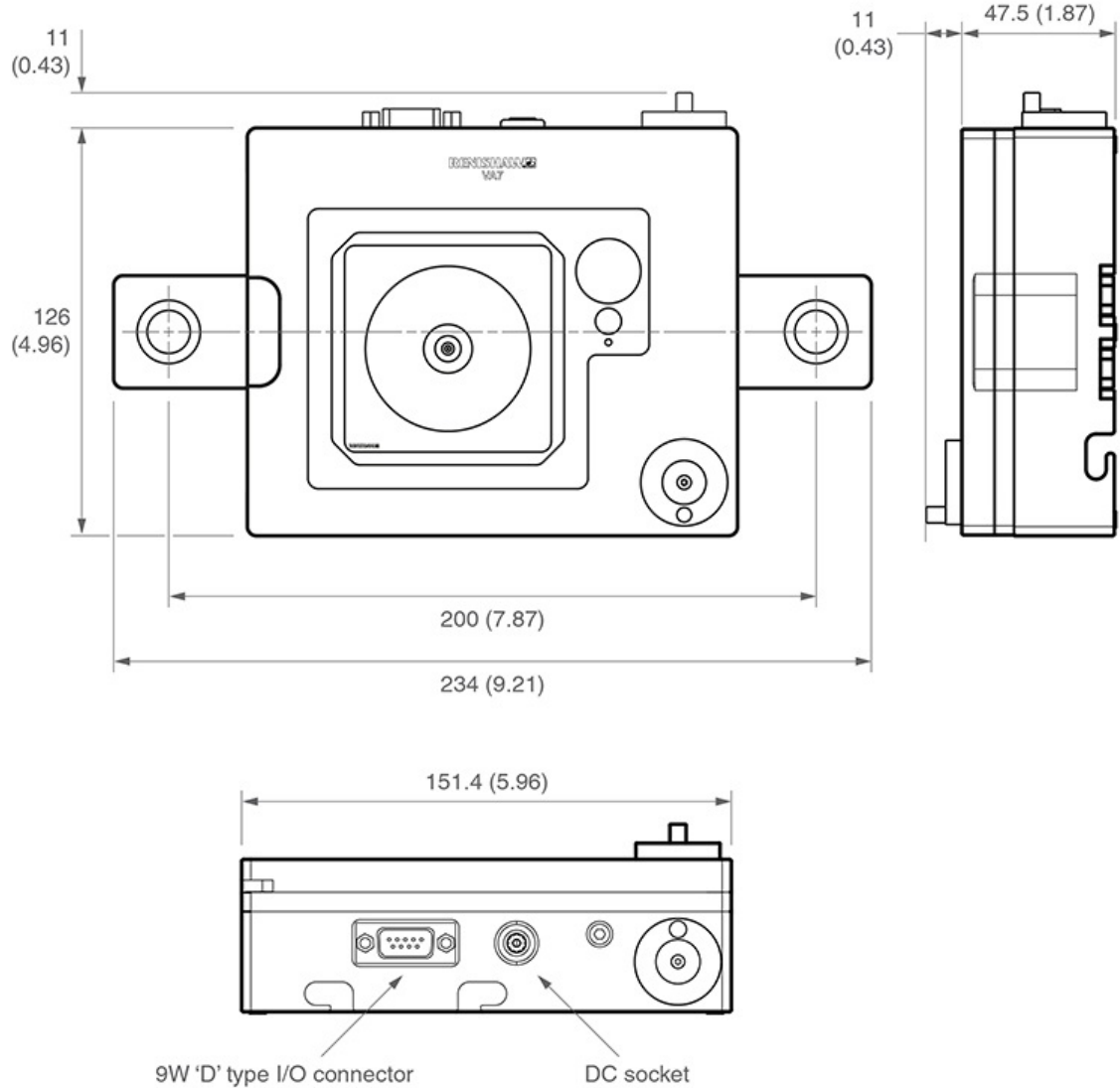
Thermal stability

It is recommended the VA7 is switched on 1.5 hours before use. This will allow the artefact to reach a stable temperature and ensure repeatable measurements. VA7 can also be left switched on continuously, ready for immediate use, however the high brightness of the LED backlight may be uncomfortable for the operator.

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VA7 dimensions



i NOTE: Dimensions in mm (in).

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VA7 installation

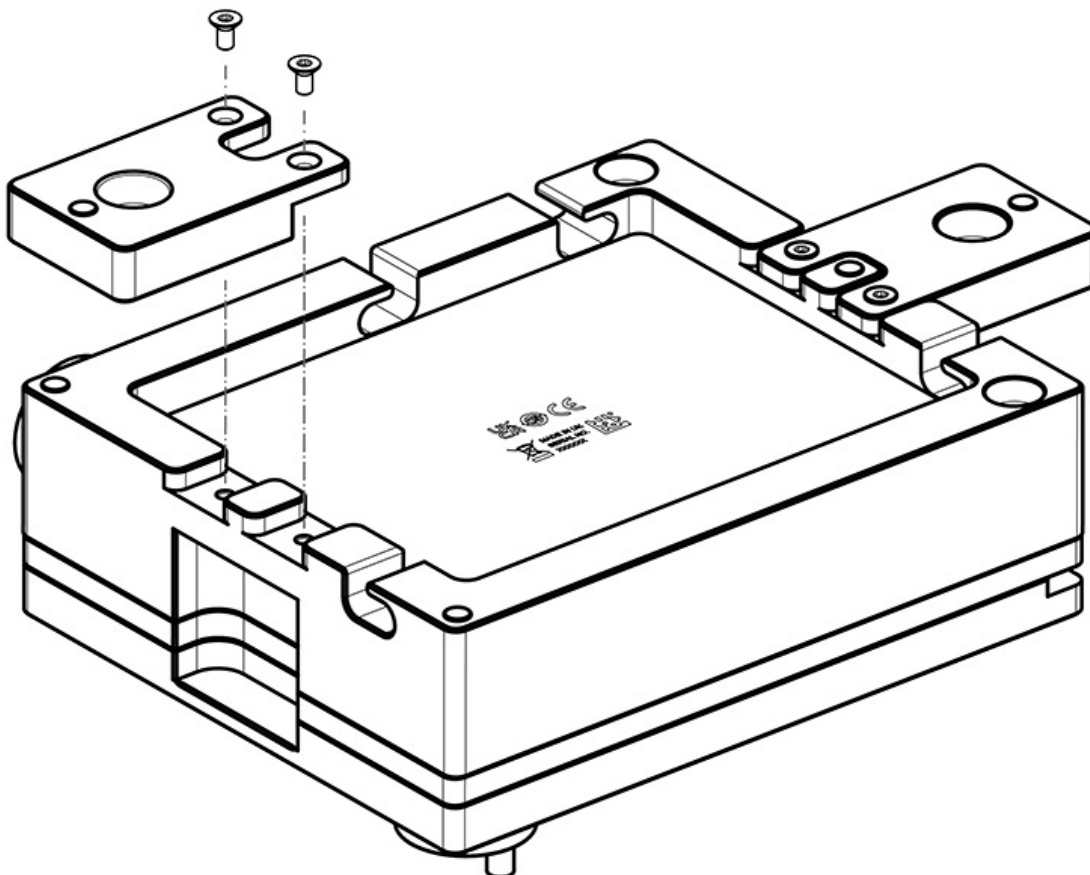
Fixing VA7 to the machine bed

The VA7 artefact is designed to be fixed securely to the bed of the machine. Bed clamps and mounting bolts are supplied in the kit for use with CMM frames with 100 mm separation of threaded inserts. For machine beds with different threaded insert separation, other suitable bed clamps can be used.

Fixing VA7 using supplied clamps

For CMM frames with 100 mm threaded insert separation, it is recommended to use the bed clamps supplied in the VA7 kit. The diagrams below show how to use the clamps.

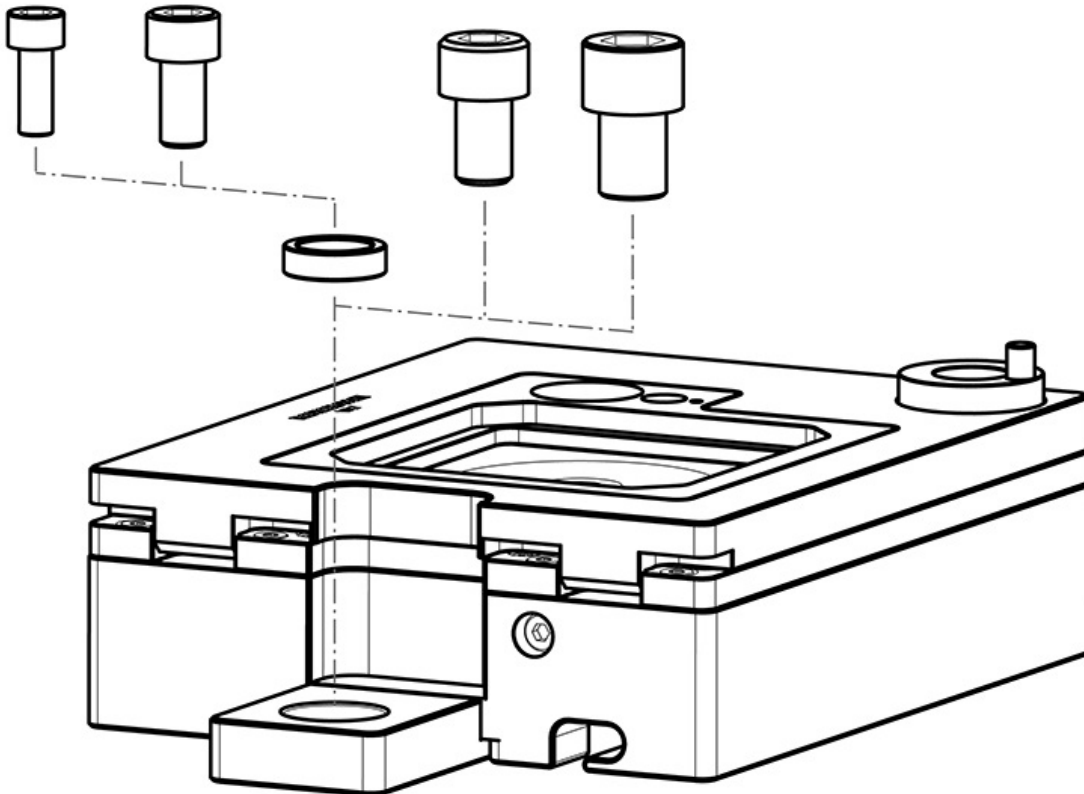
1. Attach the bed clamps to the VA7 artefact using the four off M3 countersunk screws provided.



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2. Affix the VA7 artefact to the machine bed using the M6, M8, M10 or M12 bolts provided. Washers are provided for use with the M6 and M8 bolts.

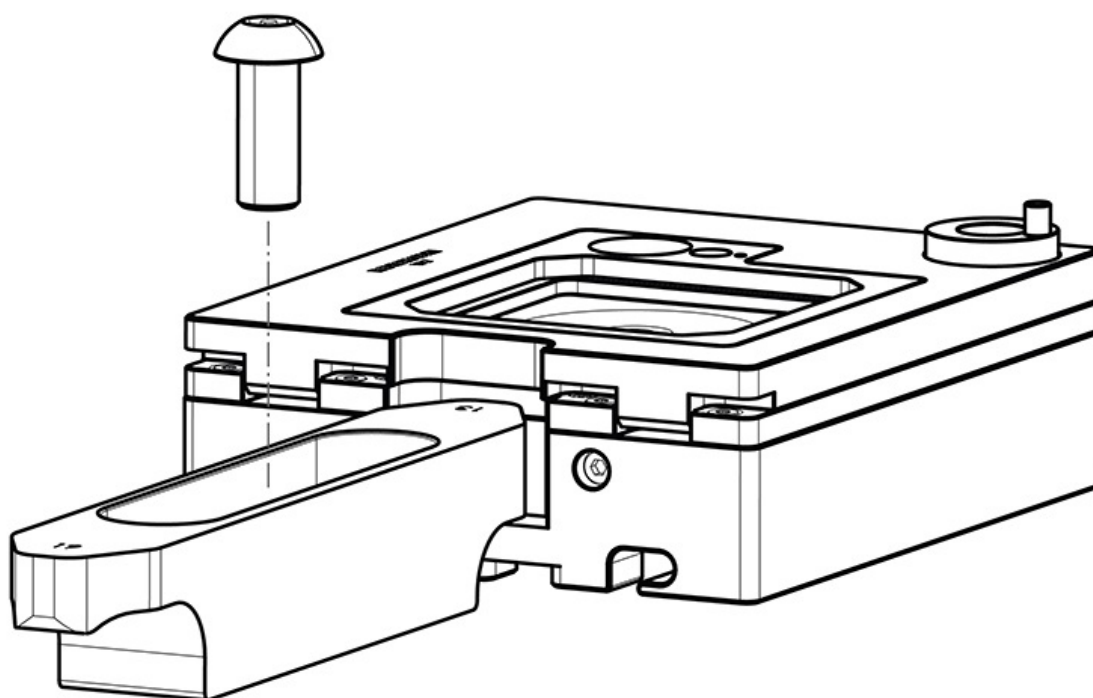


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Fixing VA7 using alternative CMM clamps

The VA7 artefact can be secured to the CMM bed with any suitable CMM clamp using the clamp slots on each side of the artefact. Renishaw recommend the use of the R-CPC-190 CMM plate clamp. The VA7 bed clamps should first be removed, if fitted, before using the plate clamps. The diagram below shows how to use the clamps.



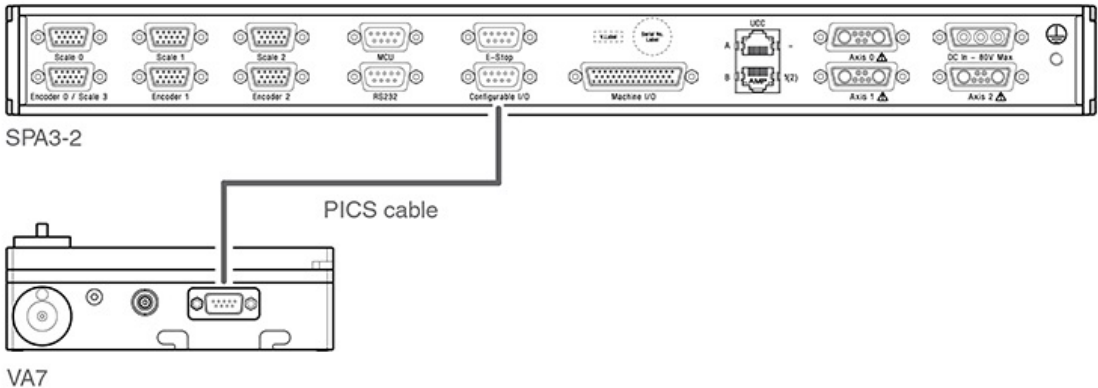
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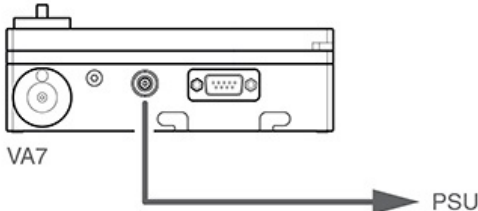
Connection diagram

The VA7 artefact should be connected as shown in the diagrams below. On an installation where a UCC AI / UCC BI is required, contact Renishaw for further information.

VA7 and SPA3-2:



VA7 and 24 VDC 70 W PSU connection:



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Cleaning the VA7 vision artefact

Following the simple procedures given below will prolong the operational life and maintain the high performance of the system. The user should determine the frequency of inspection and maintenance actions according to the conditions of use.



NOTE: Ensure the lightbox is switched off before cleaning the artefact.

The main body of the artefact should be carefully wiped with a lint free cloth.

The glass target should be cleaned using an optical lens cleaning kit to blow or brush debris away from the window.

If debris is still visible, then the glass should be carefully wiped with a lint free cloth or bud and high-purity isopropyl alcohol (IPA).

Extreme care must be taken to avoid damaging the chrome layer or scratching the glass. Nitrile gloves should be worn during the cleaning procedure and no attempt to directly touch the optical windows should be made.

The backlight and underside of the glass target can be accessed by lifting the glass retaining lid. The backlight surface should be cleaned using a lint free cloth.

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