

RGH25F high resolution encoder system



Renishaw's RGH25F offers all the benefits of the market leading RG2 non-contact linear encoder systems; patented filtering optical scheme, high contamination tolerance and high speed.

The RGH25F has been designed for use with Renishaw's RGS20-S gold-plated scale in precision applications requiring fine resolutions, high accuracy, compact size and low mass.

The readhead is enclosed in an RFI screened housing and uses proven solid state components to give outstanding reliability.

The RGF interfaces can be mounted remotely to interpolate the signals produced by the readhead.

The interfaces incorporate automatic gain control and unique self-tuning adaptive electronics which, combined with the filtering optics, ensure excellent signal integrity, and give a low cyclic error.

Common applications include optical fibre alignment, semiconductor manufacturing, inspection, precision stages and other systems requiring high resolution where space is at a premium.

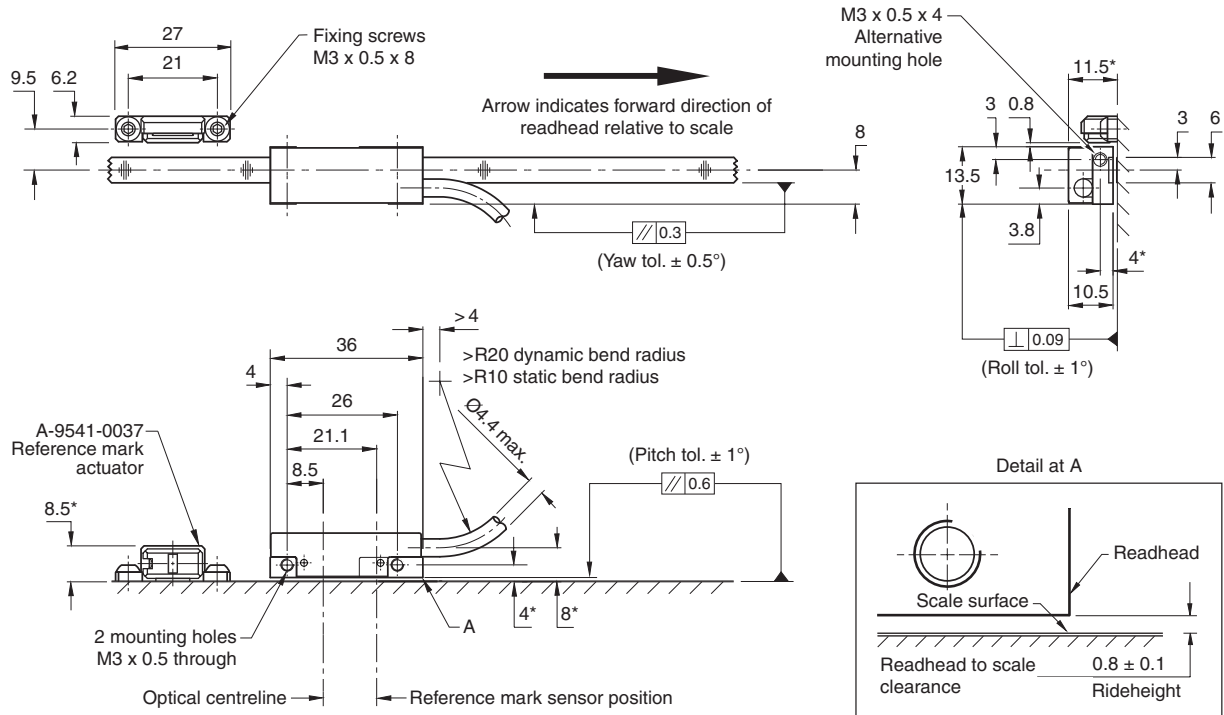
Readhead RGH25F - common readhead

Interfaces RGF0100 - 200 nm resolution
RGF0200 - 100 nm resolution
RGF0400 - 50 nm resolution
RGF1000 - 20 nm resolution
RGF2000 - 10 nm resolution

- Non-contact open optical system
- Resolutions of 10 nm, 20 nm, 50 nm, 100 nm and 200 nm
- Low cyclic error
- Self-tuning adaptive electronics give reliability and high accuracy
- Uses low profile RGS20-S self-adhesive scale
- Low mass
- Integral set-up and diagnostic LEDs for quick set-up

RGH25F installation drawing

Dimensions and tolerances in mm



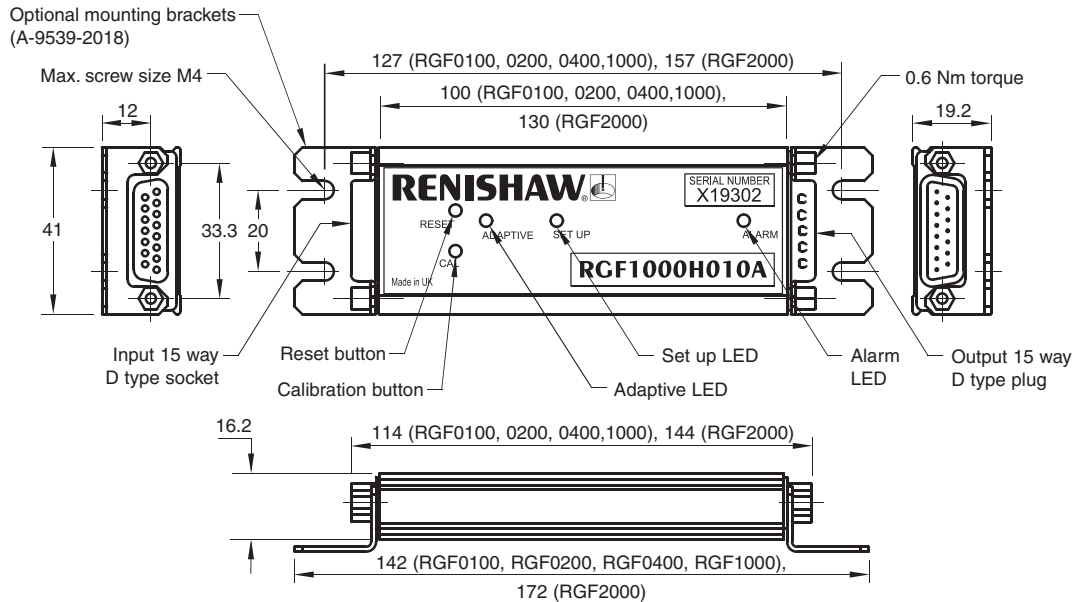
*Dimensions measured from substrate allowing for a 0.2 mm nominal scale thickness.

NOTE: When using RGF2000 rideheight, roll, pitch and yaw tolerances will be reduced by 20%.

Temperature (system)	Storage -20 °C +70 °C Operating 0 °C to +55 °C
Humidity (system)	Storage 95% maximum relative humidity (non-condensing) Operating 80% maximum relative humidity (non-condensing)
Sealing	Readhead IP40 Interface IP20
Acceleration (system)	Operating 500 m/s ² BS EN 60068-2-7:1993 (IEC 68-2-7:1983)
Shock (system) non-operating	1000 m/s ² , 6 ms, ½ sine BS EN 60068-2-27:1993 (IEC 68-2-27:1987)
Vibration (system) operating	100 m/s ² max @ 55 to 2000 Hz BS EN 60068-2-6:1996 (IEC 68-2-6:1995)
Mass	Readhead RGH25F: 9 g Interface RGF0100, RGF0200, RGF0400, RGF1000: 100 g RGF2000: 125 g Cable 34 g/m
EMC compliance (system)	BS EN 61326
Cable	Double-shielded, maximum outside diameter 4.4 mm Flex life $>20 \times 10^6$ cycles at 20 mm bend radius
Termination to RGF	15 way D type plug
Maximum cable lengths	5 m readhead/interface 20 m interface/controller

RGF installation drawing

Dimensions in mm

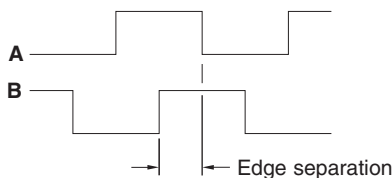


Operating and electrical specifications

Power supply	5 V ± 5%	RGF0100, RGF0200, RGF0400, RGF1000 typical 150 mA - worse case 210 mA RGF2000 typical 190 mA - worse case 260 mA Renishaw encoder systems must be powered from a 5 V dc supply complying with the requirements for SELV of standard EN (IEC) 60950.
	Ripple	200 mVpp @ frequency up to 500 kHz maximum

NOTE: Current consumption figures include RGH25F readhead, but refer to unterminated interfaces. A further 25 mA per channel pair (eg A+, A-) will be drawn when terminated with 120 Ω.

Edge separation



The RGF interfaces are available with a variety of different clocked outputs. These are designed to prevent fine edge separations being missed by receiving electronics utilising slower clock speeds.

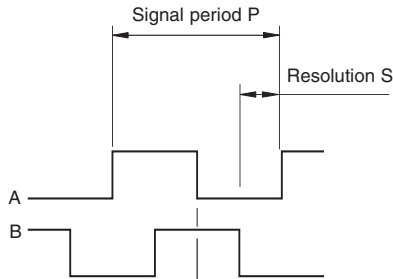
The table below shows the maximum speed and associated minimum recommended counter clock frequency for each option.

Option code	Recommended counter clock frequency (MHz)	RGF0100 Max. speed (mm/s)	RGF0200 Max. speed (mm/s)	RGF0400 Max. speed (mm/s)	RGF1000 Max. speed (mm/s)	RGF2000 Max. speed (mm/s)
250	25	1800	1500	750	300	150
125	12.5	1500	750	350	150	75
060	6	750	350	175	75	40
030	3	400	175	80	40	20
010	1	100	40	20	10	5

Output specifications

Form - Square wave differential line driver to EIA RS422A

Incremental - 2 channels A and B in quadrature (90° phase shifted)*



Model	P (nm)	S (nm)
RGF0100	800	200
RGF0200	400	100
RGF0400	200	50
RGF1000	80	20
RGF2000	40	10

Reference*

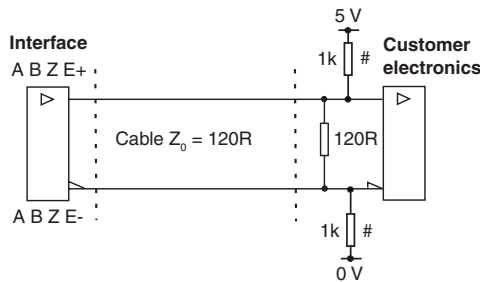


Reference pulse Z, duration as resolution S. Repeatability of position (uni-directional) maintained within $\pm 10^\circ\text{C}$ from installation temperature and for speed $< 250\text{ mm/s}$.

Re-synchronised at power-up with any one of the quadrature states (00, 01, 11, 10).

Actuation device A-9541-0037.

Recommended signal termination

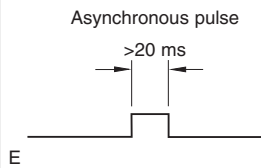


Only required on alarm channel E for fail safe operation.

Standard RS422A line receiver circuitry.

* **NOTE:** Inverse signals not shown for clarity.

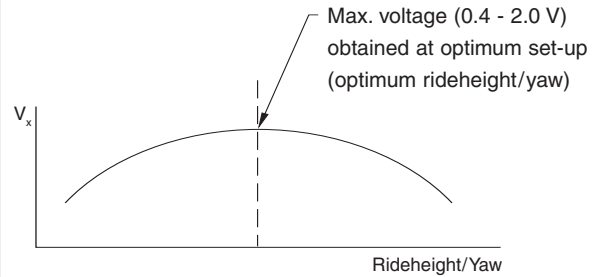
Alarm*



Alarm signal E is asserted when:

- signal is outside specified limits
- overspeed error occurs

Set-up



For worldwide contact details, please visit our
 main website at www.renishaw.com/contact

