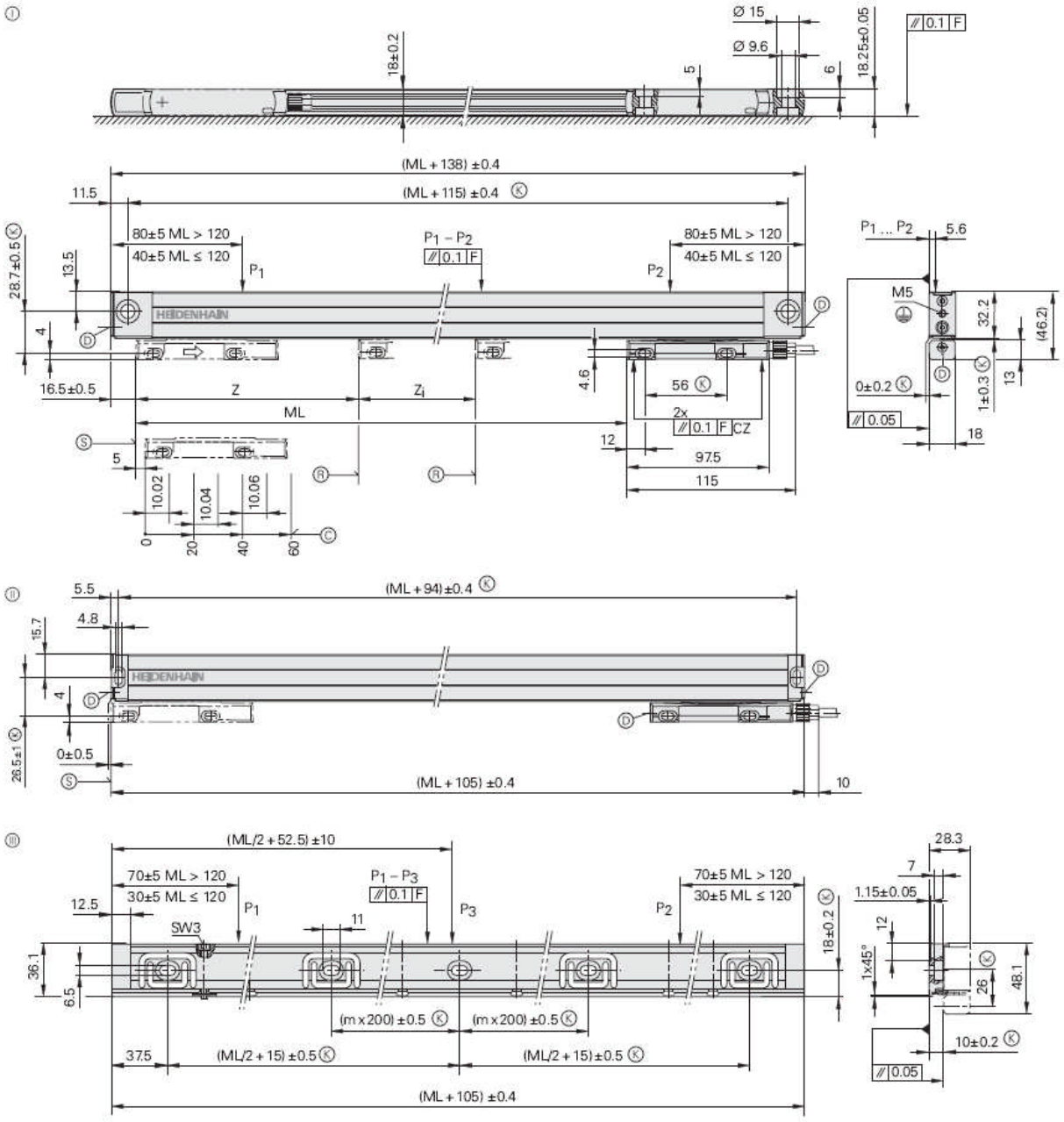
LS 400 Series

- **Incremental linear encoder for measuring steps to 0.5 µm**
- **For limited installation space**



Dimensions in mm

Tolerancing ISO 8015
ISO 2768 - m H
< 6 mm: ±0.2 mm

Ⓘ = Without mounting spar (with M8 screws)
Ⓘⓘ = Short end piece, as replacement for predecessor with and without mounting spar. If attached directly with M4 screws, than specifications are restricted.
Ⓘⓘⓘ = With mounting spar

F = Machine guideway
P = Gauging points for alignment
ML ≤ 820 $P_1 - P_2$
ML > 820 $P_1 - P_3$
Ⓚ = Required mating dimensions
Ⓓ = Compressed air inlet
Ⓡ = Reference-mark position on LS 4x7
1 reference mark at midpoint of measuring length ML = 70
2 reference marks for measuring lengths

120 ... 1020	1140 ... 2040
Z = 35 Zi = ML – 70	Z = 45 Zi = ML – 90

Ⓒ = Reference-mark position on LS 4x7 C

Ⓢ = Beginning of measuring length (ML)
⇨ = Direction of scanning unit motion for output signals in accordance with interface description

Mounting spar

ML	m
70 ... 520	0
570 ... 920	1
1020 ... 1340	2
1440 ... 1740	3
1840 ... 2040	4

LS 487 without mounting spar

LS 487 with mounting spar

Specifications	LS 487	LS 477						
Measuring standard Expansion coefficient	Glass scale with DIADUR graduation $\alpha_{therm} \approx 8 \times 10^{-6}$ K^{-1} (mounting type ①/⑪); *with mounting spar:* $\alpha_{therm} \approx 9 \times 10^{-6}$ K^{-1} (mounting type ⑩)							
Accuracy grade*	± 5 µm; ± 3 µm							
Measuring length ML* in mm	Mounting spar* optional 70 120 170 220 270 320 370 420 470 520 570 620 670 720 770 820 870 920 1020 1140 1240							
	Mounting spar* necessary 1340 1440 1540 1640 1740 1840 2040							
Reference marks* *LS 487* *LS 487 C*	Selectable with magnets every 50 mm Standard: *ML 70 mm:* 1 in the center, *up to ML 1020 mm:* 2, each 35 mm from beginning/end of ML, *from ML 1140 mm:* 2, each 45 mm from beginning/end of ML Distance-coded							
Incremental signals	∿ 1 V_{PP}	⊓⊔ TTL x 5		⊓⊔ TTL x 10			⊓⊔ TTL x 20	
Grating period Integrated interpolation* Signal period	20 µm – 20 µm	20 µm 5-fold 4 µm		20 µm 10-fold 2 µm			20 µm 20-fold 1 µm	
Cutoff frequency –3dB	≥ 160 kHz	–		–			–	
Scanning frequency* Edge separation a	–	100 kHz ≥ 0.5 µs	50 kHz ≥ 1 µs	100 kHz ≥ 0.25 µs	50 kHz ≥ 0.5 µs	25 kHz ≥ 1 µs	50 kHz ≥ 0.25 µs	25 kHz ≥ 0.5 µs
Measuring step	0.5 µm[1]	1 µm[2]		0.5 µm[2]			0.25 µm[2]	
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
Power supply without load	5 V ± 5 %/< 120 mA	5 V ± 5 %/< 140 mA						
Electrical connection	Separate adapter cable (1 m/3 m/6 m/9 m) connectable to mounting block							
Cable length[3]	≤ 150 m	≤ 100 m						
Required moving force	≤ 5 N							
Vibration 55 to 2000 Hz **Shock** 11 ms **Acceleration**	*Without mounting spar:* ≤ 100 m/s^2 (IEC 60068-2-6) *With mounting spar and cable outlet right/left:* ≤ 200 m/s^2/100 m/s^2 (IEC 60068-2-6) ≤ 300 m/s^2 (IEC 60068 2 27) ≤ 100 m/s^2 in measuring direction							
Operating temperature	0 °C to 50 °C							
Protection IEC 60529	IP 53 when installed according to mounting instructions, IP 64 with compressed air from DA 300							
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 evaluation electronics
[3] With HEIDENHAIN cable