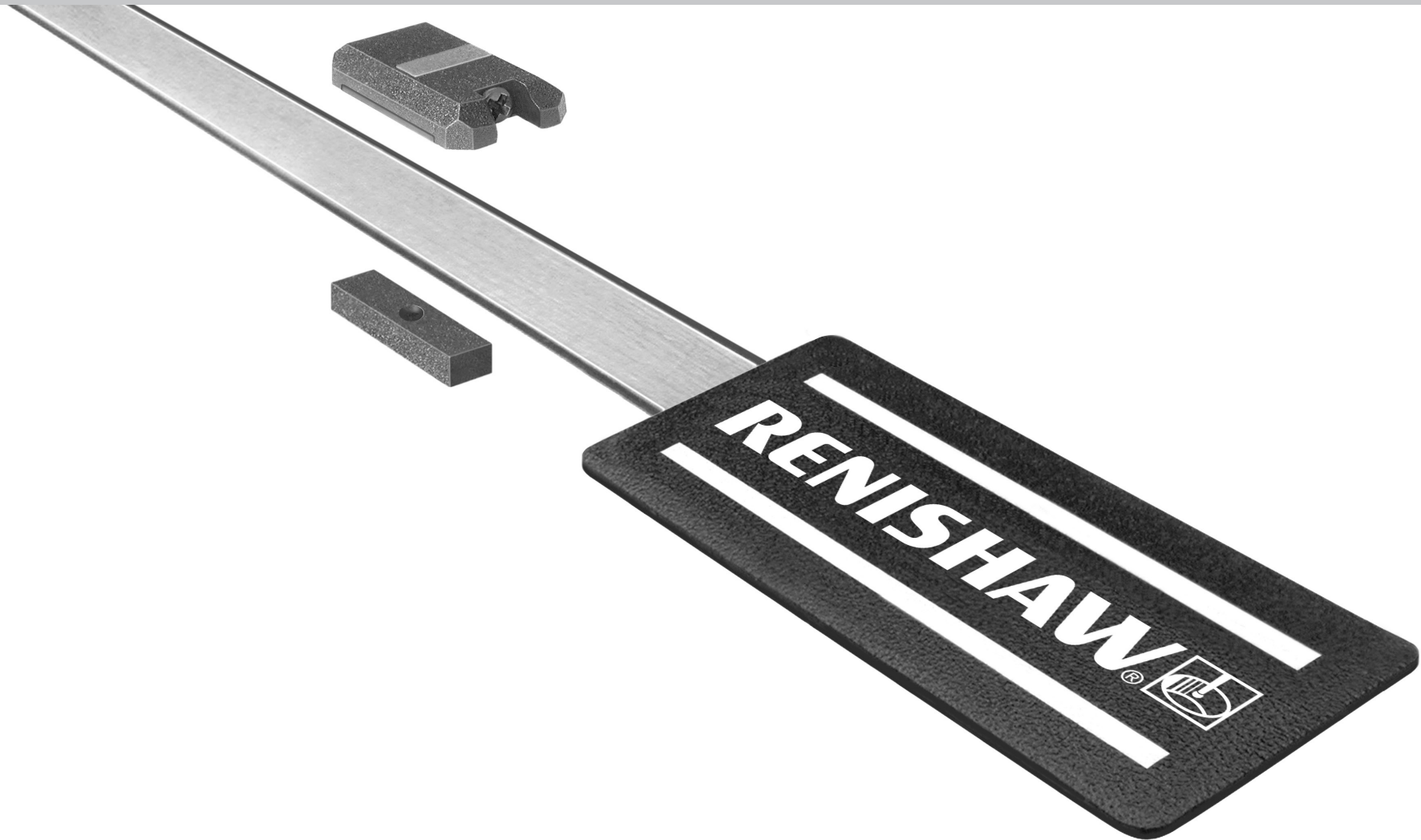


RGS20-S, RGS20-PC, RGS40-S, RGS40-PC scale





Renishaw plc declares that the RG2 and RG4 encoder systems comply with the applicable standards and regulations. A copy of the EC Declaration of Conformity is available on request.

EMC compliance

The RG2 and RG4 encoder systems conform to the relevant harmonised European standards for electromagnetic compatibility as detailed below.

BS EN 61326-1: 2006

FCC compliance

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, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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.

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 the user will be required to correct the interference at his own expense.

NOTE: This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance.

RoHS compliance

Compliant with EC directive 2002/95/EC (RoHS)

LED classification

Class 1M LED product. LED radiation. Do not view directly with optical instruments.

Patents

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

US 4926566 EP 0388453 US 5,063,685 JP 2837483 EP 1147377 US 6,588,333 B1

Further information

For further information relating to the installation of scale and readheads, see also the relevant readhead data sheets and installation guides. These can be downloaded from our website www.renishaw.com/encoder and are also available from your local representative.

	Data Sheet	Installation Guide
RGH22	L-9517-0182	M-9531-2050
RGH24	L-9517-0166	M-9541-0084
RGH25F	L-9517-9113	M-9562-0001
RGH26	L-9517-9106	M-9531-2082
RGH34	L-9517-0185	M-9537-0194
RGH41	L-9517-0186	M-9537-0196

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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.

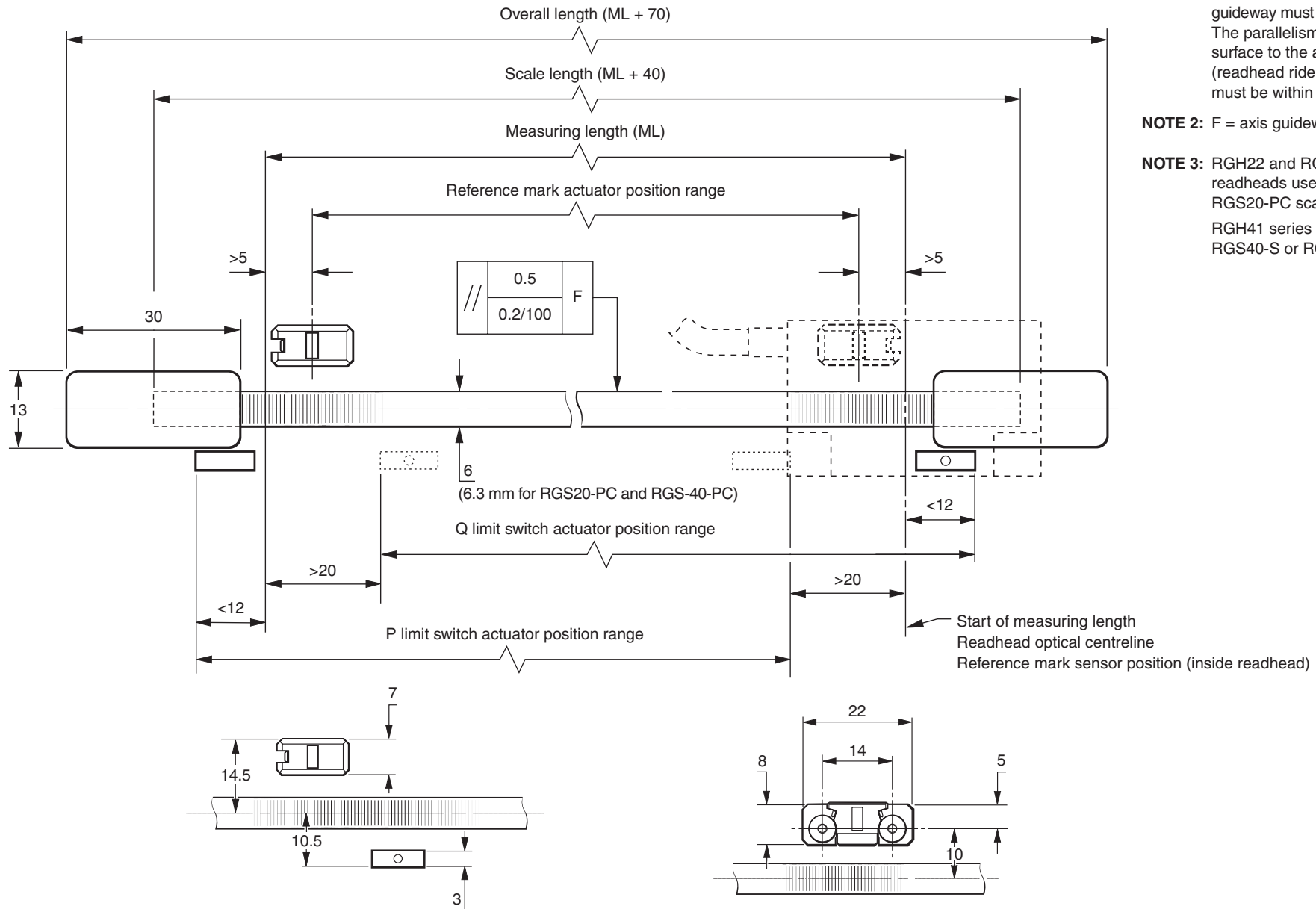
Storage and handling	Maintenance and cleaning	
<p>DO ensure that protection is provided for both scale and readhead when transporting a machine with that equipment already installed.</p> <p>DO store scale in a cool dry place out of direct sunlight and in it's original packaging prior to installation. When stored on a reel ensure that the backing tape is facing out.</p> <p>DO allow scale to acclimatize to installation environment prior to installation.</p> <p>DO store at <95% RH</p> <p>DO operate at <80% RH</p> <p>DO store between -20 °C and +70 °C</p> <p>DO operate between 0 °C and +70 °C</p>	<p>DO use Renishaw (A-9523-4040) alcohol wetted scale wipes to clean the readhead optics and scale, available from your Renishaw representative.</p> <p>Or - use a clean, dry, lint-free cloth.</p> <p>Or - use only the following solvents sparingly with a wetted lint-free cloth:</p> <ul style="list-style-type: none"> - Propan-2-ol (iso-propyl alcohol) CH₃CHOHCH₃ - n-Heptane CH₃(CH₂)₅CH₃ 	<p>DO NOT use the following aggressive solvents to clean the scale:</p> <ul style="list-style-type: none"> - Acetone CH₃COCH₃ - Chlorinated solvents - Methylated spirits

Technical specifications

	RGS20-S	RGS20-PC	RGS40-S	RGS40-PC
Scale type	Reflective gold plated steel tape with protective lacquer coating and self adhesive backing	Reflective gold plated steel tape with polyester coating for improved chemical resistance and self adhesive backing	Reflective gold plated steel tape with protective lacquer coating and self adhesive backing	Reflective gold plated steel tape with polyester coating for improved chemical resistance and self adhesive backing
Scale pitch	20 µm	20 µm	40 µm	40 µm
Linearity	± 3 µm/m ± 0.75 µm/60 mm	± 5 µm/m ± 1.5 µm/60 mm	± 3 µm/m ± 1 µm/60 mm	± 5 µm/m ± 1.5 µm/60 mm
Scale length	100 mm to 50 m >50m by special order	1 m to 50 m	100 mm to 50 m >50m by special order	1 m to 50 m
Compatible readheads	RGH22, RGH24, RGH25, RGH26	RGH22, RGH24, RGH25, RGH260	RGH34, RGH41	RGH41
Scale thickness	0.2 mm	0.3 mm	0.2 mm	0.3 mm

Scale installation diagram for RGH22, RGH26 and RGH41 series readheads

Dimensions and tolerances in mm (not to scale)



NOTE 1: The surface roughness of the axis guideway must be $\leq 3.2 \mu\text{m}$. The parallelism of the scale surface to the axis guideway (readhead ride height variation) must be within 0.05 mm.

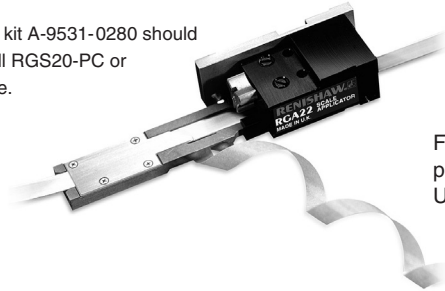
NOTE 2: F = axis guideway

NOTE 3: RGH22 and RGH26 series readheads use RGS20-S or RGS20-PC scale. RGH41 series readheads use RGS40-S or RGS40-PC scale.

RGA22 - scale applicator

The RGA22 scale applicator kit (A-9531-0265*) is designed specifically for use with the RGH22, RGH26 and RGH41.

*Scale applicator kit A-9531-0280 should be used to install RGS20-PC or RGS40-PC scale.



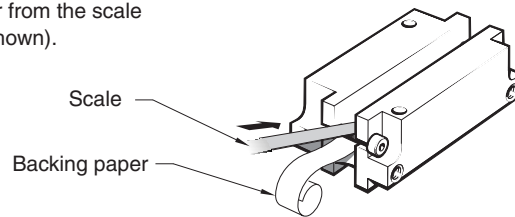
For details of use of the RGA22 please refer to 'RGA22 scale applicator User's guide' (M-9531-0297)

RGA22G - scale applicator

The RGA22G (A-9531-0239) scale applicator is designed specifically for use with the RGH22, RGH26 and RGH41 readheads and RGS20-S and RGS40-S scale.

Refer to RGA22 installation instruction sheet M-9531-1281.

1. Mark out 'START' and 'FINISH' points for the scale on the axis - ensure that there is room for the end clamps (see 'Installation drawing').
2. Begin to remove the backing paper from the scale and insert into the applicator (as shown).



There are mounting holes located on both sides.

It is possible to lay the scale in either direction, with readhead mounted from either face:



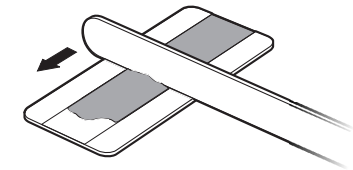
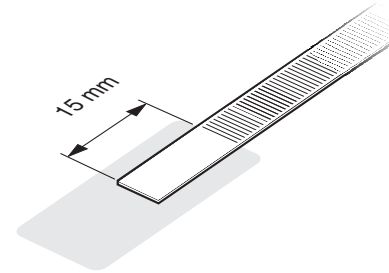
3. Ensure that the end of the scale is in line with the 'START' position on the axis and slowly and smoothly take the applicator through its full axial run, ensuring that the backing paper is pulled manually from the scale.
4. Ensure complete adhesion of the scale to the substrate by applying firm finger pressure along the length of the scale from the centre outwards towards each end.
5. Fit end clamps (see 'End clamps' section).

End clamps

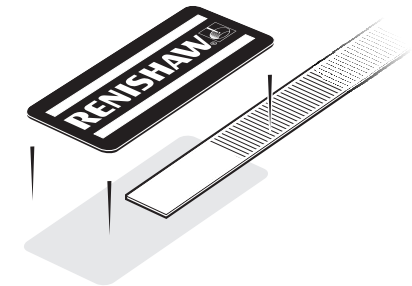
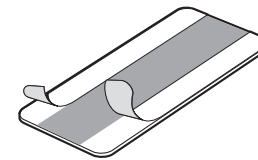
A-9523-4015 is an end clamp kit designed to be used with Renishaw scale (see 'Scale types' section)

Note: End clamps can be mounted before or after readhead installation.

1. Remove the lacquer or polyester coating from the last 15 mm of each end of the scale with a knife and clean with one of the recommended solvents (see 'Handling and cleaning').
2. Mix up a sachet of glue (A-9531-0342) and apply a small amount to the underside of the end clamp.



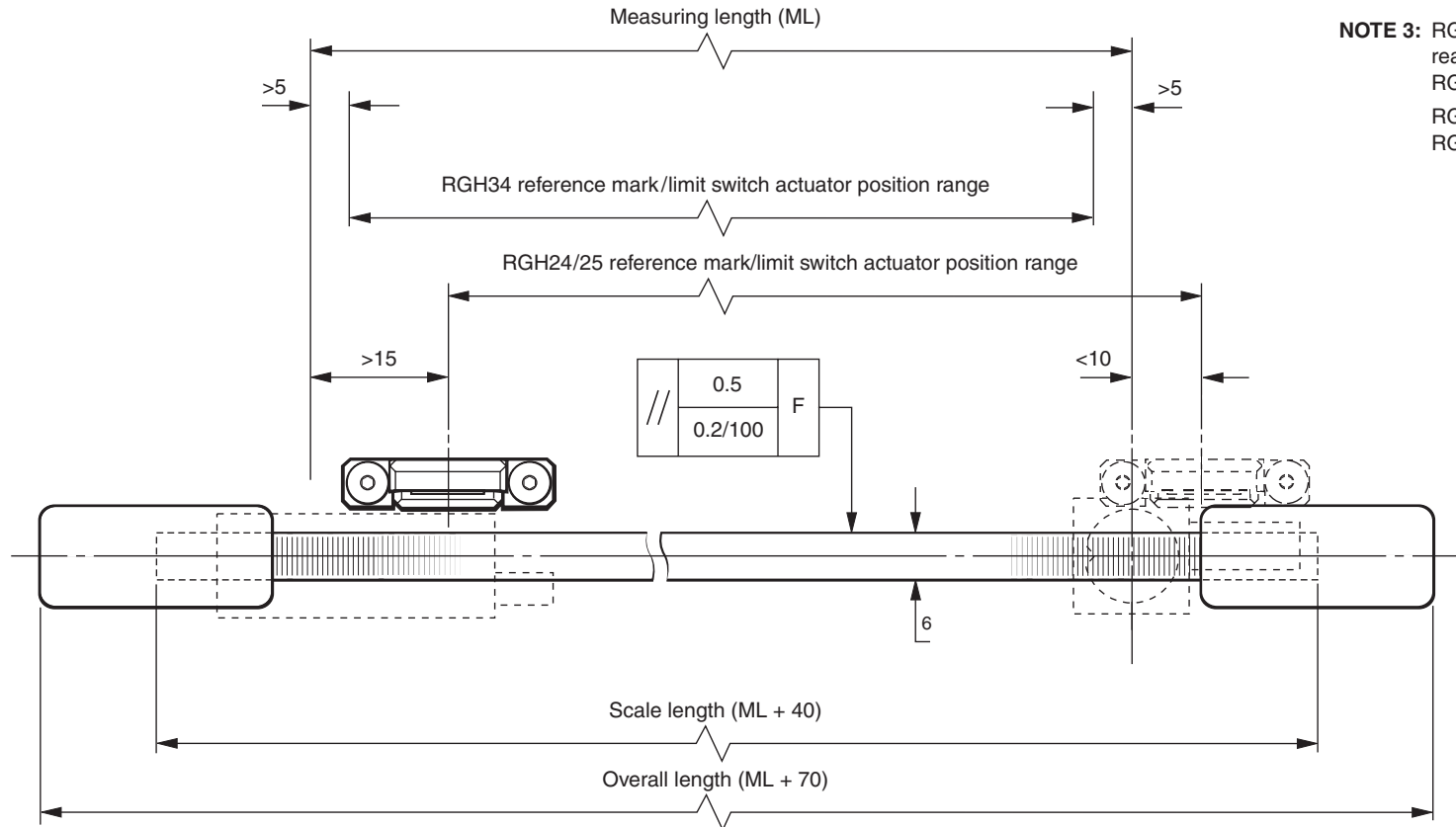
3. The end clamp features a small region of contact adhesive. This will temporarily hold the end clamp in position while the glue cures. Remove the backing tape from either side.
4. Immediately position end clamp over the end of the scale. Allow 24 hours at 20 °C for full cure.



Ensure that excess glue is wiped away from scale as it may affect the readhead signal level.

Scale installation diagram for RGH24, RGH25 and RGH34 series readheads

Dimensions and tolerances in mm (not to scale)



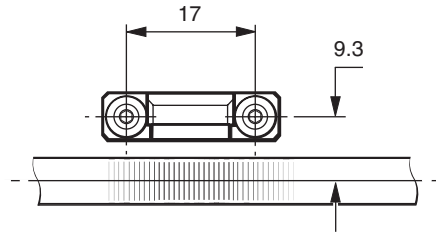
NOTE 1: The surface roughness of the axis guideway must be $\leq 3.2 \mu\text{m}$.
The parallelism of the scale surface to the axis guideway (readhead ride height variation) must be within 0.05 mm.

NOTE 2: F = axis guideway

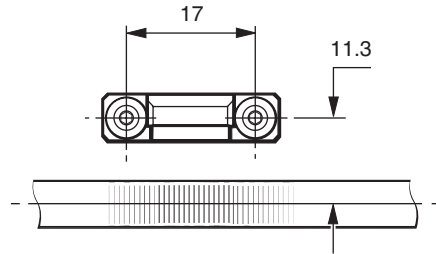
NOTE 3: RGH24 and RGH25 series readheads use RGS20-S or RGS20-PC scale.
RGH34 series readheads use RGS40-S scale.

Limit switches

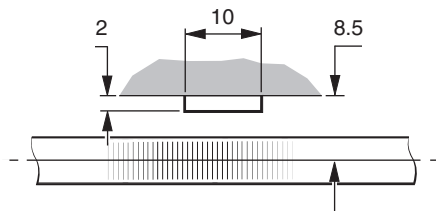
A-9541-0040 with RGH24/25



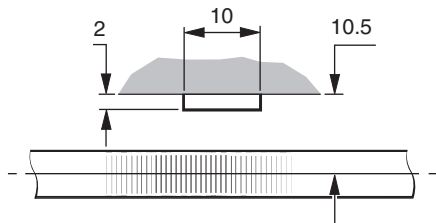
A-9541-0040 with RGH34



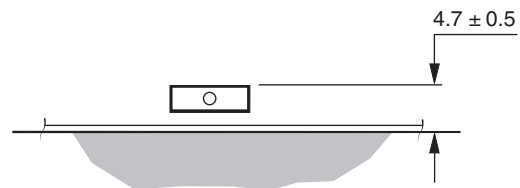
A-9531-0251 with RGH24/25



A-9531-0251 with RGH34

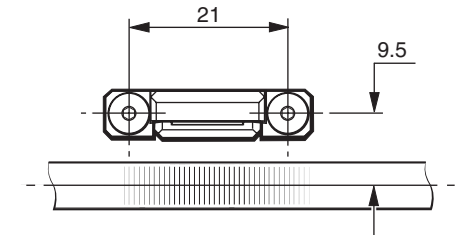


A-9531-0251 with RGH24/25/34

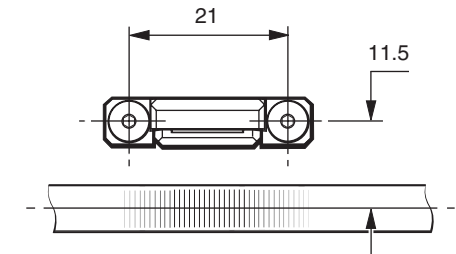


Reference marks

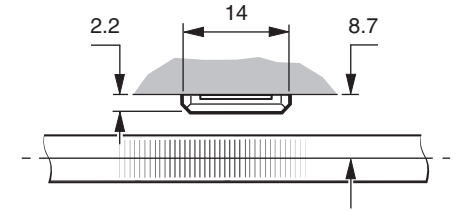
A-9541-0037 with RGH24/25



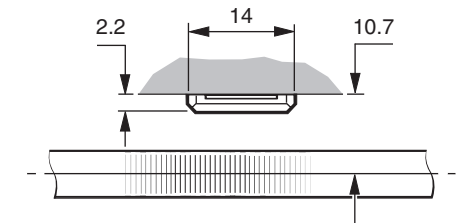
A-9541-0037 with RGH34



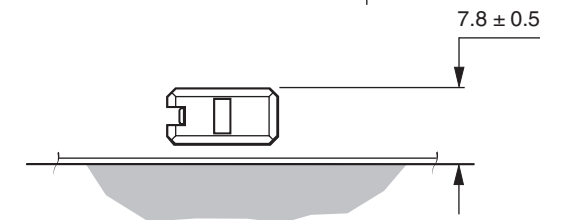
A-9531-0250 with RGH24/25



A-9531-0250 with RGH34



A-9531-0250 with RGH24/25/34

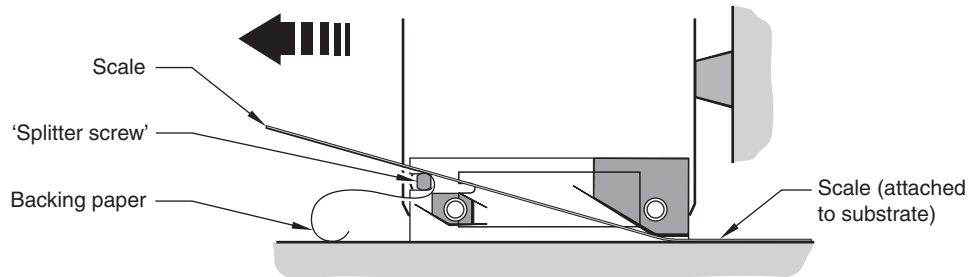
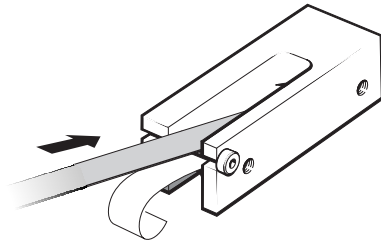


RGA245 scale applicator

The RGA245 (A-9541-0124) is an applicator designed specifically for use with the RGH24 and RGH25 readheads and RGS20-S scale.

Refer to RGA245 installation instruction sheet M-9541-0035.

1. Mark out 'START' and 'FINISH' points for the scale on the axis - ensure that there is room for the end clamps (see 'RGH24/25 installation drawing').
2. Begin to remove the backing paper from the scale and insert into the applicator (as shown).

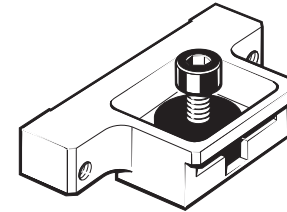


3. Ensure that the end of the scale is in line with the 'START' position on the axis and slowly and smoothly take the applicator through its full axial run, ensuring that the backing paper is pulled manually from the scale.
4. Ensure complete adhesion of the scale to the substrate by applying firm finger pressure along the length of the scale from the centre outwards towards each end.
5. Fit end clamps (see 'End clamps' section).

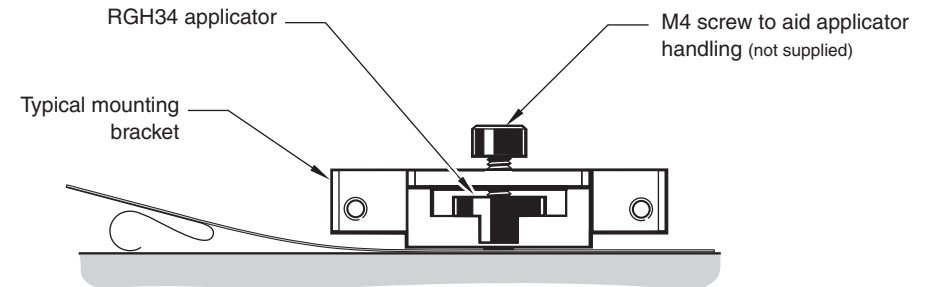
RGH34 scale applicator

The RGH34 scale applicator kit (A-9537-0197) is for use with the RGH34 only

The RGH34 scale applicator is designed for use with a 'typical' RGH34 mounting bracket, for example:



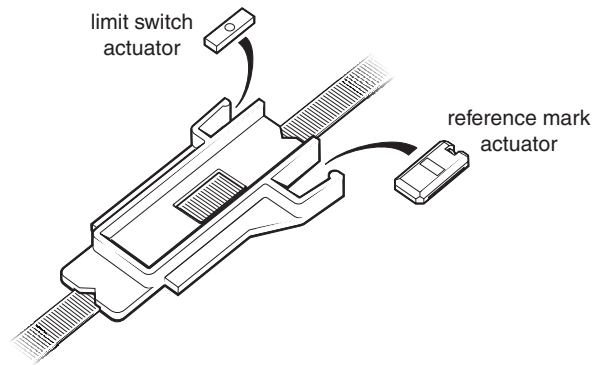
1. Before applying the Renishaw scale, always ensure the substrate is clean.
2. Mark out 'START' and 'FINISH' points for the scale on the axis - ensure that there is room for the end clamps (see 'RGH34 installation drawing').
3. Locate applicator into mounting bracket, ensuring scale guides on underside of body run parallel to axis of motion.
4. Begin to remove the backing paper from the scale and insert into the applicator (as shown). Ensure that the scale runs between the the two guides on the bottom of the applicator.



5. Ensure that the end of the scale is in line with the 'START' position on the axis and slowly and smoothly take the applicator through its full axial run, ensuring that the backing paper is pulled manually from the scale.
6. Ensure complete adhesion of the scale to the substrate by applying firm finger pressure along the length of the scale from the centre outwards towards each end.
7. Fit end clamps (see 'End clamps' section).

Reference mark and limit switch actuator installation

An orange shim is provided to locate reference marks and limit switches on systems using RGH22, RGH26 and RGH41 readheads.



Reference mark and limit switch actuators can be mounted independently from each other, but within the limits specified by the relevant installation drawing.



Ensure that the glue does not enter the reference mark actuator adjustment mechanism.

Once the reference mark has been secured it must be phased with the readhead. Refer to your readhead 'Installation guide' for further information.

Refer to the relevant readhead installation drawing for details of the sensor positions.

Reference mark actuator types

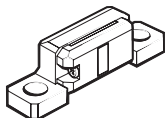
Reference marks provide a repeatable 'datum position' for the readhead. Actuators are available in either bolted or glued formats (see below).



A-9531-0250
Epoxy-mounted reference mark actuator for use with RGH22, RGH26 and RGH41



A-9531-0287
Screw-mounted reference mark actuator for use with RGH22, RGH26 and RGH41

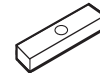


A-9541-0037
Screw-mounted 90° reference mark actuator for use with RGH24, RGH25 and RGH34

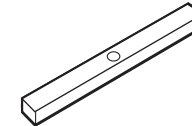
Limit switch actuator types

Limit switch detection is entirely independent of other readhead functions - the signal is only output when the readhead is positioned over the limit switch actuator.

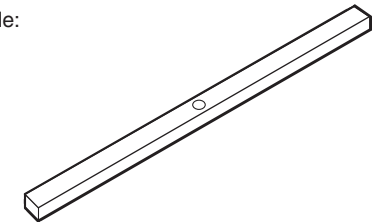
There are several different size limit switch actuators available:



A-9531-0251
10 mm limit switch actuator for RGH22, RGH26 and RGH41



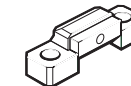
A-9531-2052
24.4 mm limit switch actuator for RGH22, RGH26 and RGH41



A-9531-2054
50 mm limit switch actuator for RGH22, RGH26 and RGH41



A-9531-0285
Flush-mounted 6.4 mm diameter x 2.0 mm thick limit switch actuator for RGH22, RGH26 and RGH41



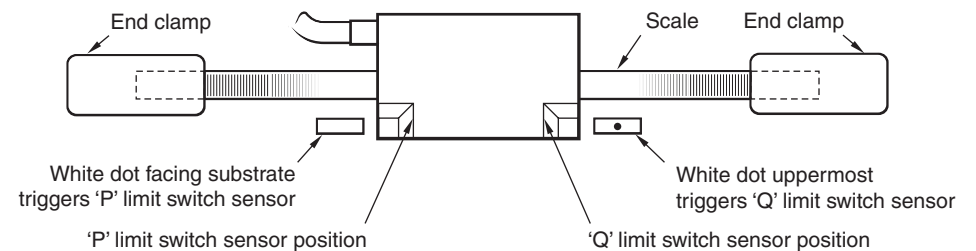
A-9541-0040
10 mm 90° limit switch actuator for RGH24, RGH25 and RGH34

Single limit switches

For single limit switch detection, limit switch actuator should be mounted with the white dot uppermost. Refer to 'Reference mark and limit switch actuator installation'.

Dual limit switches (option on RGH22, RGH26 and RGH41 only)

Some versions of the RGH22, RGH26 and RGH41 are configured to detect dual limit switch actuators. Refer to 'Reference mark and limit switch actuator installation' and the diagram below.



If in doubt, refer to your readhead Installation guide to see if single or dual limit switch capability has been specified on the readhead you have purchased.

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