

FORTiS-S™ enclosed encoder system


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Specification

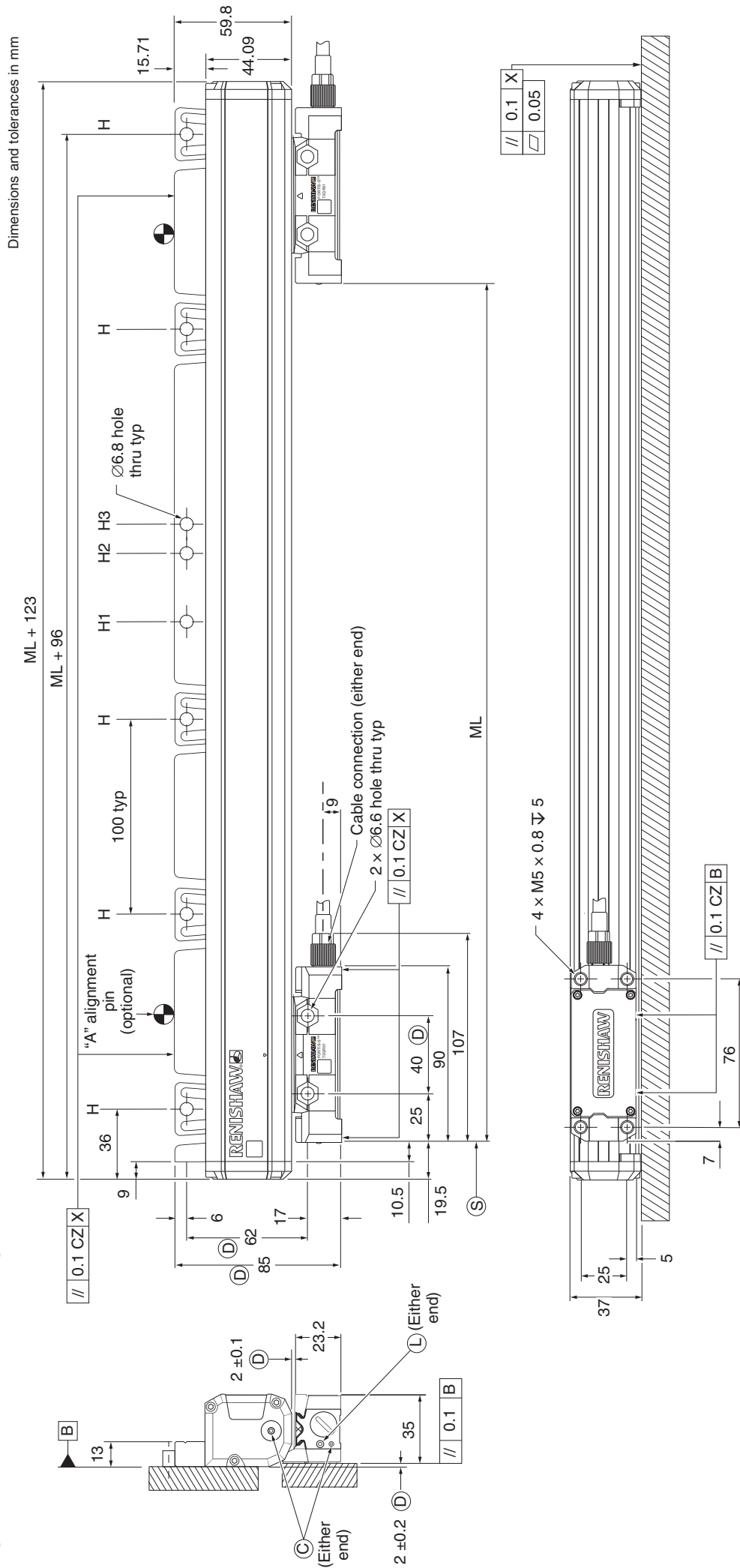
Measuring standard	Renishaw stainless-steel scale with single track absolute encoding
Coefficient of thermal expansion (at 20 °C)	10.1 ±0.2 µm/m/°C
Thermal datum	At centre position (encoder position of 0.5 × measuring length)
Measuring lengths available (mm)	140, 240, 340, 440, 540, 640, 740, 840, 940, 1040, 1140, 1240, 1340, 1440, 1540, 1640, 1740, 1840, 2040, 2240, 2440, 2640, 2840, 3040
Accuracy grades	High grade: ±3 µm Standard grade: ±5 µm
Resolution*	0.5 nm, 1 nm, 1.25 nm, 10 nm, 12.5 nm, 25 nm, 50 nm
Sub-Divisional Error (typical)	±40 nm
Jitter (RMS)	10 nm
Absolute position serial interface	BiSS C, FANUC ($\alpha/\alpha i$), Mitsubishi, Panasonic, Siemens DRIVE-CLiQ (with external interface)
Encoder electrical connection	Cable connector M12 custom (customer configurable exit direction)
Controller electrical connection	8-way M12, FANUC 20-way, 10-way Mitsubishi, 17-way M23, 9-way D-Type, 14-way LEMO, flying lead
Cable length	Up to 100 m (with extension cable)
Power supply	5 V ±10% 1.25 W maximum (250 mA @ 5 V)
Set-up LED	Signal strength indicator LED
Maximum speed	4 m/s
Acceleration (readhead relative to scale)	< 200 m/s ² in measuring direction
Moving force (maximum force required to move the readhead through the seals)	< 5 N
Vibration (55 Hz to 2000 Hz)	Housing: < 300 m/s ² to IEC 60068-2-6 Readhead: < 300 m/s ² to IEC 60068-2-6
Shock 11 ms half-sine	< 300 m/s ² IEC 60068-2-27
Operating temperature	0 °C to 50 °C
Environment protection	IP53 when installed correctly, IP64 with air purge
Air purge requirements	Air supply pressure = 1 bar at encoder At correct supply pressure the supplied air connection fitting restricts the air flow rate to 2 l/min
Weight	0.27 kg + 2.0 kg/m

* See page 2.

Resolution per accuracy grade and serial interface – standard options

Accuracy grade	Serial interface	Resolution nm	
		Single	Dual
3 μm	BiSS C, Mitsubishi, Panasonic, Siemens DRIVE-CLiQ	1	
	FANUC		1 / 0.5
			10 / 1.25
5 μm	BiSS C, Mitsubishi, Panasonic, Siemens DRIVE-CLiQ	10	
		50	
	FANUC		50 / 12.5
			50 / 25

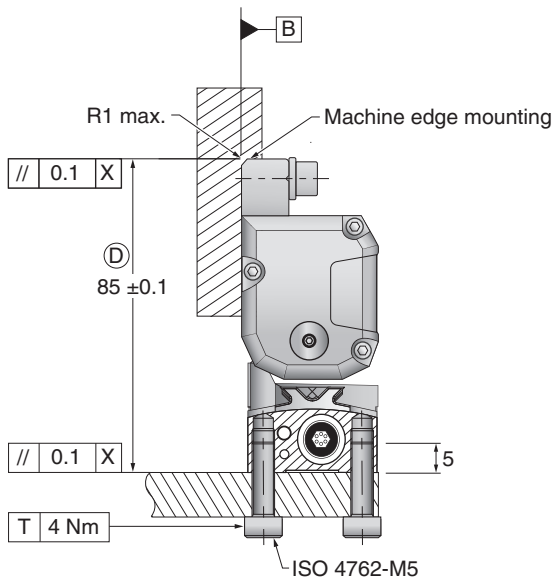
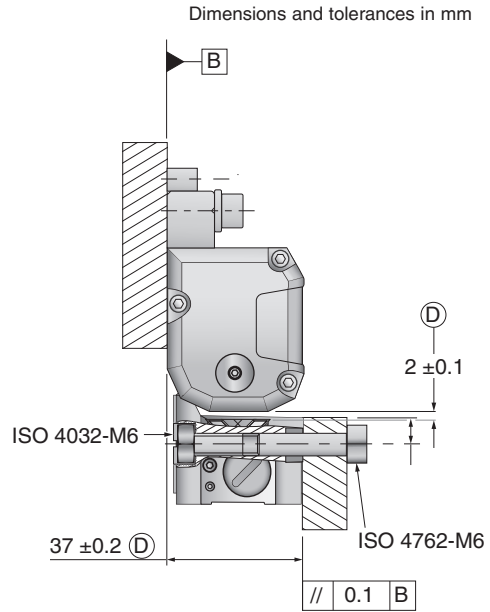
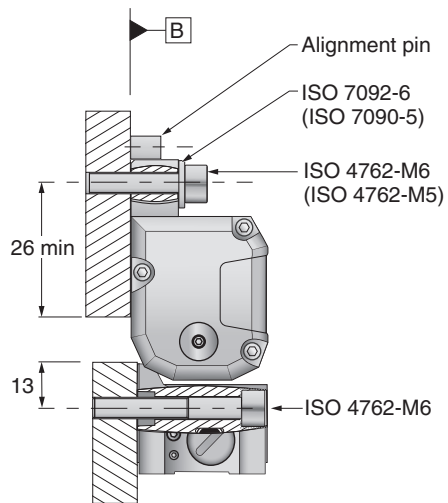
System installation drawings



KEY

- A = Recommended extrusion alignment pin locations (if required)
- Adjacent to first and last flexure holes plus every 300–500 mm
- C = Compressed air inlet fitting
- D = Required mounting dimensions
- H = Flexure mounting holes
- H1 = Fixed mounting hole (preferred)
- H2 and H3 = Alternative mounting holes (non-preferred)
- L = LED set-up illumination
- ML = Measuring length
- S = Start of measuring length
- X = Machine guideway/axis datum

Mounting orientations



KEY

D = Required mounting dimensions
X = Machine guideway/axis datum

NOTES

- ▶ Side elevations show alternative mounting orientations.
- ▶ Screws sizes in brackets are permissible alternatives.

Nomenclature

	F	S	1	0	0	B	304	S	C	36B	X	001	X
Product													
F - FORTiS													
Series													
S - Standard (37 mm)													
N - Narrow (18 mm)													
Encoder type													
1 - Absolute													
Scale type													
0 - 30 µm B code RTLA													
End caps													
0 - Standard													
1 - Small end caps (N type only)													
Lip seal configuration													
A - DuraSeal™ × 1													
B - DuraSeal × 2 (S type only)													
Measuring length*													
FORTiS-S 014 = 140 mm to 304 = 3040 mm													
FORTiS-N 007 = 70 mm to 204 = 2040 mm													
System accuracy													
S - Standard accuracy													
H - High accuracy													
Thermal datum position													
C - Centrally located†													
Serial interface													
36B - BiSS 36 bit													
37F - 37 bit FANUC α and αi													
40N - 40 bit Mitsubishi 4 wire													
48P - 48 bit Panasonic													
28D - Siemens DRIVE-CLiQ 28 bit (50 nm only)													
30D - Siemens Drive-CLiQ 30 bit (10 nm only)													
34D - Siemens Drive-CLiQ 34 bit (1 nm only)													
Functional Safety													
X - Standard													
S - Functional Safety (BiSS Safety and Siemens DRIVE-CLiQ only)													
Resolution													
001 - 1 nm (all protocols except FANUC)													
010 - 10 nm (all protocols except FANUC)													
050 - 50 nm (all protocols except FANUC)													
T12 - 1 / 0.5 nm (FANUC only)													
108 - 10 / 1.25 nm (FANUC only)													
502 - 50 / 25 nm (FANUC only)													
504 - 50 / 12.5 nm (FANUC only)													
Additional field													
X - Standard, no option													
D - Standard encoder with one additional readhead													

*For all permissible measuring length options refer to specification table.

†For other datum requirements contact your local Renishaw representative.

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