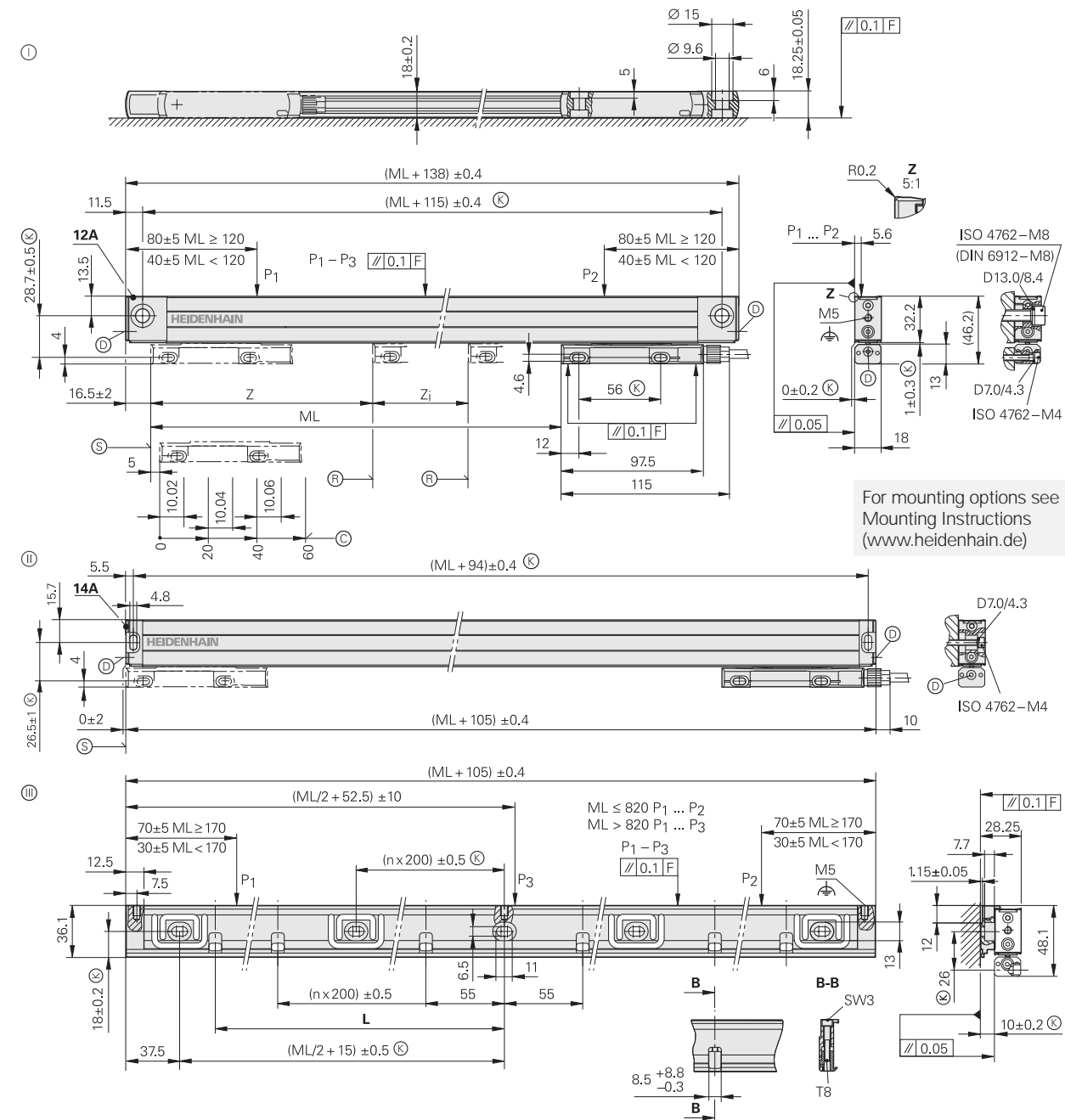


LS 400 series

Incremental linear encoders with slimline scale housing

- For limited installation space



ML	70	120	170	220	270	320	370	420	470	520	570	620	670	720	770	820	870	920	970	1020	1070	1140	1240	1340	1440	1540	1640	1740	1840	2040
L	37.5	55	75	100	115	140	175	200	225	250	275	300	325	350	375	400	425	450	475	500	515	555	610	655	710	760	810	855	910	1010

- mm
 Tolerancing ISO 8015
 ISO 2768 - m H
 < 6 mm: ±0.2 mm
- ⊕ = End block 12A; for mounting with and without mounting spar
 - ⊕ = End block 14A; installation with mounting spar
 - ⊕ = Mounting spar MSL 41
 - F = Machine guideway
 - P = Gauging points for alignment
 - ⊕ = Required mating dimensions
 - ⊕ = Reference mark position on LF 4x7
Two reference marks for measuring lengths
 - 70 ... 1020 | 1140 ... 2040
z = 35 mm | z = 45 mm
z₁ = ML - 70 mm | z₁ = ML - 90 mm
 - ⊕ = Reference-mark position on LS 4x7 C
 - ⊕ = Compressed air inlet
 - ⊕ = Beginning of measuring length (ML)
 - ⇨ = Direction of scanning unit motion for output signals in accordance with interface description



LS 4x7 without mounting spar

LS 4x7 with mounting spar

Specifications	LS 487	LS 477												
Measuring standard	Glass scale with DIADUR grating, grating period 20 µm													
Coefficient of linear expansion	$\alpha_{\text{therm}} \approx 8 \times 10^{-6} \text{ K}^{-1}$ (mounting type ⊕/⊕); <i>with mounting spar</i> : $\alpha_{\text{therm}} \approx 9 \times 10^{-6} \text{ K}^{-1}$ (mounting type ⊕)													
Accuracy grade*	± 5 µm; ± 3 µm													
Measuring length ML* in mm	Mounting spar* up to ML 1240 optional, necessary as of ML 1340													
	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	
Reference marks* LS 4x7	<ul style="list-style-type: none"> • Selectable with magnets every 50 mm • 1 reference mark at midpoint of measuring length • 2 reference marks, each 35 mm (for ML ≤ 1020) or 45 mm (for ML ≥ 1140) from the beginning and end of measuring length 													
	LS 4x7C Distance-coded													
Incremental signals	~ 1 V _{pp}	TTL x 5		TTL x 10		TTL x 20								
Integrated interpolation*	-	5-fold		10-fold		20-fold								
Signal period	20 µm	4 µm		2 µm		1 µm								
Cutoff frequency	-3 dB	≥ 160 kHz		-		-								
Scanning frequency*	-	100 kHz		50 kHz		100 kHz		50 kHz						
Edge separation a	-	≥ 0.5 µs		≥ 1 µs		≥ 0.25 µs		≥ 0.5 µs						
Measuring step	0.5 µm ¹⁾	1 µm ²⁾		0.5 µm ²⁾		0.25 µm ²⁾								
Electrical connection	Separate adapter cable (1 m/3 m/6 m/9 m) connectable to mounting block													
Cable length³⁾	≤ 150 m				≤ 100 m									
Power supply without load	5 V DC ± 5 % / < 120 mA				5 V DC ± 5 % / < 140 mA									
Traversing speed	≤ 120 m/min		≤ 120 m/min	≤ 60 m/min	≤ 120 m/min	≤ 60 m/min	≤ 30 m/min	≤ 60 m/min	≤ 30 m/min					
Required moving force	≤ 5 N													
Vibration 55 Hz to 2000 Hz	<i>Without mounting spar</i> : ≤ 100 m/s ² (EN 60068-2-6) <i>With mounting spar and cable outlet at right</i> : ≤ 200 m/s ² , <i>left</i> : 100 m/s ² (EN 60068-2-6)													
Shock 11 ms	≤ 300 m/s ² (EN 60068-2-27)													
Acceleration	≤ 100 m/s ² in measuring direction													
Operating temperature	0 °C to 50 °C													
Protection EN 60529	IP 53 when installed according to mounting instructions and information; IP 64 with compressed air from DA 400													
Weight	0.4 kg + 0.5 kg/m measuring length													

*Please indicate when ordering
¹⁾ Recommended for position measurement

²⁾ After 4-fold evaluation in the subsequent electronics
³⁾ With HEIDENHAIN cable