

FORTiS-S™ enclosed encoder system



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, 3240
Accuracy grades	High grade: ≤ ±3 µm Standard grade: ≤ ±5 µm
Resolution ¹	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 (α/α_i), Mitsubishi, Panasonic, Siemens DRIVE-CLiQ (with external interface), Yaskawa
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 2 000 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

¹ 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, Yaskawa	1	
	FANUC		1 / 0.5
5 µm	BiSS C, Mitsubishi, Panasonic, Siemens DRIVE-CLiQ, Yaskawa	10	
		50	
	FANUC		50 / 12.5
			50 / 25

NOTE: For BiSS C encoders, the standard position word length is 36 bits long. However, to accommodate controllers that require a shorter position word length, versions with 26 bit or 32 bit word length are also available (with standard 5 µm accuracy grade only).

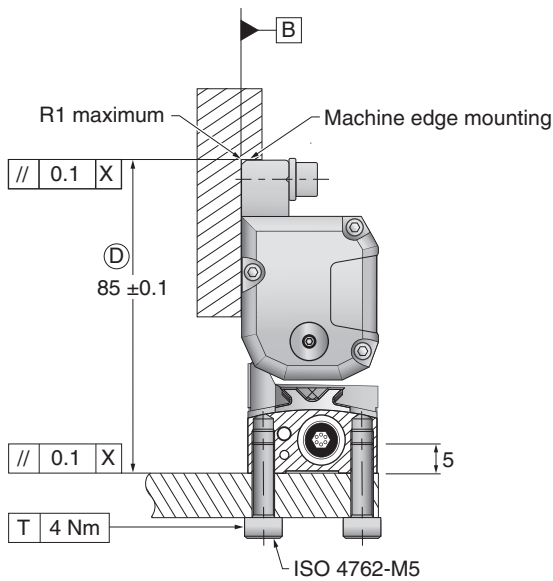
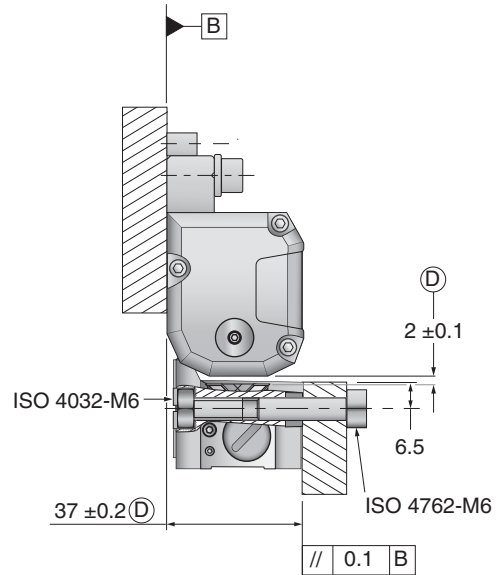
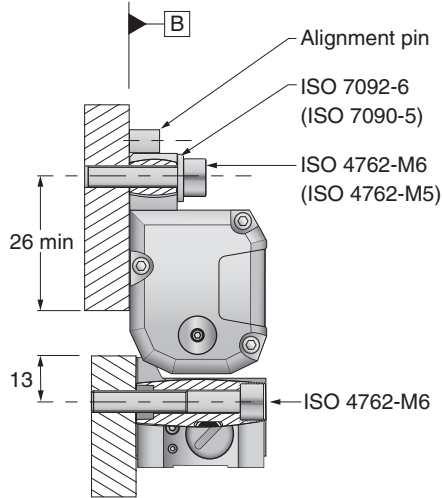
Position word length	Nomenclature code	Accuracy grade	Resolution options (nm)		
			1	10	50
36 bit	36B	3 µm	OK	N/A	N/A
		5 µm		N/A	OK
32 bit	32B		N/A	OK	N/A
26 bit	26B		N/A	N/A	OK

NOTE: For Siemens DRIVE-CLiQ encoders, the position word length is linked to the resolution, which in turn is linked to the accuracy grade. Here are the three options.

Position word length	Nomenclature code	Accuracy grade	Resolution options (nm)
34 bit	34D	3 µm	1
30 bit	30D	5 µm	10
28 bit	28D	5 µm	50

Mounting orientations

Dimensions and tolerances in mm



KEY

D = Required mounting dimensions

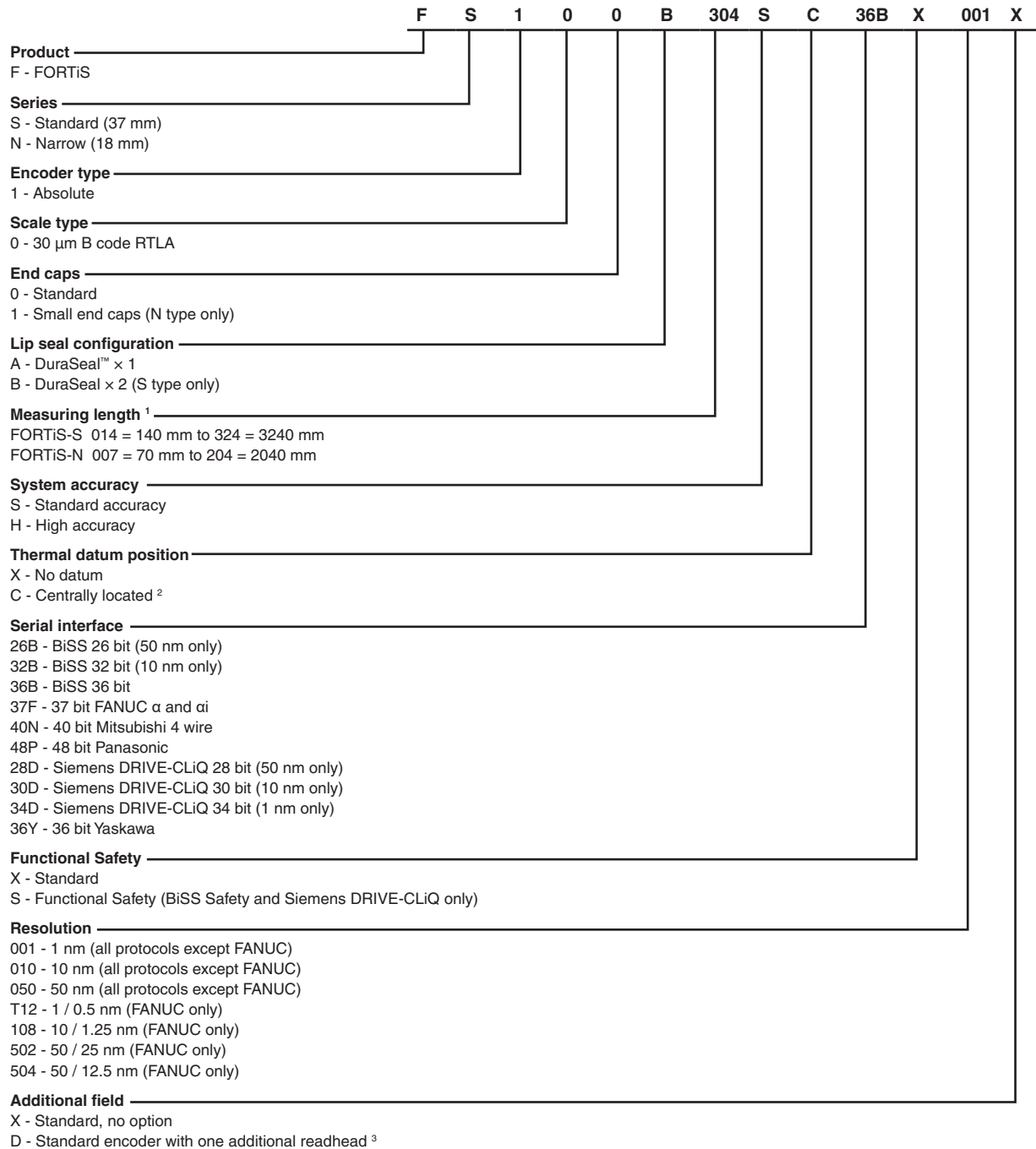
X = Machine guideway/axis datum

NOTES:

1. Side elevations show alternative mounting orientations.

2. Screws sizes in brackets are permissible alternatives.

Nomenclature



¹ For all permissible measuring length options refer to specification table.

² For other datum requirements contact your local Renishaw representative.

³ For further information see the manual *FORTiS-S enclosed encoder system with multiple readheads* (Renishaw part no. L-6725-9176).

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