

Author

Allan DeMello

Department

Mechanical Engineering

Date

01/31/03

Program - Project - Job: ALS – BM Beamlines
 BL 12.3.1 End Station
 Detector Support

Title: **Detector Support Assembly Procedure**

A. Assembly of the Gantry Guide Raft

I. Assemble Linear Rails to Gantry Guide Raft Weldment

1. Lay the Gantry Guide Raft Weldment (see drawing 26A514 item 1) onto a flat surface and jack (or shim) until the surfaces that the linear rails mount to are flat.
2. Install the linear rails (with their associated cars) following the “Linear Motion Guide Mounting Procedure” in Appendix A section of this document.
3. Mount the Carriage Weldment Assembly onto the linear rail cars.
4. Using an indicator mounted onto the Gantry Guide Raft Weldment sweep the Carriage in until it is parallel with the linear rails. Snug down the mounting bolts.
5. Check that the Carriage is centered between the rails.
6. After confirmation of the Carriage location tighten all mounting bolts.
7. Slide the Carriage along the full length of the rails to confirm that the motion is free with no drag anywhere in its travel.
8. Measure the running accuracy following the “Linear Motion Guide Mounting Procedure” document.

II. Assemble Ball Screw to Gantry Guide Raft Weldment

1. Mount the Bearing Support Subframe, Horz. Plate (see drawing 26A514 item 6) onto the Bearing Support Sub-frame Weldment (see drawing 26A514 item 4) using the 3/8 shoulder Socket Head Cap Screws (SHCS). **NOTE: Use silver grease on the shank and the threads of the four 3/8 shoulder bolts (stainless on stainless).**
2. Mount the Bearing Support Sub-frame Weldment to the Gantry Guide Raft Weldment using (6) 5/16-18 Socket Head Cap Screw (SHCS) with a flat and lock washers. Let the support hang at its lowest position in the slotted holes. Be sure the horizontal plate (Item 6) is mounted with the bolts loose.
3. Mount Ball Screw Bearing Mount (see drawing 26A514 item 3) to the Bearing Support Subframe, Horz. Plate. Finger tighten the (4) 3/8-16 SHCS.
4. Place the Upstream Bearing Mount Shim (see drawing 26A514 item 11) onto the upstream bearing mount plate.
5. Mount the other Ball Screw Bearing Mount to the upstream mounting plate on top of the shims. Finger tighten the (4) 3/8-16 SHCS.
6. Mount the ball nut/screw to the Ball Nut Mounting Bracket (26A390). **NOT SHOWN**
7. Mount the ball screw/nut/mounting bracket onto the carriage making sure that the ends of the screw go through the bearing mounts. Snug the bolts of the ball nut mounting bracket. **NOT SHOWN**
8. Align the ball nut bracket to the center of the carriage in the X direction (see 26A514 for coordinate directions) and tighten the (4) 3/8-16 SHCS. **NOT SHOWN**
9. Mount the ball screw bearings onto the ends of the screw and into their Ball Screw Bearing Mount. Raise the downstream support frame until the bearing is in alignment with the Ball Screw Bearing Mount. Watch that the upstream alignment is O.K. and that the bearing does not bind in the bearing mounting bracket.
10. Clamp the ball screw to the bearings with the retaining nuts.
11. Move the Carriage, by turning the screw, all the way upstream and allow the bearing mount bracket to “float” into alignment with the nut and screw. If the shims are too thick then trim them to fit. If the shims are too thin then add shim stock to make up the difference.

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- 12 Finger tighten the SHCS of the upstream bearing mounting bracket.
13. Move the Carriage all the way to the downstream position and adjust the downstream bearing support weldment (26A374) in the Y-direction (see 26A514 for coordinate directions) until the bearing bracket is supported. Finger tighten the (6) 5/16-18 SHCS.
14. Move the Carriage to the center position of its travel.
15. As a check use a dial indicator to measure the height of the ball screw in the area of the ball nut then measure the height of the screw at the two bearing ends and adjust the mounting support (downstream) or the shims (upstream) until the screw is in alignment.
16. Using a dial indicator measure the side to side (center) position of the ball screw in the area of the ball nut. Now measure the side to side (center) position of the screw at the two bearing ends of the screw and adjust the mounting supports (downstream and upstream) in the X-direction (see 26A514 for coordinate directions) until the screw is in alignment with the linear rails.
17. Tighten all bolts and recheck the alignment of the screw.

III. Assemble Compumotor to the Ball Screw

1. Place the (4) Compumotor Mounting Bracket Shims (see drawing 26A514 item 10) onto the mounting plate on the gantry raft.
2. Place the Compumotor Mounting Bracket Assembly (see drawing 26A514 item 5) onto the shims and bolt finger tight with the (4) 3/8-16 SHCS of the motor mount.
3. Place the Compumotor into the mounting bracket and tighten the (4) 10-32 SHCS mounting bolts.
4. Using an indicator align the motor shaft with the end of the ball screw. Grind the shims if they are too thick or use additional shim stock if the shims are too thin.
5. When the shafts are in alignment fully tighten the (4) 3/8-16 SHCS.
6. Take the motor out of the mount and install the Rimtec Bellows Coupling (see drawing 26A514 item 15) onto the shaft of the ball screw.
7. Place the Compumotor back into the mounting bracket.
8. Start to tighten the locking bolts on the coupling (motor side) until they are just starting to stop the coupling from sliding on the motor shaft.
9. Adjust the coupling on the two shafts until it is centered on the two shafts. Tighten the locking bolts (motor side) until tight. Tighten the locking bolts (ball screw side) until tight.

B. Assembly of the Gantry Guide Raft Weldment to the Main Frame

1. Level the top mounting pads of the Main Frame Weldment (see drawing 26A514 item 2) by jacking and shimming the bottom (floor) mounting plates.
2. Place the Gantry Raft Mount Shim Plates (see drawing 26A514 items 7, 8 & 9) onto the Main Frame Weldment (see drawing 26A514 item 2).
3. Gently lift the Gantry Guide Raft Weldment assembly and place it onto the Main Frame Weldment .
4. Install the (4) Washer Plates (see drawing 26A514 item 13) in to the four corners of the rectangular tubing of the Gantry Guide Raft Weldment .
5. Install the (16) 1/2-13 SHCS with the (16) 1/2" lock washers through the four corner mounting plates of the Gantry Guide Raft Weldment , through the shims and into the Main Frame Weldment .
6. Install the (16) 3/8-16 SHCS with the (16) 3/8" lock washers and flat washers through the center mounting plates of the Gantry Guide Raft Weldment , through the shims and into the Main Frame Weldment .
7. Check the linear rails to determine that they are still flat, parallel and at the correct height relative to the beamline.
8. Adjust the raft to frame shims if adjustments in the height of the rails is necessary.
9. Check the location of the shims to be certain that they line up with the outer surfaces of the plates on the raft and frame.

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Allan DeMello

Department

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C. Assembly of the Renishaw Encoder to the Gantry Guide Raft Weldment

- 1) Mount the two parts of the mounting hardware (26A391 and 26A392) to the Carriage Weldment Assembly (see 26A514 for an illustration).
- 2) Mount the Renishaw Scale Applicator Tool to the encoder mounting plate in the position of the encoder following Renishaw Scale Guide RGA245 in [Appendix B](#)
(or at http://www.renishaw.com/client/ProdCat/prodcat_levelfour.asp?ID=876&Name=RGH24-25-applicators)
- 3) Mount the Renishaw Encoder to the encoder mounting plate following Renishaw RGH24/25 Installation Guide in [Appendix B](#)
(or at http://www.renishaw.com/client/ProdCat/prodcat_levelfour.asp?ID=876&Name=RGH24-25-applicators)

D. Assembly of the Euchner Limit Switch to the Gantry Guide Raft Weldment

- 1) Mount the Euchner limit switch trip dog rails (26A372) to the Gantry Guide Raft Weldment (see 26A514 for an illustration).
- 2) Mount the Euchner limit switch mounting plate (26A373) to the Carriage Weldment Assembly (see 26A514 for an illustration).
- 3) Mount the Euchner limit switch to the Euchner limit switch mounting plate (26A373) (see 26A514 for an illustration).
- 4) Mount the Euchner limit switch trip dogs to the trip dog rails (see 26A514 sheet 3, ISO view for trip dog positions).

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APPENDIX A

Linear Motion Guide Mounting Procedure

(from THK Co. Ltd. - http://www.calsmall.ne.jp/THKCat_en/tocf_THK.htm)

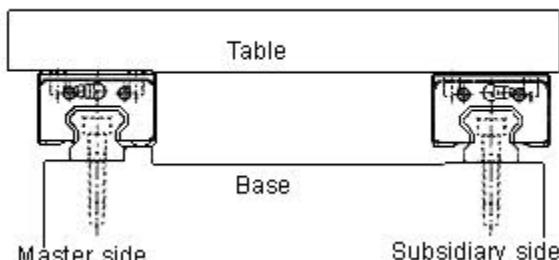


Fig. 1 Mounting Schematic

Mounting the master LM rail

- Prior to assembly, always remove all burrs, dents, dust, and the like from the mounting surface of the machine on which the LM Guide is to be installed (Fig. 2).

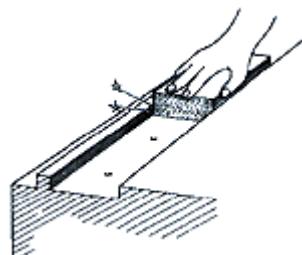


Fig. 2 Checking the Mounting Surface

CAUTION: The LM Guide is delivered with an anticorrosive oil applied. Prior to assembly, be sure to remove the oil from the reference surface using a wash oil. If the anticorrosive oil is removed, the surface is likely to rust. The application of a low-viscosity spindle oil or the like is therefore recommended.

- Gently place an LM rail on the base, and temporarily tighten the bolts so that the rail lightly contacts the mounting surface. (Hold the line-marked side of the LM rail against matching the base-side reference surface.) (Fig. 3)

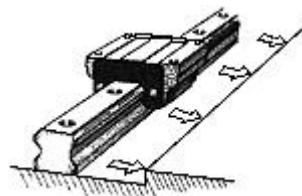


Fig. 3 Holding an LM Rail against the Reference Surface

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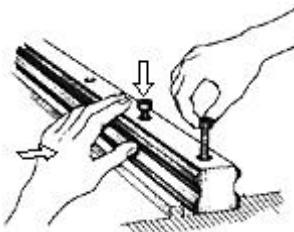
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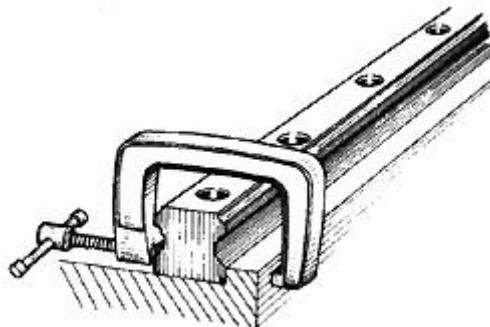
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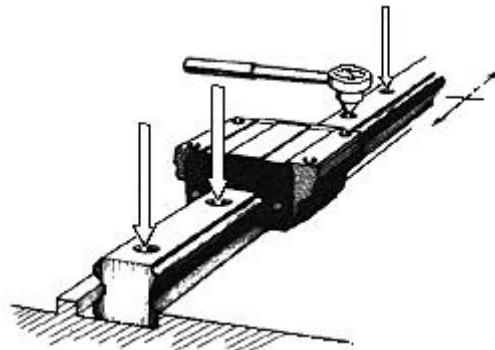
CAUTION: Use clean bolts to fasten the LM Guide. When inserting bolts into the LM-rail mounting holes, make sure the threads of the bolt and nut are properly aligned (Fig. 4). Forcing a bolt into a misaligned hole results in accuracy degradation.

**Fig. 4 Checking Bolt Play**

- 3) After temporarily tightening the mounting bolts, use a small vise or the like to firmly press the rail to the side, against the reference section. Fully tighten the mounting bolts. Repeat this for each mounting bolt in sequence (Fig. 5).

**Fig. 5 Clamp the rail to the datum surface**

- 4) Using a torque wrench, tighten the mounting bolts to the specified torque (Fig. 6; see Tables 1 below).

**Fig. 6 Full Tightening of Mounting Bolts**

CAUTION: The sequence for tightening the LM-rail mounting bolts should start from the center to the end. Following this sequence enables stable accuracy to be achieved.

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Unit: N-cm

Model	Tightening torque		
	Iron	Casting	Aluminum
M 2	58.8	39.2	29.4
M 2.3	78.4	53.9	39.2
M 2.6	118	78.4	58.8
M 3	196	127	98.0
M 4	412	274	206
M 5	882	588	441
M 6	1370	921	686
M 8	3040	2010	1470
M 10	6760	4510	3330
M 12	11800	7840	5880
M 14	15700	10500	7840
M 16	19600	13100	9800
M 20	38200	25500	19100
M 22	51900	34800	26000
M 24	65700	44100	32800
M 30	130000	87200	65200

Table 1 Tightening Torque for Hexagonal-Socket Head Bolts

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Mounting the subsidiary LM rail

To ensure parallelism of the subsidiary LM rail with the master LM rail properly mounted, the following methods are recommended:

*** Use a straight edge.**

Position a straight edge between the two rails so that it is parallel with the master-LM rail side reference surface, and confirm parallelism using a dial gauge. Using the straight edge as a reference, confirm subsidiary-rail straightness from one end to the other, tightening the mounting bolts in sequence as you go (Fig. 7).

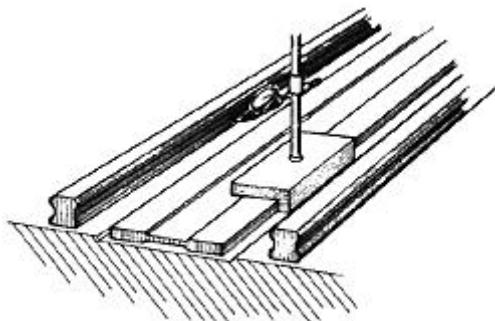


Fig. 7

*** Move the table.**

Fasten two LM blocks on the master side to the table (or a temporary measurement table). Temporarily fasten the subsidiary LM rail and block to the base and table. From the dial-gauge stand, have a dial gauge contact the subsidiary-rail LM-block side. Move the table from the rail end and check the parallelism between the block and the subsidiary LM rail, fastening the bolts in sequence as you go (Fig. 8).

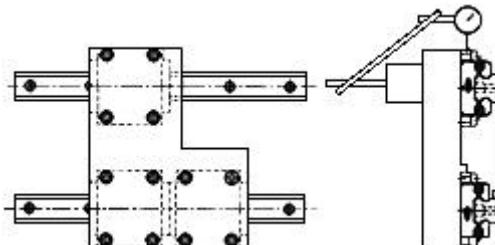


Fig. 8

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Mechanical Engineering Date
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*** Compare to the master LM rail.**

Make sure the master LM rail is properly installed. Temporarily fasten the subsidiary LM rail in place. Place a table on the LM blocks mounted on the master rail and on the temporarily fastened subsidiary LM rail. Fully tighten the mounting bolts on the two LM blocks on the master rail, and one of the two LM blocks on the subsidiary rail. With the remaining LM block on the subsidiary rail temporarily fastened, correct the position of the subsidiary LM rail, fully tightening its mounting bolts in sequence as you go (Fig. 9).

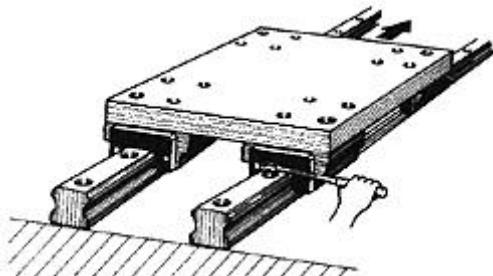


Fig. 9

*** Method using a jig**

Using a jig as shown in Fig. 10, confirm parallelism between the master-rail-side reference surface and that of the subsidiary LM rail.

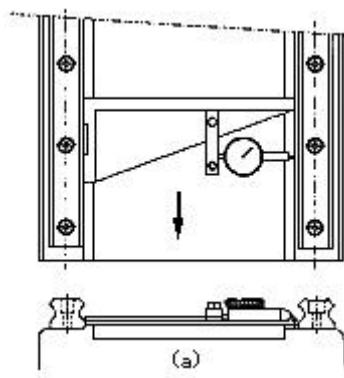


Fig. 10

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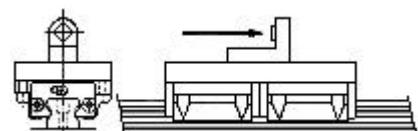
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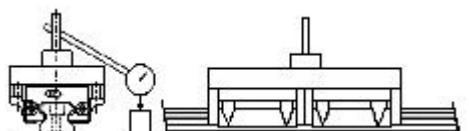
Measuring Accuracy after Installation

Measuring running accuracy on a rail

When the running accuracy of LM blocks is measured, stable accuracy can be obtained with two LM blocks fastened to an inspection plate, as shown in Fig. 11. If a dial gauge is used, position a straight edge as close to the subject LM block as possible. The closer it is, the more accurate measurement will be.



1) Measurement with the aid of an autocollimator



2) Measurement with the aid of a dial gauge

Fig. 11 Measuring Accuracy after Installation

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APPENDIX B



RGA245 scale guide

Scale applicator tool for RGH24 and RGH25 readhead installations

The RGA245 scale guide is mounted in place of any Ronichaw RGH24 or RGH25 readhead and uses the motion of the axis to apply RGS-S tape scale parallel to the guideway whilst simultaneously removing the backing paper - a one man, one hit operation.

Scale installation

- **Prepare scale and surface**
 - Ensure scale is cut to correct length and mounting surface has been prepared (refer to RGS-S scale installation guide for details)

- **Install the scale guide**
 - Mount the scale guide to the readhead bracket as shown in figure 1
 - Be careful to check that the readhead and the scale guide have the same orientation, as the readhead does not lie centrally over the scale
 - Move the guide to the start of axis travel. Note the direction of scale application as shown in figure 2

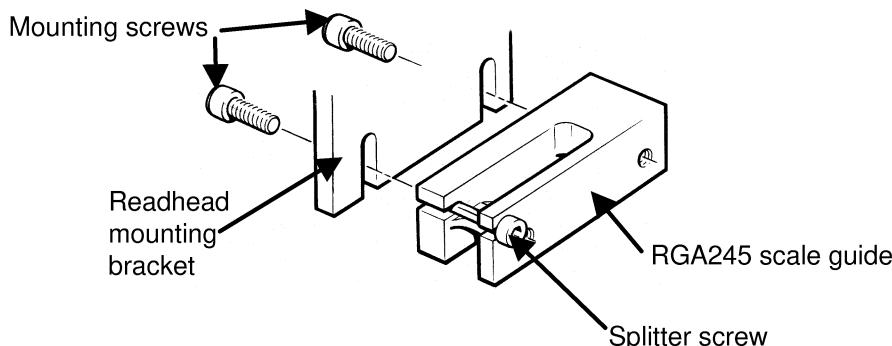


Figure 1

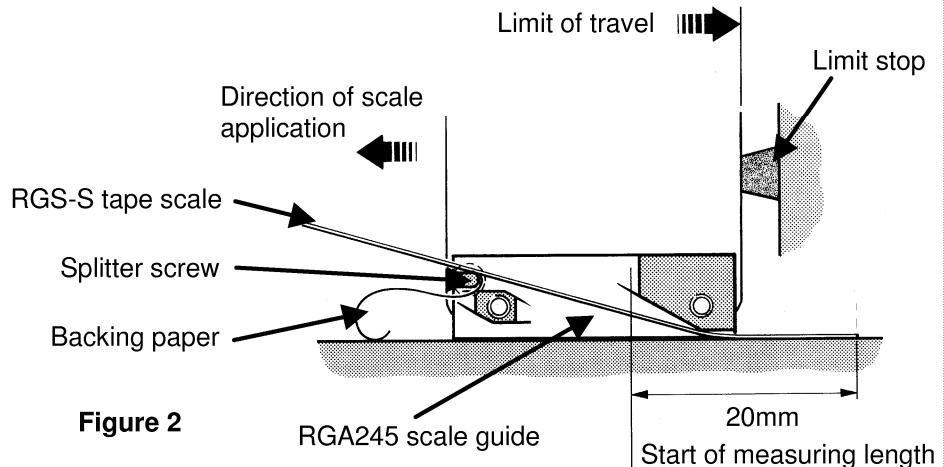


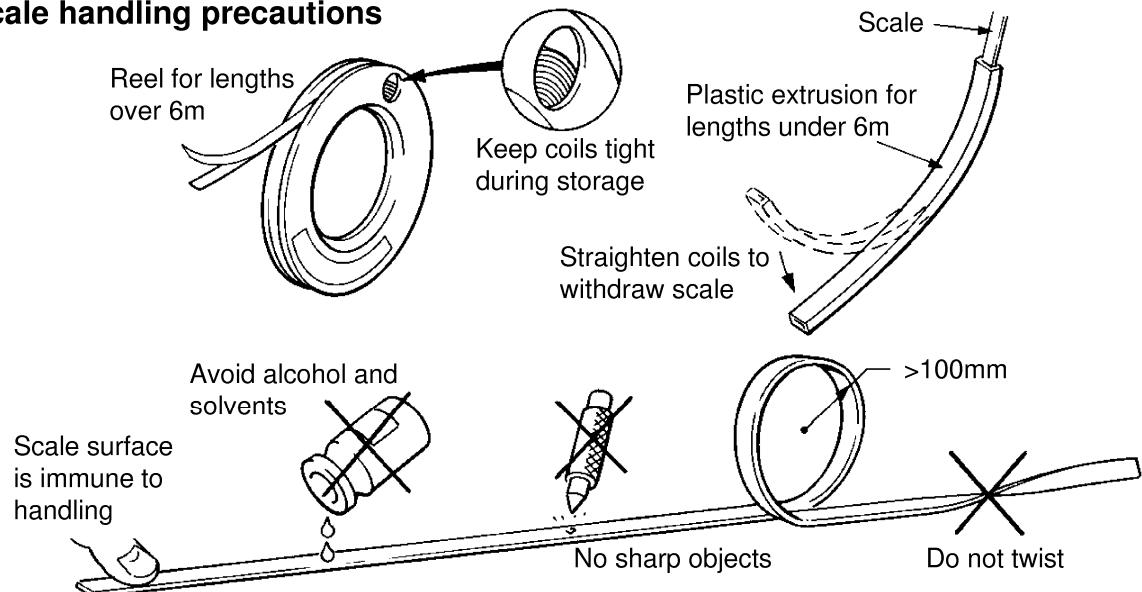
Figure 2

(continued overleaf)

REN ISH AW
INSTALLATION INSTRUCTION SHEET

- **Load the scale into the scale guide**
 - Remove the splitter screw (see figure 1) from the scale guide body
 - Separate the backing paper from the first 40mm of scale and feed it into the scale guide as shown in figure 2
 - Relocate the splitter screw behind the backing paper as shown in figure 2
 - Push the scale carefully through to the end of scale mark, ensuring that it does not stick to the mounting surface until it is in position. **NOTE** to prevent the scale sticking to the mounting surface during this operation it may be necessary to re-apply approximately 20mm of backing paper to the end of the scale before inserting through scale guide. This can then be removed before to fitting end clamps.
 - Attach the end of the scale to the mounting surface with light finger pressure
- **Apply the scale**
 - Traverse the axis through its full travel at a slow, steady speed
 - While moving the axis
 - Apply a light finger pressure to the scale behind the scale guide to attach it to the mounting surface
 - Gently pull the backing paper away from in front of the scale guide as it is separated
- **Remove the scale guide**
 - When the axis has reached the limit of its travel, lock the axis in place and unbolt the scale guide from the readhead mounting bracket
 - Withdraw the scale guide along the scale whilst applying the remaining scale using light finger pressure
- **Ensure complete adhesion** of the scale to the mounting surface by applying firm finger pressure along the full length of the scale from the centre outwards to each end
- **Fit RGC-F end clamps** (refer to RGS-S scale installation guide for details)

Scale handling precautions



DO NOT remove the scale for refitting or use elsewhere once it has been applied to the mounting surface. The scale can be applied once only.

RENISHAW

Renishaw plc

Encoder Products Division

New Mills, Wotton-under-Edge

Gloucestershire GL12 8JR, UK

Tel: +44 (0)1453 523 634
(07000 RENISHAW)

Fax: +44 (0)1453 523 760
E mail: encoder.products@renishaw.com
Internet: http://www.renishaw.com

USA, Renishaw Inc

Tel +1 847 843 3666
Fax +1 847 843 1744

France, Renishaw SA

Tel +33 1 64 61 84 84
Fax +33 1 64 61 65 26

Switzerland, Renishaw AG

Tel +41 55 410 66 66
Fax +41 55 410 66 69

Renishaw's Representative Offices

Peoples Republic of China, Beijing
Tel +86 10 6461 2689
Fax +86 10 6461 2687

Singapore

Tel +65 438 2778
Fax +65 438 4780

Indonesia, Jakarta

Tel/fax +62 21 424 3934
India, Bangalore (liaison office)
Tel/fax +91 80 224 3223

Japan, Renishaw KK

Tel +81 3 5350 2201

Fax +81 3 5350 2207

Italy, Renishaw SpA

Tel +39 11 9 66 10 52

Fax +39 11 9 66 40 83

Hong Kong, Renishaw (Hong Kong) Ltd

Tel +852 2753 0638

Fax +852 2756 8786

Germany, Renishaw GmbH

Tel +49 712 797 960

Fax +49 712 788 237

Spain, Renishaw Iberica SA

Tel +55 11 7295 2866

Fax +55 11 7295 1641

Brazil, Renishaw Latino America Ltda

Tel +55 11 7295 2866

Fax +55 11 7295 1641



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RGH24/25 Installation Guide

WARNINGS

GB
It is the responsibility of the machine manufacturer and/or encoder installer to ensure that, in safety critical applications of the RG2 and RG4 systems, any form of readhead signal deviation from the limits of the receiving electronics, howsoever caused, shall not cause the machine to become unsafe.
It is the machine supplier's responsibility to ensure that the user is made aware of any hazards involved in operation of their machine, including those mentioned in Renishaw product documentation, and to ensure that adequate guards and safety interlocks are provided.
Remove power before performing any maintenance or cleaning operations.

AVERTISSEMENTS

F
La responsabilité de veiller à ce que, dans le cadre d'applications des codeurs RG2 et RG4 où les considérations de sécurité doivent être impérativement prises en compte, toute forme de déviation du signal de tête de lecture par rapport aux limites des dispositifs électroniques récepteurs, quelle qu'en soit la cause, ne risque pas de compromettre la sécurité de la machine, incombe au fabricant de la machine et/ou à l'installateur du codeur.
La responsabilité de veiller à ce que l'utilisateur du système soit informé de tous risques associés à l'utilisation des machines, y compris les risques figurant dans la documentation afférente aux produits Renishaw et de vérifier que les dispositifs de protection et de verrouillage de sécurité appropriés ont bien été prévus, incombe au fournisseur de la machine.
Veiller à bien isoler les systèmes de la source d'alimentation avant de procéder à un travail d'entretien quelconque.

ACHTUNG

D
Es liegt in der Verantwortung des Herstellers der Maschine und/oder dem Nachrüster des Wegmess-Systems RG2 und RG4, dass bei einer sicherheitskritischen Anwendung der Systeme die Empfangselektronik keine Signalabweichung von den Spezifikationen verursacht, die zu einem unsicheren Betrieb der Maschine führen könnten. Es liegt weiterhin in der Verantwortung des Maschinen-Herstellers sicherzustellen, dass der Benutzer auf alle (einschließlich die in der Renishaw Produktdokumentation aufgeführten) Gefahrenereignisse beim Betrieb der Maschine hingewiesen wird. Ferner ist dafür zu sorgen, dass entsprechende Sicherheitsvorrichtungen vorhanden sind.
Schalten Sie vor Durchführung von Wartungs- oder Reinigungsarbeiten den Strom ab.

AVERTENZE

I
Il fabbricante della macchina e/o l'installatore del sistema dotato di decodificatore è responsabile di assicurarsi che, nel caso di applicazioni critiche dei sistemi RG2 e RG4, qualsiasi forma di deviazione, dovuta a qualsiasi causa, del segnale della testina di lettura dai limiti richiesti dal sistema elettronico a cui è diretto non renda la macchina insicura. Il fornitore della macchina è responsabile di assicurarsi che l'utente sia messo al corrente di qualsiasi pericolo connesso con il funzionamento della macchina, inclusi quelli menzionati nella documentazione Renishaw del prodotto, e di assicurarsi che siano fornite adeguate cuffie di protezione ed asservimenti di sicurezza.
Staccare la rete elettrica d'alimentazione prima di eseguire qualsiasi operazione di manutenzione o di pulizia.

ADVERTENCIAS

E
Es responsabilidad del fabricante de la máquina y/o el instalador del sistema codificador asegurarse de que, en las aplicaciones críticas de los sistemas RG2 y RG4 en las que resulta crítica la seguridad, ninguna forma de desviación de la señal de la cabeza de lectura de los límites de la electrónica receptora, sea cual sea la causa, hará que la máquina se vuelve peligrosa. Es responsabilidad del proveedor de la máquina asegurarse de que el usuario tenga conocimientos de cualquier peligro que implica la operación de su máquina, incluyendo los que se mencionan en la documentación sobre los productos Renishaw, y asegurarse de haber suministrado las defensas y dispositivos de interbloqueo adecuados.
Se debe cortar la corriente antes de realizar cualquier trabajo de mantenimiento o limpieza.

AVISOS

P
É a responsabilidade do fabricante da máquina e/ou instalador do sistema de codificação de certificar-se de que, em aplicações críticas de segurança dos sistemas RG2 e RG4, qualquer forma de desvio do sinal de cabeçote de leitura dos limites da electrónica receptora, independente do motivo, não afectará a segurança da máquina. É a responsabilidade do fornecedor da máquina de garantir que o utilizador esteja ciente dos perigos envolvidos na operação da máquina, a incluir os mencionados na documentação do produto da Renishaw e de certificar-se de que existem protectores e travas de segurança adequados.
Desligar a máquina antes de efectuar operações de manutenção ou limpeza.

EMC Compliance
The RG2 encoder system conforms to the relevant harmonised European standards for electromagnetic compatibility as detailed below.
BS EN 50081-2 Electromagnetic compatibility. Generic emission standard - Industrial environment.
BS EN 50082-3 Electromagnetic compatibility. Generic immunity standard - Industrial environment.
BS EN 55011 Specification for limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment.

Patents

Features of Renishaw's Encoder Systems and similar products are the subjects of the following patents and patent applications:

EP 0274491	EP 0207121	JP 1549396
US 4959542	JP 501381/88	EP 0383901
US 5,088,209	JP 2,963,926	US 4,974,962
JP 248,895/1993	EP 0543513	EP 0843159
EP 0274492	EP 0748436	US 4926566
EP 0826138	US 5,302,820	JP 506,211/1999
US 5,861,953	US 6,051,971	EP 0388453
JP 133,732/1993	US 5,241,173	JP 2837483
US5,063,685	EP 0514081	

Further information

For further information relating to the installation of RGH24/25 readheads, see also the RGH24 and/or the RGH25 datasheets (part numbers L-9517-0166 and L-9517-0168), and the Scale installation guide (part number M-9517-2855). These can be downloaded from our website www.renishaw.com/encoder and are also available from your local representative.

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ADVARSLER

DK
Maskinfabrikanten og/eller indkodningsoperatøren står ansvarlig for at sikre at sikkerheden opretholdes for RG2 og RG4's kritiske applikationssystemer, samt at alle former for afvigelse i læsesignalerne fra modtagerelektronikkens begrænsninger ikke gør maskinen usikker, uanset hvordan dette er opstået.
Maskinleverandøren er ansvarlig for at brugeren gøres bekendt med de risici der er involveret i betjening af maskinen, inklusive dem der er angivet i Renishaw's produktdokumentering, samt sikre tilstedeværelsen af forsvarlige sikkerhedsskærme og sikkerhedsdåse.
Inden der udføres nogen for vedligeholdelse eller rengøring, skal strømforsyningen frakobles.

WAARSCUHSGWINGEN

NL
De machinefabrikant en/of de installateur van het codeersysteem is ervoor verantwoordelijk dat bij de toepassing van de RG2- en RG4-systeem waar de veiligheid kritisch is, elk deviatie van het leeskopsignalen buiten de grenzen van de ontvangende elektronische apparatuur, ongeacht de oorzaak, de machine niet onveilig maakt.
De machineleverancier is ervoor verantwoordelijk dat de gebruikers van de mogelijk gevaaren bij het gebruik van hun machine bewust worden gemaakt, inclusief de gevaren die in de producdocumentatie van Renishaw vermeld staan, en tevens dat er voldoende afschermkappen en beveiligingschakelingen worden aangebracht.
Schakel eerst de stroom uit voordat u schoonmaak- of onderhoudswerkzaamheden uitvoert.

VARNING

SW
Det är maskintillverkarens och/eller givarsysteminstallatörens ansvar att se till att säkerheten inte äventyras i säkerhetskritiska tillämpningar av RG2 och RG4 om signalen från läshuvudet skulle avvika från vad den mottagande elektroniken klarar, hur detta avseckle är har uppstått.
Det är maskinleverantörens ansvar att se till att användaren är medveten om eventuella faror förbundna med användningen av maskinen, inklusive de som anges i Renishaws produktdokumentation, och att se till att lämpliga skydd och föregläningar finns.
Maskinen måste göras strömlös innan några skötsel- eller rengöringsarbeten görs.

VÄROITUKSIA

FIN
Koneen valmistajan ja/tai enkooderijärjestelmän asentajan vastuulla on varmistaa, että turvallisuuden suojausta vaativissa RG2- ja RG4-sovelluksissa minkäkin muotoinen lukupääsäätäminen poikkeavuuksista vastaanottavan elektronisen järjestelmän rajoista – riippumatta siitä, kuinka se on aiheutunut – ei tee konetta turvallisuutta vaarantavaksi.
Koneen toimittajan vastuulla on varmistaa, että käyttäjä on tietoinen kaikista koneensa käytön liityvistä vääristä mukaan lukien Renishaw-työntekijöiden mainitsemat vaarat ja varmistaa, että on toimitettu asianmukaiset suojuksset ja turvalukitukset.
Katkaise virta ennen minkäänlaisten huolto- tai puhdistustoimien suorittamista.

ΠΡΟΕΙΔΟΠΟΙΗΣΕΙΣ

GR

O κατασκευαστής των μηχανήματος και/ ή ο υπεύθυνος εγκατάστασης του συστήματος κωδικοποίησης οφείλουν να διασφαλίσουν ότι, κατά τις επιφανείες εφαρμογές των συστημάτων RG2 και RG4, οικονόμησης μορφή απόδλησης του στημάτος κεραμικής δύνηται από τα όρια των ηλεκτρονικού δέκτη, που δημιουργήθηκε κατόπιν οποιαδήποτε αιτίας, δεν θέλεται σε κινδύνο την ασφάλεια του μηχανήματος.

Ο προμηθευτής των μηχανήματος οφείλει να δισταγόλισε ότι ο χρήστης είναι ενήμερος για τους κινδύνους που συνέβουν με τη χρήση των μηχανήματος των, συμπεριλαμβανομένων και διανομέων στην Ελλάδα προϊόντων της Renishaw. Επίσης οφείλει να δισταγόλισε ότι πάραχον οι κατάλληλες ασφάλειες και δικλείδες ασφαλείας.
Κλείστε το διακόπτη τον ρεύματος προτού ξεκινήσετε οποιαδήποτε λειτουργίες συντήρησης ή καθαρισμού.

DO NOT store readheads in conditions of high humidity as this may cause condensation to form on the readhead optics.

DO NOT touch connector pins or cable connectors unless suitable anti-static measures have been taken.

DO NOT connect or disconnect the readhead with the power on.

DO NOT touch the readhead optics with bare hands.

DO ensure protection is provided for both scale and readhead when transporting a machine with that equipment already installed.

DO refer to the Scale installation guide (part number M-9517-2855) for information on correct storage, handling and cleaning of scale.

Maintenance and cleaning



WARNING: Remove power before performing any maintenance operations.

DO use Renishaw RGW-1 alcohol wetted scale wipes to clean the readhead optics and the scale, available from your Renishaw representative.

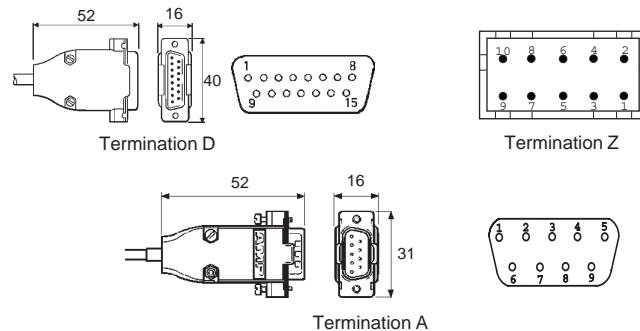
Or DO use a clean dry lint-free cloth.

Or DO use only the following solvents sparingly with a wetted lint-free cloth:

- Propan-2-ol (iso-propyl alcohol) $\text{CH}_3\text{CHOHCH}_3$
- n-Heptane $\text{CH}_3(\text{CH}_2)_5\text{CH}_3$

DO NOT use the following aggressive solvents to clean the scale:

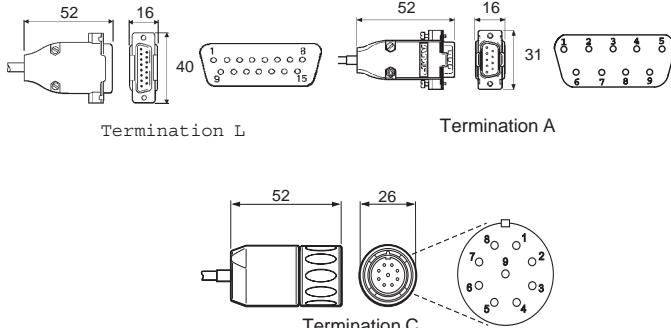
- Acetone CH_3COCH_3
- Chlorinated solvents
- Benzene
- Methylated spirits



Function	Signal	Colour (F)	9 pin 'D' type (A)	JST (Z)	15 pin 'D' type (D)
Power	5V	Brown	5	9	7, 8
	0V	White	1	10	2, 9
Incremental signals	A +	Green	2	8	14
	A -	Yellow	6	7	6
	B +	Blue	4	2	13
	B -	Red	8	1	5
Reference mark/Limit switch	Z+/Q-	Pink	3	5	12
	Z-/Q+	Grey	7	6	4
Shield	Inner	Inner shield	9	N/A	15
	Outer	Outer shield	Case	N/A	Case
LED repeater	Green	N/A	N/A	3	N/A
	Red	N/A	N/A	4	N/A

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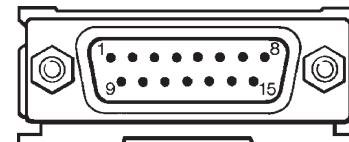
Connection diagram RGH24 analogue output types B and C



Function	Signal	Colour (F)	9 pin 'D' type (A) ("B" and "C" outputs)	15 pin 'D' type (L) ("B" outputs only)	9 pin circular (C) ("C" outputs only)
Power	5V	Brown	5	4, 5	6
	0V	White	1	12, 13	5
Incremental signals	V_i+ / I_i+	Green	2	9	8
	V_i- / I_i-	Yellow	6	1	7
	V_z+ / I_z+	Blue	4	10	4
	V_z- / I_z-	Red	8	2	3
Reference mark/Limit switch	V_o+ / I_o+	Pink	3	3	2
	V_o- / I_o-	Grey	7	11	1
Shield	Inner	Inner shield	9	15	9
	Outer	Outer shield	Case	Case	Case

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Connection diagram RGB25 (all models)



Function	Signal	Digital outputs	Analogue outputs
Power	5V	7	4
	5V	8	5
	0V	2	12
	0V	9	13
Alarm	E+	11	N/A
	E-	3	N/A
External set-up	X/Vx	1	7
Shield	Inner	15	15
	Outer	Case	Case
Incremental signals	Digital signal	"B" signal	"C" signal
	A+	V _i +	I _i +
	A-	V _i -	I _i -
	B+	V _z +	I _z +
	B-	V _z -	I _z -
	Z+/Q+	V _o +/Vq+	I _o +/Iq+
Reference mark/Limit switch	Z-/Q-	V _o -/Vq-	I _o -/Iq-
	Z+/Q+	V _o +/Vq+	I _o +/Iq+
Reference mark/Limit switch	Z-/Q-	V _o -/Vq-	I _o -/Iq-
	Z+/Q+	V _o +/Vq+	I _o +/Iq+

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CAUTION: Voltage spikes on the power supply line can result in permanent damage to the readhead. Please ensure that the power supply output is regulated to prevent this.

Power supply

RGH24 5V \pm 5%, 120mA (typical)
 150mA (RGH24Y and RGH24W)

RGB25 5V \pm 5%, 120mA (typical)
 300mA (RGB25Y re-timed)
 340mA (RGB25H re-timed)

Temperature Storage: -20°C to +70°C
 Operating: 0°C to +55°C

Humidity 10 - 90% RH non-condensing

Sealing IP40

Acceleration operating 300m/s²

Shock non-operating 1000m/s², 11ms, 1/2 sine

Vibration operating 100m/s², 55 to 2000Hz per IEC 68-2-6

Weight Readhead: 11g (9g RGH25)

Cable: 34g/m

RGH25 Interface: 95g

RGB25H Interface: 120g

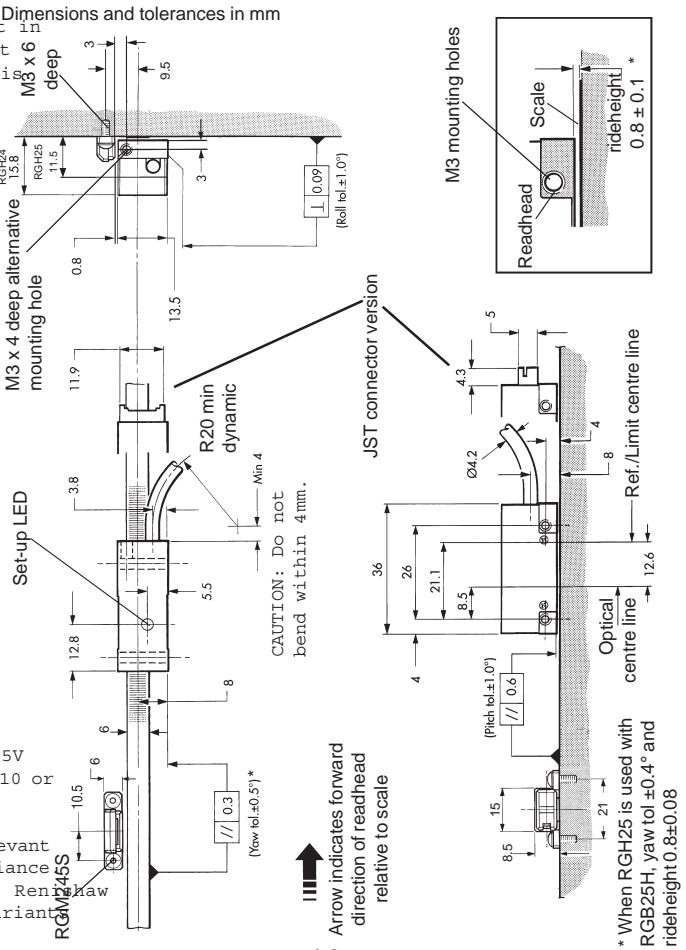
EMC compliance BS EN 50081-2, BS EN 50082-2,
BS EN 55011 (cable versions only)

Cable integral double shielded, outside dia. 4.2mm.
Flex life >20x10⁶ cycles at 20mm
bend radius. 1.5m standard length
on RGH25, various lengths available
for RGH24.

IMPORTANT: Power to Renishaw readhead units must be supplied from a 5V DC SELV supply complying with the essential requirements of BS EN 61010 or similar specification.

The RGH24 JST connector series readheads have been designed to the relevant EMC standards, but must be correctly integrated to achieve EMC compliance. In particular, attention to shielding arrangements is critical. Renishaw recommends the use of a double screened cable as used in the cable variant of the RGH24.

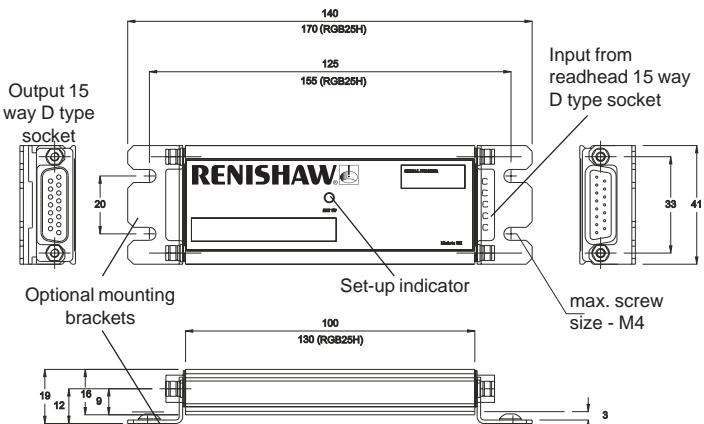
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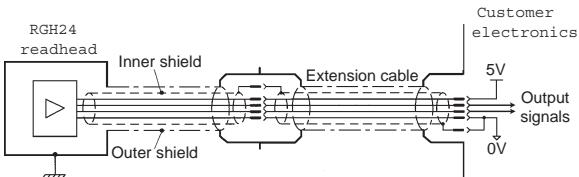
Installation drawing - RGB25 interface

General outline and dimensions. Dimensions and tolerances in mm

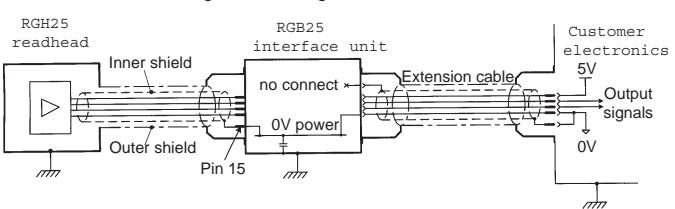


Electrical connections

RGH24 Grounding and shielding



RGH25 & RGB25 Grounding and shielding



Installation 1

Mounting brackets

The bracket must have a flat mounting surface, ensure conformance to the installation tolerances, allow adjustment to the rideheight of the readhead, and be sufficiently stiff to prevent deflection of the readhead during operation.

For easier installation, initial adjustment of the roll and yaw of the bracket with respect to the axis of readhead travel should be made before the RGH24 or RGH25 is attached. This can be done with a clock gauge and a precision square.

Readhead mounting

When mounting the readhead, ensure that the scale, readhead optical window and mounting face are clean and free from obstructions.

NOTE: Refer to Maintenance and cleaning section of this manual for cleaning instructions.

To set up the rideheight of the readhead, a blue shim is provided. The shim should be inserted between the readhead and scale whilst the readhead is being connected to the bracket.

Adjusting set-up

Step No.	Set-up parameter	Diagnostic and adjustments
1		Set rideheight to 0.8 Adjustment required
2		Adjust Yaw ()
3		Re-adjust rideheight
4		Optimum set-up achieved
		Red, Orange, Green
		V, or X 0V 5V

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Once the readhead is connected to the bracket, the rideheight, pitch, yaw and roll of the unit may need to be adjusted to ensure that optimum signal strength is achieved. It should be noted that the readhead must be properly connected to the power supply (see relevant connection diagram on this sheet for the model you are using) to enable the set-up LED or external set-up signal to be used. See also the diagram "Adjusting set-up".

Confirming set-up

For reliable operation, the set-up LED should be GREEN (RGB25 external set-up signal at 5V) when moved slowly along the full axis travel.

Set-up LED

RGH24 readheads and RGB25 interfaces are supplied as standard with a patented set-up LED to simplify the installation procedure and ensure optimum signal output.

NOTE: Neither the set-up LED nor the external set-up signals will indicate an optimised set-up over the reference mark. For further details, refer also to the section in this guide headed Installation 3 - reference mark set-up .

The set-up LED will exhibit one of three colours during normal use;

GREEN - optimum set-up.

ORANGE - acceptable, but below the recommended level.

RED - signal may be too low for reliable operation, adjust set-up.

An external set-up signal (X or V_x) is also available on RGB25 interfaces for use where the LED is not visible. In this case, 5V indicates optimum set-up, while a 0V signal indicates that the set-up should be adjusted. The JST version of the RGH24 has an LED repeater signal that can be used in cases where the LED is not visible.

IMPORTANT: The RGH24 range does not incorporate a separate Alarm signal. Low signal output is indicated by a 3-state arrangement. For further details of the threshold limits where 3-state is activated, please refer to the datasheet. Your local Renishaw representative can also provide you with additional information on how to detect the 3-state alarm.

Note: Check that the reference mark sensing option has been specified RGH24 or RGH25 that you have purchased.

1) For registration condition to be shown, the LED must already be showing GREEN.

When the sensor in the readhead passes the magnetic reference mark actuator, a pulse is output.

The actuator trigger signal needs to be optimally phased relative to the incremental signal for the intended direction of travel only so that the same pulse is always output. The process of achieving this is 'registration' and is indicated by the interface LED.

Procedure (refer to diagram Installation 4)

1) Run the readhead past the actuator in the desired direction whilst observing the LED for either a RED flash (optimum registration), or an ORANGE flash (acceptable but further adjustment is recommended). If LED blanks out, full adjustment is required.

2) Adjust the actuator as necessary by turning the adjuster screw in an anti-clockwise direction. Only a very small adjustment is needed - try 1/4 turn steps.

3) Repeat steps 1 and 2 until registration is achieved - i.e. the LED flashes RED.

Note:

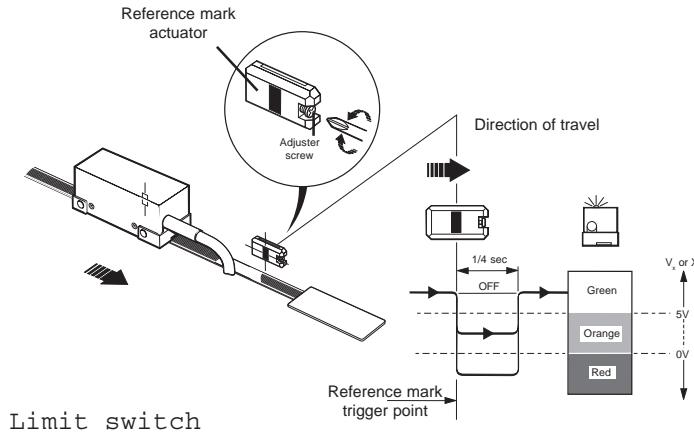
1) If the readhead mounting is disturbed at any time, the reference mark will have to be re-registered.

2) A reference pulse is output in both directions, but because the reference mark can only be phased for one direction of traverse, any indication from the LED when the readhead is moved in the reverse direction is to be ignored.

3) LED flash duration is a constant 1/4 second, regardless of trav-

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Installation 4 - reference mark set-up (continued)



Limit switch

CAUTION: The limit switch feature must never be used as a fail-safe stop device.

Note: Check that the limit switch sensing option has been specified on the RGH24 or RGH25 that you have purchased.

A pulse is output from the readhead for the duration of the crossing of the magnetic actuator.

The limit switch provides an end of travel home position point repeatable to <0.1mm (typical).

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Renishaw plc New Mills, Wotton-under-Edge, Gloucestershire GL12 8JR, UK

Tel +44 (0)1453 524524 Fax +44 (0)1453 524901
[07000 RENISHAW] Telex 437120 RENMET G
email uk@renishaw.com

Renishaw Inc., USA
Tel +1 847 286 9953
Fax +1 847 286 9974

email usa@renishaw.com

Renishaw K.K., Japan
Tel +81 3 5332 6021
Fax +81 3 5332 6025

email japan@renishaw.com

Renishaw GmbH, Germany
Tel +49 7127 9810
Fax +49 7127 88237

email germany@renishaw.com

Renishaw S.A., France
Tel +33 1 64 61 84 84
Fax +33 1 64 61 65 26

email france@renishaw.com

Renishaw S.p.A., Italy
Tel +39 011 9 66 10 52
Fax +39 011 9 66 40 83

email italy@renishaw.com

Renishaw Iberica S.A., Spain
Tel +34 93 478 21 31
Fax +34 93 478 16 08

email spain@renishaw.com

Renishaw A.G., Switzerland
Tel +41 55 410 66 66
Fax +41 55 410 66 69

email switzerland@renishaw.com

Renishaw Latino Americana Ltda., Brazil
Tel +55 11 4195 2866
Fax +55 11 4195 1641

email brazil@renishaw.com

Renishaw (Hong Kong) Ltd., Hong Kong,
The Peoples Republic of China
Tel +852 2753 0638
Fax +852 2756 8786

email hongkong@renishaw.com

Renishaw Metrology Systems Private Limited,
India
Tel +91 80 5320 144
Fax +91 80 5320 140

email india@renishaw.com

Renishaw Oceania Pty Ltd., Australia
Tel +61 3 9553 8267
Fax +61 3 9592 6738

email australia@renishaw.com

Renishaw's Representative Offices

Indonesia Tel +62 21 428 70153
Fax +62 21 424 3934
email indonesia@renishaw.com

Singapore Tel +65 897 5466
Fax +65 897 5467
email singapore@renishaw.com

Taiwan Tel +886 4 2513665
Fax +886 4 2513621
email taiwan@renishaw.com

The People's Republic of China
Tel +86 10 641 07993
Fax +86 10 641 07992

China Tel +86 10 641 07993
Fax +86 10 641 07992
email china@renishaw.com

Renishaw's Liaison Office

South Korea Tel +82 2 565 6878
Seoul Fax +82 2 565 6879
email southkorea@renishaw.com