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Renishaw multi-axis periscope (3-axis) RMAP-3A

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Legal information

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Equipment requiring attention under warranty must be returned to your equipment supplier.

Unless otherwise specifically agreed in writing between you and Renishaw, if you purchased the equipment from a Renishaw company, the warranty provisions contained in Renishaw's CONDITIONS OF SALE apply. You should consult these conditions in order to find out the details of your warranty but, in summary, the main exclusions from the warranty are if the equipment has been:

- neglected, mishandled or inappropriately used; or
- modified or altered in any way except with the prior written agreement of Renishaw.

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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.

RoHS compliance

Compliant with EC directive 2011/65/EU (RoHS)

Packaging component	Material	ISO 11469	Recycling guidance
Outer box	Cardboard	N/A	Recyclable
Inserts	Low density polyethylene	LDPE	Recyclable

Care of equipment

Renishaw RLE fibre optic laser encoders and associated products are precision components and must therefore be treated with care. For further information refer to Appendix B.

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Contents

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Product overview

Introduction

The multi-axis periscope has been designed to enable three RLD10-X3-DI detector heads to measure the linear position, pitch and yaw along a single axis. To achieve this, the multi-axis periscope uses a series of mirrors to minimise the beam foot print from the three detector heads thus reducing the size of the target mirror required for these applications. This compact periscope, which is designed to be mounted directly onto the exterior of the vacuum chamber, increases the measurement flexibility of the RLD10-X3-DI detector head.

Application overview

Storage and handling

The multi-axis periscope can be stored at temperatures between -20 °C and +70 °C. Do not store the multi-axis periscope in conditions of high humidity or otherwise subject it to conditions which may cause condensation to form on the optics.

Renishaw's fibre optic laser encoders and associated equipment are precision optical and electronic tools used for obtaining precise measurements and must therefore be treated with appropriate care.

Ensure protection is provided for both the RLE and the associated optics when transporting a machine with the equipment already installed.

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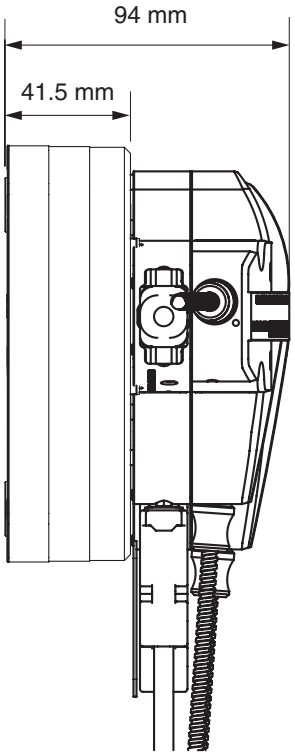
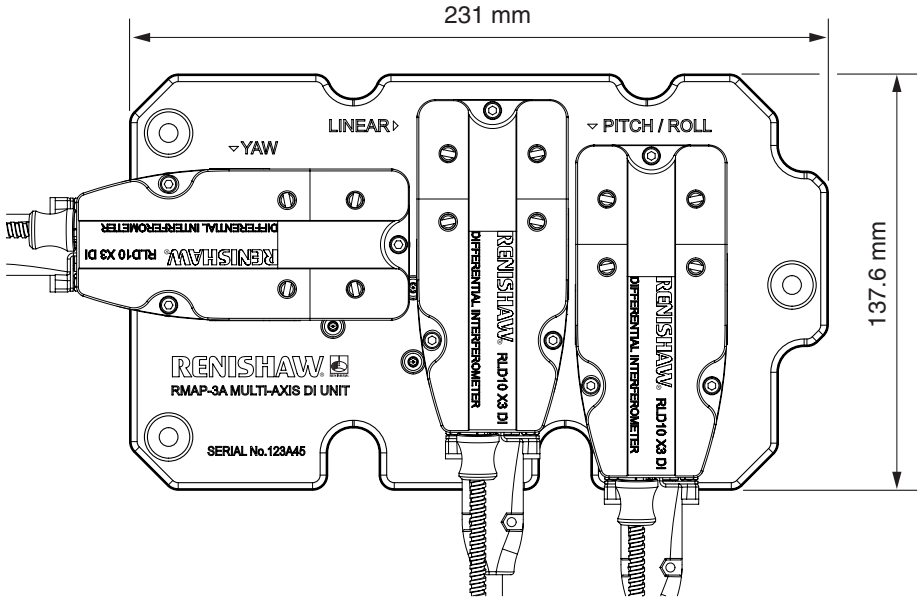
Dimensions and beam foot prints

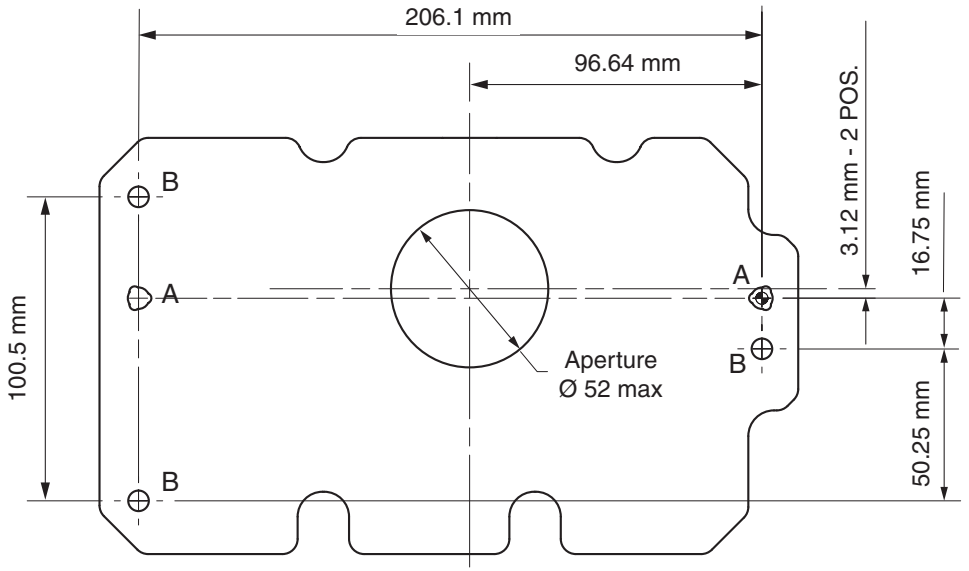
Hardware dimensions



SIDE VIEW



FRONT VIEW



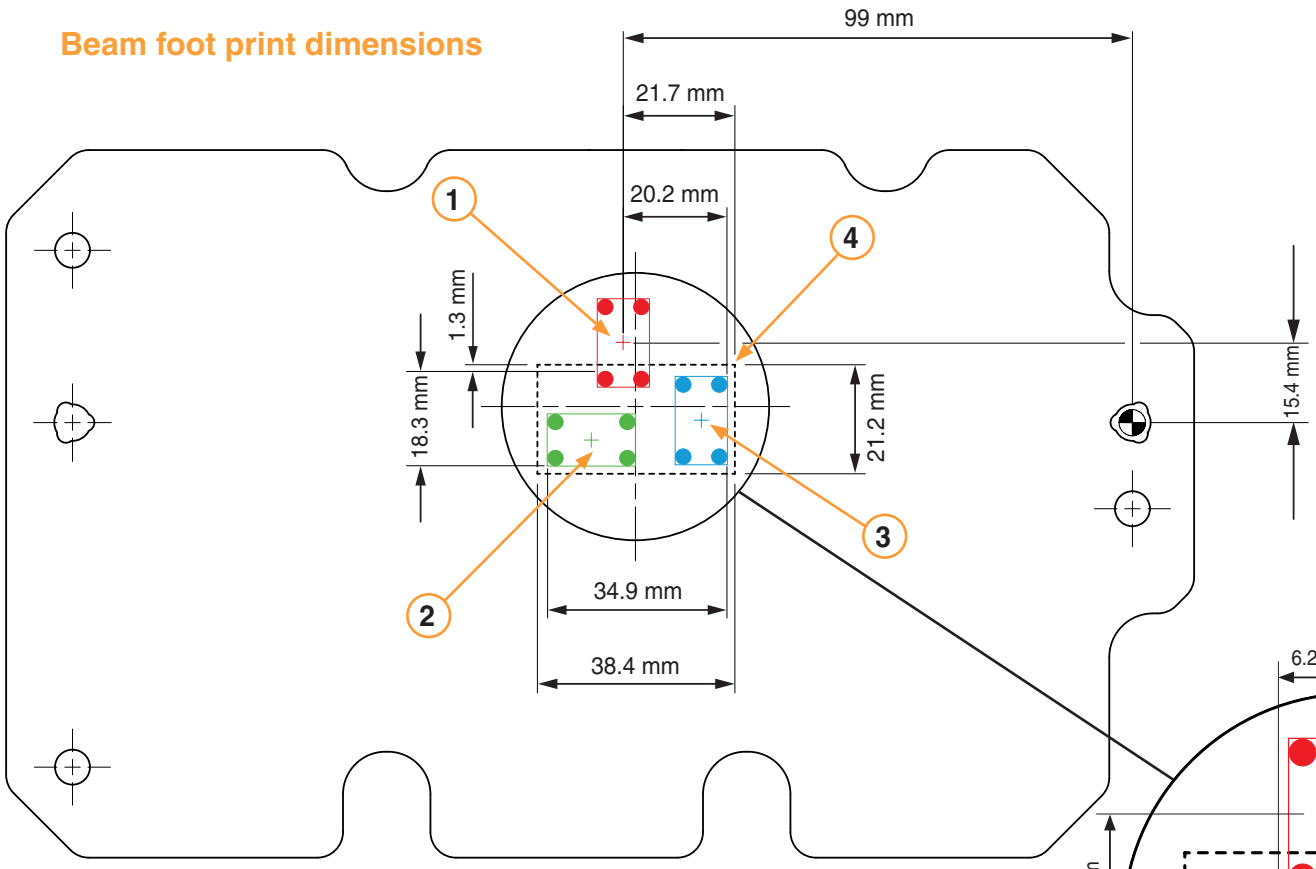
VIEW LOOKING
INTO CHAMBER

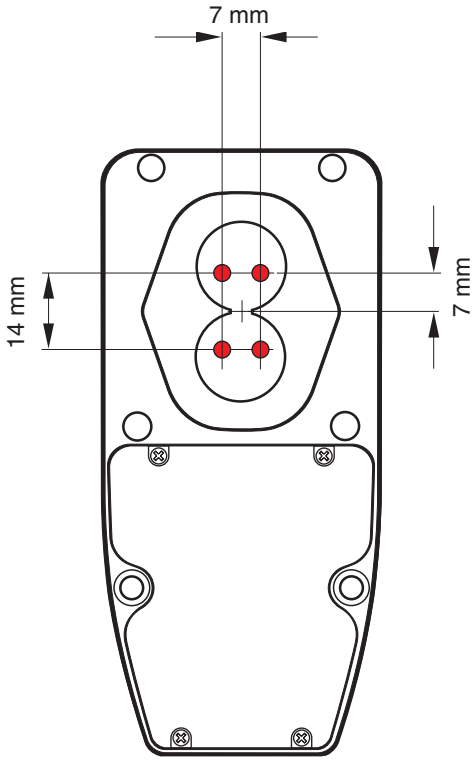
HOLES:

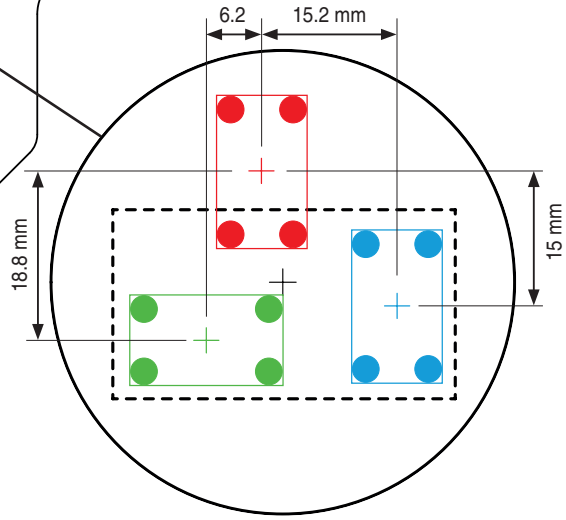
'A' 6 MM LOCATION DOWELS
'B' M6 X 40 SCREWS

Dimensions and beam foot prints

Beam foot print dimensions





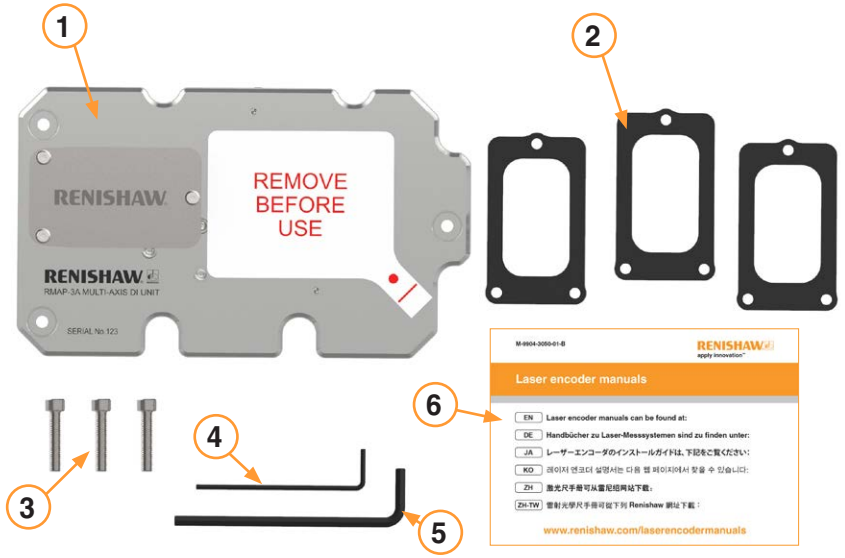


●	1	Linear measurement beams
●	2	Yaw measurement beams
●	3	Pitch/roll measurement beams
	4	Minimum stage mirror size

Kit contents

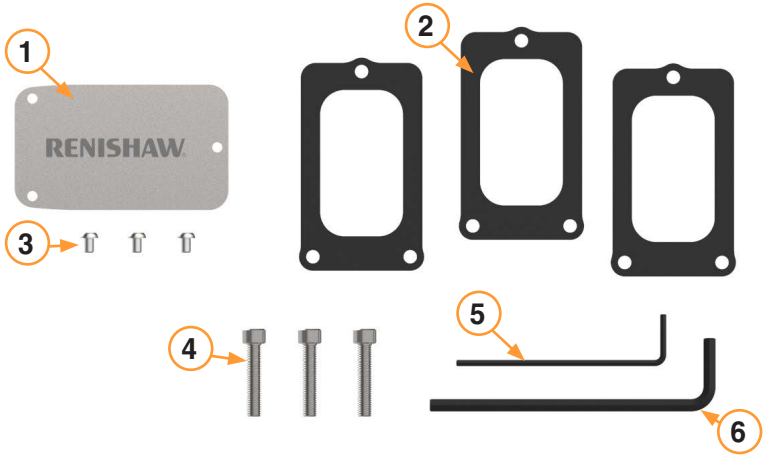
A-5225-0935 - RMAP-3A Multi-axis periscope kit

	Part number	Description	Quantity
1	A-5225-0870	RMAP-3A Multi-axis DI unit	1
2	M-5225-0883	Air turbulence gasket – multi head	3
3	P-0109-0109	Screw Hex Skt Cap Hd M6 x 40 – A2-70	3
4	P-TL01-0250	Wrench Hex S6 2.5 mm A/F	1
5	P-TL01-0500	Wrench Hex 5 mm A/F	1
6	M-9904-3050	Laser encoder manual card	1

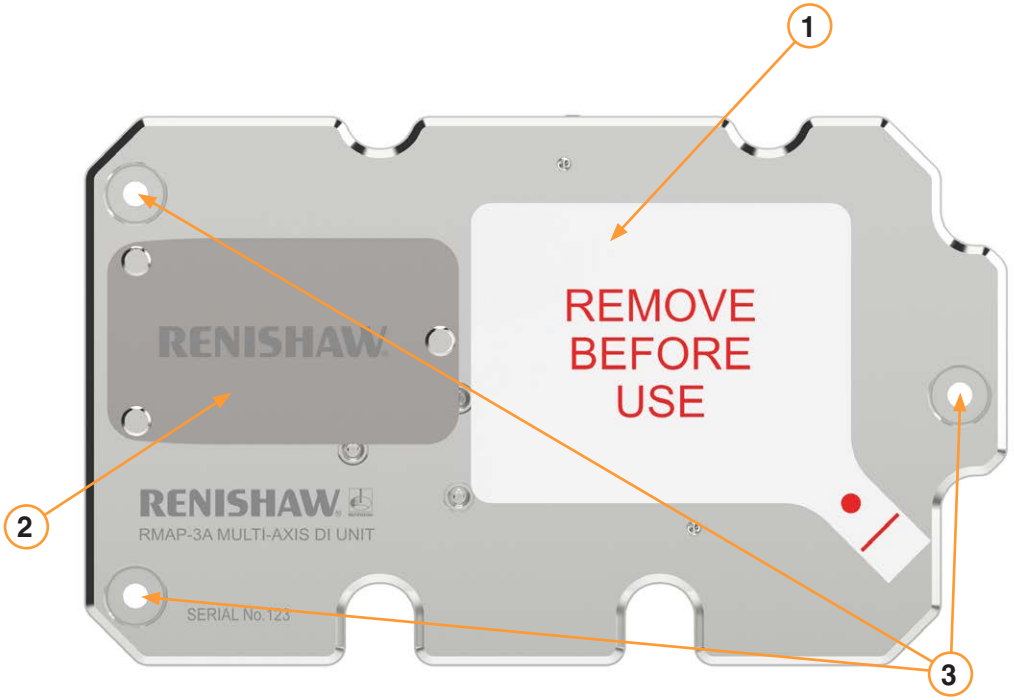


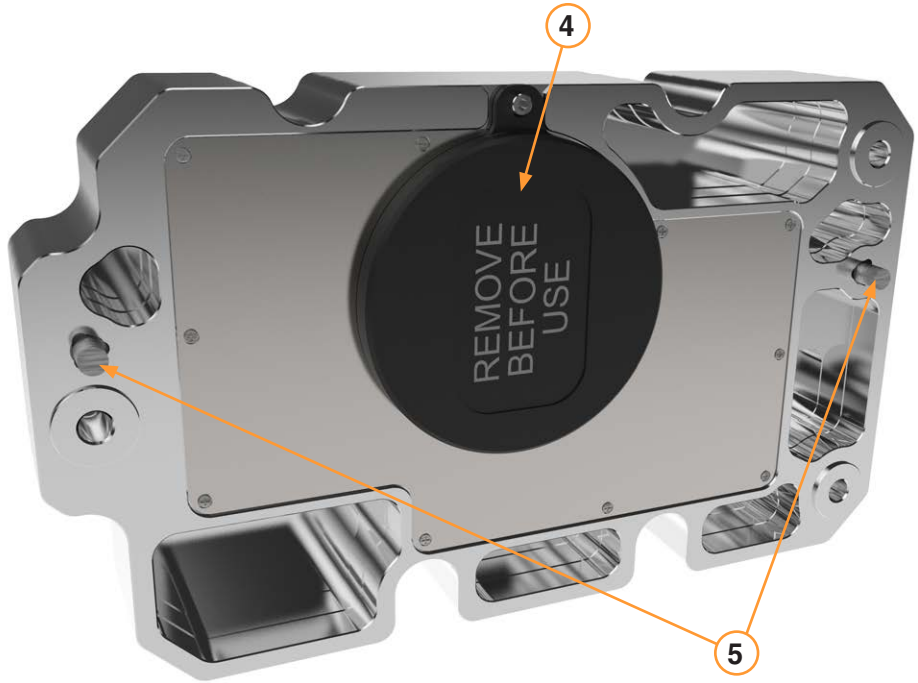
A-5225-0938 - Multi-axis periscope spares kit

	Part number	Description	Quantity
1	M-5225-0892	DI blanking plate	1
2	M-5225-0883	Air turbulence gasket – Multi head	3
3	P-SC17-0026	Screw Hex Skt Button Hd M4 x 6 – A2	3
4	P-SC01-0109	Screw Hex Skt Cap Hd M6 x 40 – A2-70	3
5	P-TL01-0250	Wrench Hex S6 2.5mm A/F	1
6	P-TL01-0500	Wrench Hex 5mm A/F	1



Mounting the periscope





1	Protective label
2	Removable blanking cover (to be kept in place when no yaw measurement is required)
3	M6 through hole for fixing the periscope

4	Protective cover
5	Vacuum chamber mounting pins

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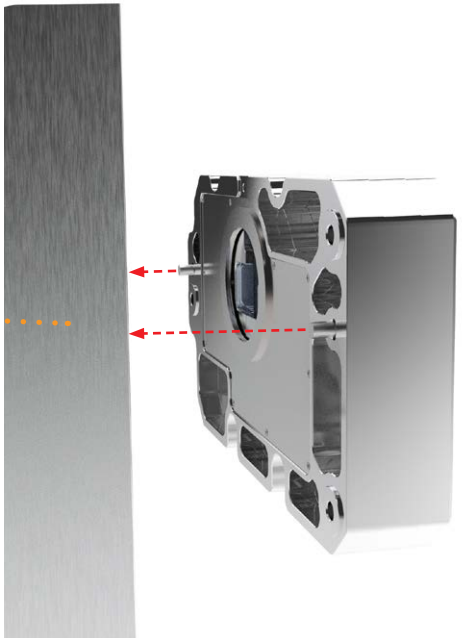
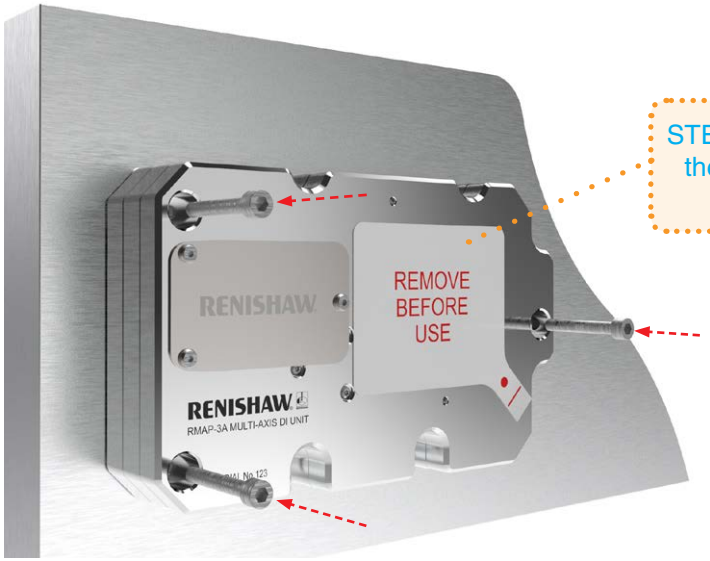
Mounting the periscope

STEP 1 - Remove protective cover

STEP 2 - Locate the multi-axis periscope onto the chamber using the mounting pins

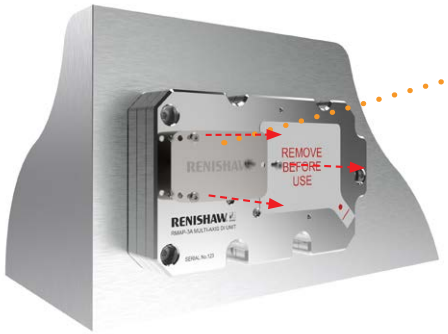


STEP 3 - Fit the periscope to the vacuum chamber using the 3 off M6 bolts provided (Take care not to exceed a maximum torque of 8 Nm)



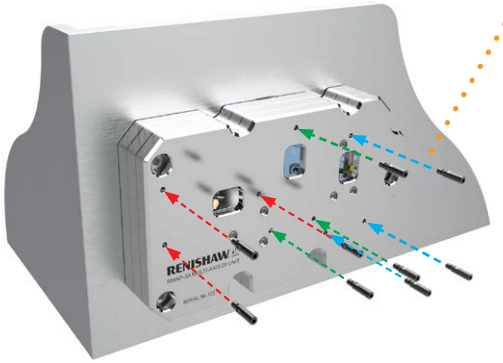
Note: For advice on care and handling please refer to Appendix B.

Mounting the RLDs



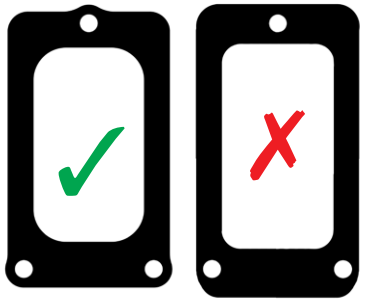
STEP 1 - Remove blanking cover and gasket if the yaw interferometer will be used

STEP 2 - Remove protective label from the front of the multi-axis periscope



STEP 3 - Fit the RLD10-X3-DI mounting pins (supplied with the RLD10-X3-DI) to the mounting pin locations on the front of the multi-axis periscope

STEP 4 - Fit the M-5225-0883 gaskets that are provided within the multi-axis periscope kit and not the standard DI-head gasket supplied with the head. NOTE: Ensure that the gasket is not damaged and sits flat against the housing prior to installing the head.



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Mounting the RLDs

STEP 5 - Fit the RLD10-X3-DI heads to the multi-axis periscope using the instructions in the RLE installation guide (M-5225-0568).

STEP 6 - Alignment of RLD10-X3-DI. When aligning the RLD10-X3-DI heads, please follow the process in the RLE installation guide (M-5225-0568).

Note: It is recommended that the linear head is installed first.

Appendix A - Specification

System specification		
Linear range	With RLD10-X3-DI	0 m to 0.65 m
Angular range	Pitch	±30 arcsec
	Yaw	
Analogue signal period	Linear	Same as standard RLD10-X3-DI
	Pitch	2.3 arcsec
	Yaw	
Thermal drift coefficient	Linear	Same as standard RLD10-X3-DI
	Pitch	<1.8 arcsec / °C
	Yaw	
Beam steering adjustment range	With RLD10-X3-DI	Reduced to ±0.5°
Change in signal strength through periscope (relative to linear)	Linear	No change
	Pitch	<10%
	Yaw	

Operating environment		
Pressure	Normal atmospheric 600 mbar – 1150 mbar	
Humidity	0% to 95% RH (non-condensing)	
Temperature	Storage	-20 °C to 70 °C
	Operating	10 °C to 40 °C

Weight and dimensions		
Weight	Packaged	2.2 kg approx
	Unpackaged	2 kg approx
Multi-axis periscope foot print	Height	137.6 mm
	Length	231 mm
	Width	41.5 mm
Beam foot print	Linear	7 mm x 14 mm (to centres of beams) Beam Ø 3mm (nominal)
	Pitch	
	Yaw	

Appendix B - Care and maintenance

Care and handling

- The protective cover is only removed just before installation to reduce the risk of contamination.
- The protective label is only removed just before installation of the heads onto the periscope to minimise the risk of contamination.
- Care should be taken when handling the periscope to ensure that fingers or other materials do not enter the aperture.

Cleaning

- It is not recommended that the mirrors are cleaned If the mirrors become contaminated, the multi-axis periscope should be returned to Renishaw to be correctly cleaned.
- Using compressed air is not recommended as this can cause condensation residue to form on the mirror.
- When cleaning the housing, care should be taken to ensure cleaning liquids or materials do not enter the housing.

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