RENISHAW
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FORTiS-N™ enclosed encoder system

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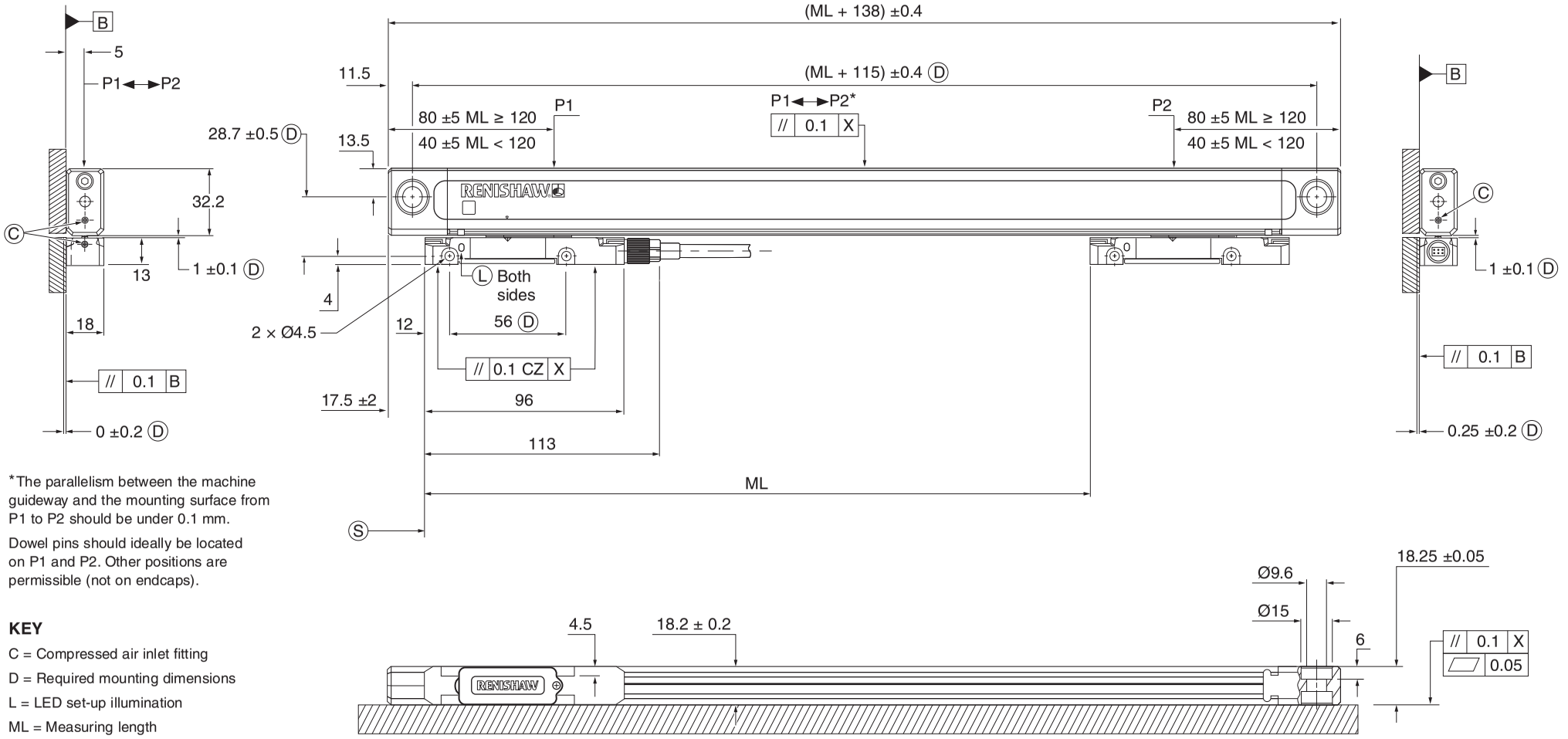
Specification

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)	70, 120, 170, 220, 270, 320, 370, 420, 470, 520, 570, 620, 670, 720, 770, 820, 920, 1020, 1140, 1240, 1340, 1440, 1540, 1640, 1740, 1840, 2040 (mounting spar available – recommended for > 620 mm length)
Accuracy grades	High grade: ±3 µm Standard grade: ±5 µm
Resolution	1 nm, 1.25 nm (FANUC only), 10 nm, 12.5 nm (FANUC only), 50 nm
Absolute position protocols	BiSS C, Siemens DRIVE-CLiQ (with external interface), FANUC (α/αi), Panasonic, Mitsubishi
Encoder electrical connection	Cable connector M12 custom
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/s² in measuring direction
Moving force (maximum force required to move the readhead through the seals)	< 4 N
Vibration (55 Hz to 2000 Hz)	Readhead: < 300 m/s² to IEC 60068-2-6 Housing without mounting spar: < 200 m/s² to IEC 60068-2-6 Housing with mounting spar: < 300 m/s² to IEC 60068-2-6
Shock 11 ms half-sine	< 300 m/s² 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	0.11 kg + 0.45 kg/m

System installation drawings – standard end caps

(ML 320 mm shown)

Dimensions and tolerances in mm



*The parallelism between the machine guideway and the mounting surface from P1 to P2 should be under 0.1 mm.

Dowel pins should ideally be located on P1 and P2. Other positions are permissible (not on endcaps).

KEY

C = Compressed air inlet fitting

D = Required mounting dimensions

L = LED set-up illumination

ML = Measuring length

P = Gauging points for alignment

S = Start of measuring length

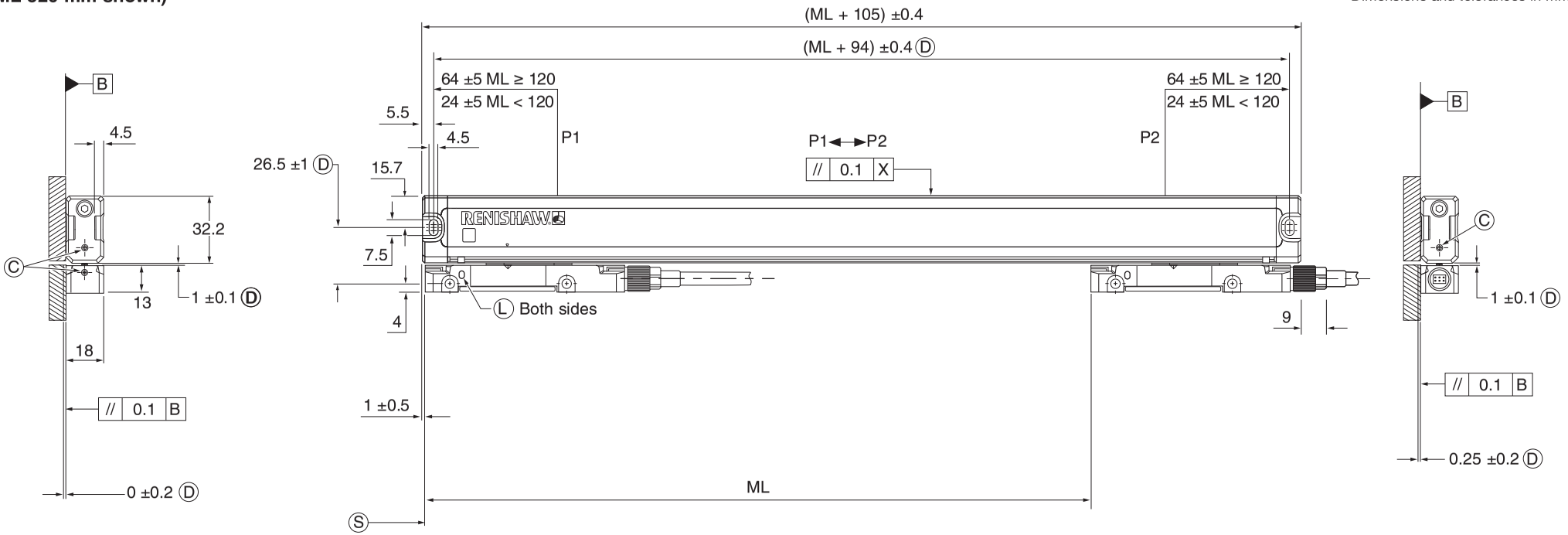
X = Machine guideway/axis datum

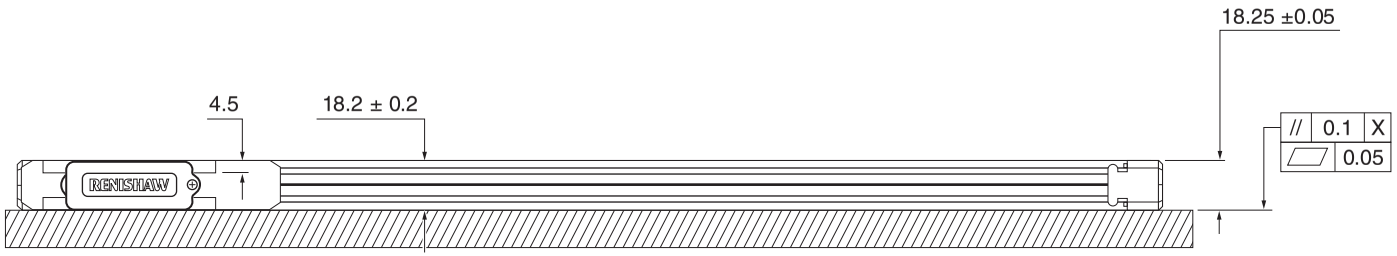
ML	70	120	170	220	270	320	370	420	470	520	570	620	670	720	770	820	920	1020	1140	1240	1340	1440	1540	1640	1740	1840	2040

System installation drawings – short end caps

(ML 320 mm shown)

Dimensions and tolerances in mm





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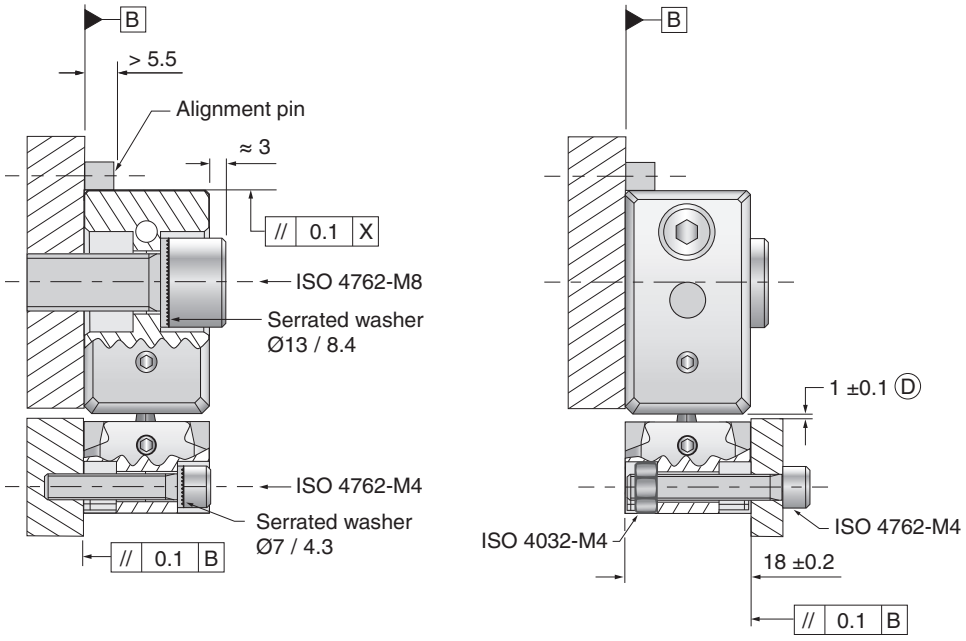
Mounting orientations – standard end caps

Dimensions and tolerances in mm



KEY

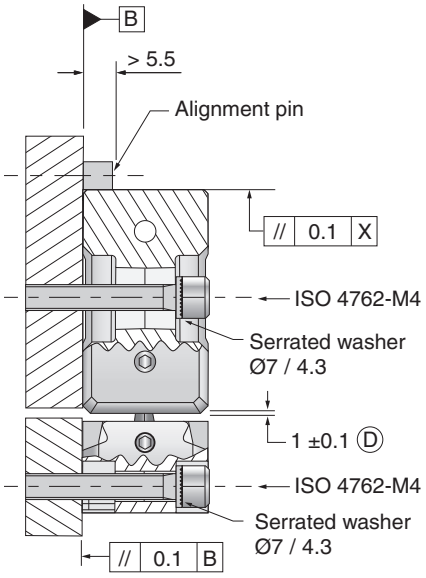
D = Required mounting dimensions

X = Machine guideway/axis datum

NOTES

- Side elevations show alternative mounting orientations.
- Alignment pin and machine edge mounting options to mate directly to the top face of the extrusion.

Mounting orientation – short end caps



KEY

D = Required mounting dimensions

X = Machine guideway/axis datum

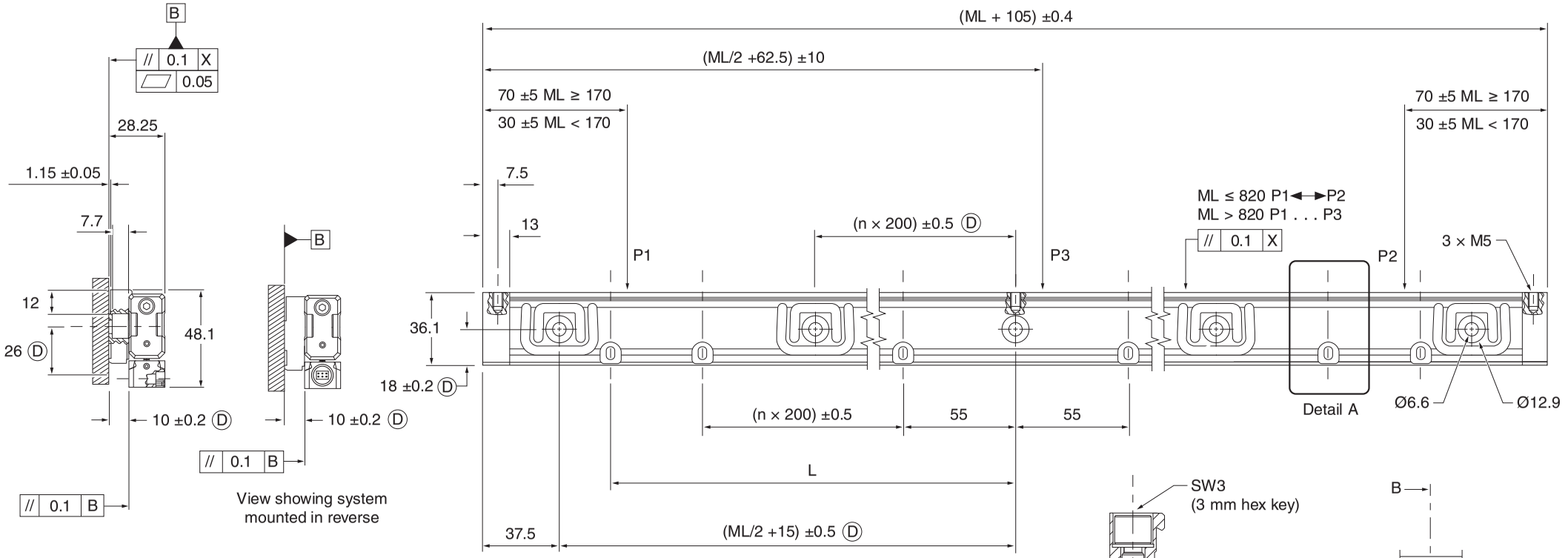
NOTES

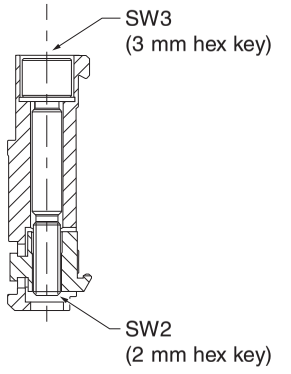
- Side elevation shows alternative mounting orientation.
- Extrusion mounting can be machine edge or dowel pins.

Mounting spar installation drawing

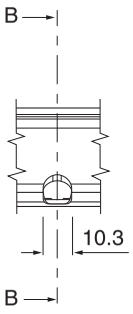
(ML 620 mm shown)

Dimensions and tolerances in mm





Section B–B through the spar



Detail A
Showing clamp installed

KEY

D = Required mounting dimensions

ML = Measuring length

P = Gauging points for alignment

X = Machine guideway/axis datum

ML	70	120	170	220	270	320	370	420	470	520	570	620	670	720
L	37.5	55	75	100	115	140	175	200	225	250	275	300	325	350
n	-	-	-	-	-	-	-	-	-	-	-	1	1	1

ML	770	820	920	1020	1140	1240	1340	1440	1540	1640	1740	1840	2040
L	375	400	450	500	550	640	655	710	760	810	855	910	1010
n	1	1	1	2	2	2	2	3	3	3	3	4	4

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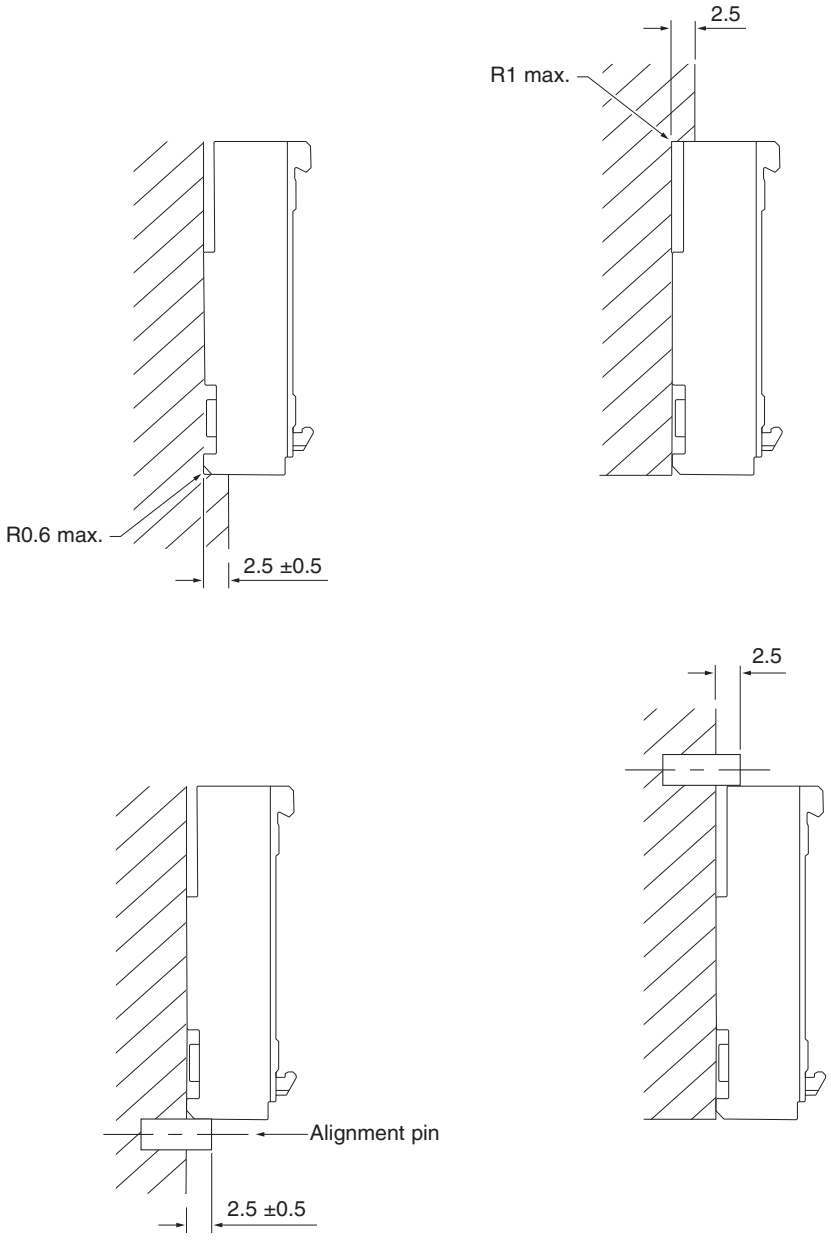
Spar mounting options

Dimensions and tolerances in mm



For worldwide contact details, visit www.renishaw.com/contact

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