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HS20 laser head

The Renishaw HS20 laser head in combination with an external linear optics kit, forms a non-contact interferometric based encoder system for long axis, high accuracy, linear position feedback applications.

The HS20 laser system is suitable for use in harsh machine shop environments with part per million (ppm or 1 µm/metre) accuracy being achievable for axis lengths of up to 60 m.†

Features of the HS20 laser head include:

- Stabilised Class II (<1 mW) HeNe laser source
- User selectable output resolution and update rate
- Industry standard AQuadB positional output
- 24 V system status lines
- Visual error reporting via two integral tri-colour LEDs

A single set of configuration (DIP) switches enables the HS20 to be configured to match the application. These allow selection of nominal output resolutions of 79, 158, 316 or 633 nm when used with a single pass retroreflector based interferometer configuration, and output update rates of 16, 8, 4, 2 and 1 MHz, ensuring count integrity.

A digital, serial comms output is available for direct signal strength monitoring.

To maintain accuracy over a range of environmental conditions, the HS20 should be used in combination with the RCU10 compensation system, which compensates for air refractive index changes due to variations in the ambient environment. The RCU10 can also be used to convert a laser wavelength related resolution to a more standard resolution. For example, in some long axis applications the RCU10 is used to convert a resolution of 633 nm to 1 µm.

General outline and dimensions

Dimensions in mm (inches)

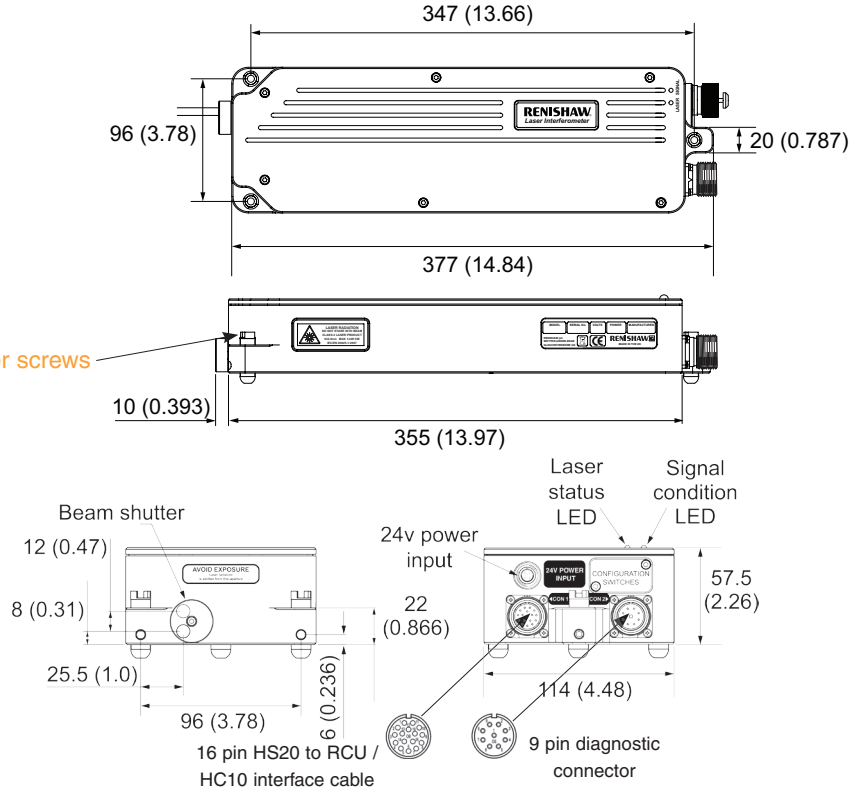
Overall dimensions:

Height:	57.5	(2.26)
Length:	387	(15.23)
Width:	114	(4.48)

Fixing:

3 off M12 x 1 mm x 33 mm adjuster screws

† When used together with RCU10 environmental compensator



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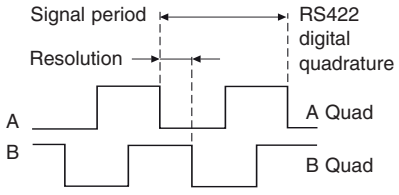
HS20 laser head performance

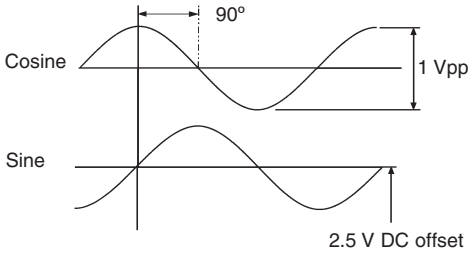
Laser type Wavelength	HeNe Class II 632.8 nm	Maximum output power from laser tube <1 mW
Laser beam diameter	6 mm	12 mm centre to centre (outward and return beams)
Vacuum wavelength accuracy	±0.1 ppm	
Compensated system accuracy	±1.0 ppm	When used together with RCU10 environmental compensator
Range	0 - 30 m 0 - 60 m	With standard linear optics With long range linear optics
Analogue output signal period	316 nm	Retroreflector interferometer
Digital quadrature nominal output resolutions	79, 158, 316 and 633 nm	DIP switch selectable
Output update rates	1, 2, 4, 8 and 16 MHz	DIP switch selectable
Maximum velocity	2 m/sec	
Output formats	RS422 differential digital quadrature 1 V peak to peak sine/cosine signals	
Laser status outputs (24 V active low signals)	Beam block Overspeed Unstable Beam low	Asserted when signal strength ≤10% Asserted if invalid quadrature transition detected Asserted if laser unstable Asserted if signal strength ≤20%
Power supply requirements	24 V @ 2.0 A 24 V @ 1.2 A 24 V @ 0.7 A	Inrush (first 10 ms) Warm-up (~15 mins) Operation at room temperature (20 °C)
HS20 weight	3.1 kg	
Operating environment Pressure Humidity Temperature	 650 mbar to 1150 mbar 0% to 95% RH 0 °C to 40 °C	 Normal atmospheric Non-condensing

HS20 output signals

Digital incremental - RS422 digital quadrature



Analogue incremental - 1 Vpp differential sine and cosine



For further details regarding installation and operation please see HS20 installation and user's guide

Legislative - Laser safety:

In accordance with IEC/EN60825-1, IEC/EN60825-2 and US standards 21CFR 1040 and ANSI Z136.1, Renishaw HS20 lasers are Class II lasers and safety goggles are not required, since the blink reaction of a human will protect the eye from damage. Do not stare into the beam or shine it into the eyes of others. It is safe to view a diffuse-reflected beam. Do not dismantle the unit in any way; doing so may expose laser radiation in excess of Class II limits.

Plane mirror interferometry:

The standard HS20 laser system is not suitable for plane mirror interferometry (PMI).

For custom PMI applications please contact the UK support team:
LCPDtechnicalsupport@renishaw.com

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

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