



HEIDENHAIN



Product Information

LC 116

LC 196 F/LC 196 M

LC 416

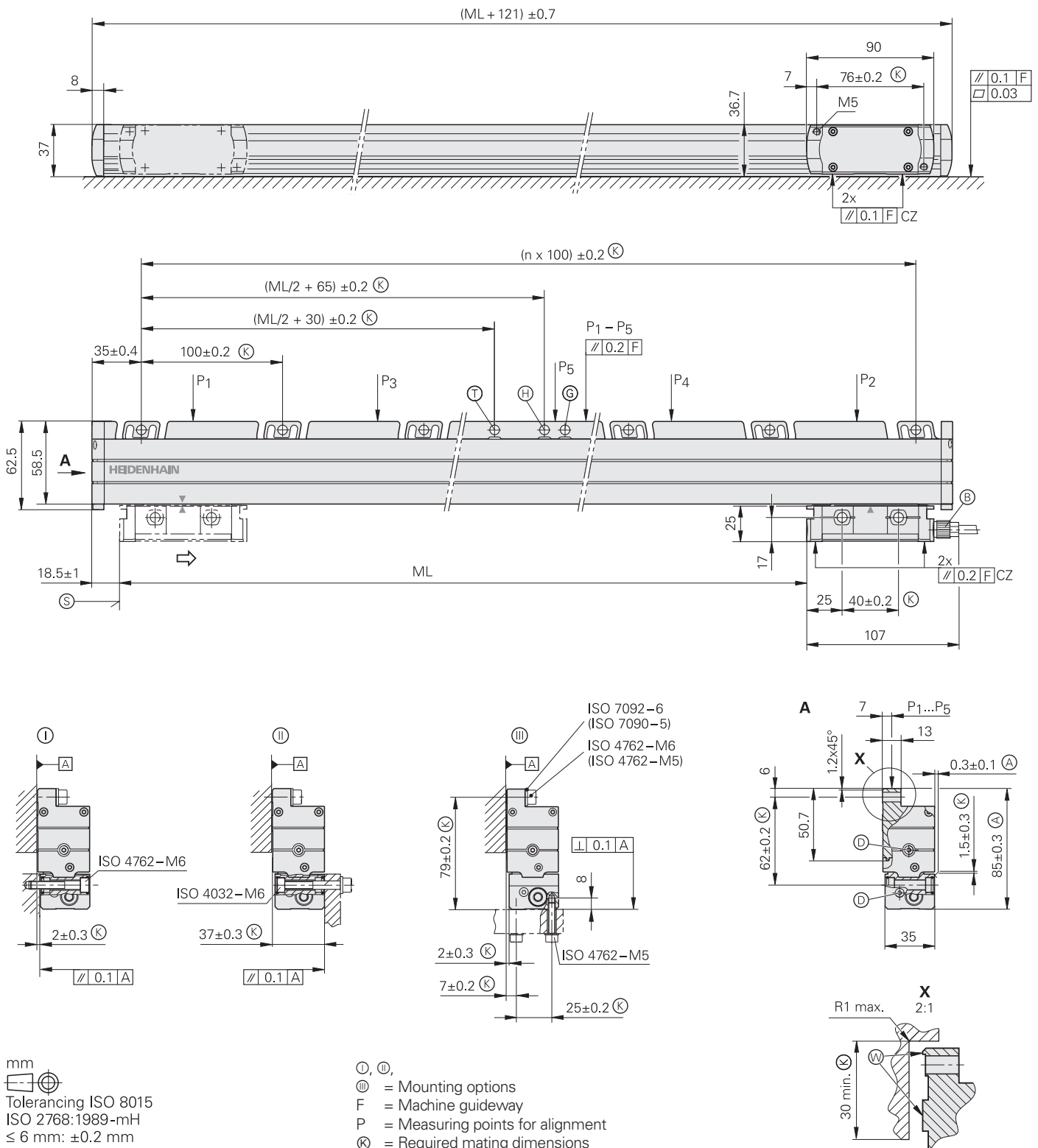
LC 496 F/LC 496 M

Absolute Linear Encoders
with Optimized Scanning

LC 100 series

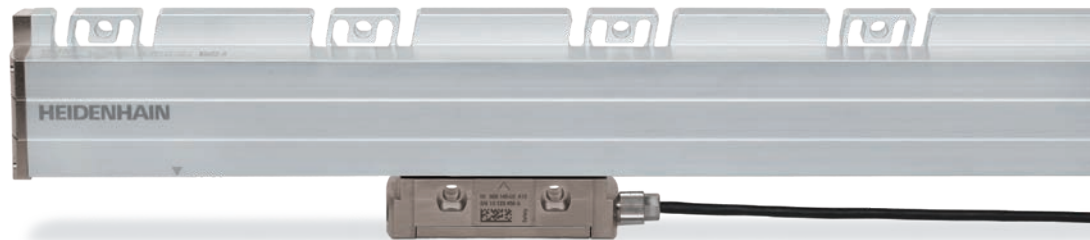
Absolute linear encoders with full-size scale housing

- High vibration tolerance
- Flat-lying installation possible
- Optimized scanning



mm
 Tolerancing ISO 8015
 ISO 2768:1989-mH
 ≤ 6 mm: ±0.2 mm

- ⓪, Ⓜ, Ⓝ = Mounting options
- F = Machine guideway
- P = Measuring points for alignment
- (K) = Required mating dimensions
- (A) = Alternative mating dimensions
- (B) = Cable connection, usable at either end
- (D) = Compressed air inlet with integrated throttle, usable at either end
- (T) = Mechanical fixed point (preferred)
- (H) = Mechanical fixed point (compatible with predecessor model)
- (G) = Mechanical fixed point (repeated at an interval of 100 mm)
- (S) = Beginning of measuring length ML (= 20 mm absolute)
- (W) = Mating surfaces
- ⇒ = Direction of motion of the scanning unit for ascending position values



Specifications	LC 116	LC 196 F	LC 196 M
Measuring standard Coefficient of linear expansion	DIADUR glass scale with absolute track and incremental track; grating period: 20 µm $\alpha_{\text{therm}} \approx 8 \cdot 10^{-6} \text{ K}^{-1}$		
Accuracy grade	±3 µm up to a measuring length of 3040 mm (LC 196 M: up to 2040 mm); ±5 µm		
Measuring length (ML)* in mm	140 1540 4040	240 1640 4240	340 440 540 640 740 840 940 1040 1140 1240 1340 1440 1740 1840 2040 2240 2440 2640 2840 3040 3240 3440 3640 3840
Interface ¹⁾	EnDat 2.2	Fanuc Serial Interface/αi Interface	Mitsubishi high speed interface
Ordering designation	EnDat22	Fanuc05	Mit03-04
Measuring step At ±3 µm At ±5 µm	0.001 µm 0.010 µm	αi interface/α interface 0.00125 µm/0.010 µm 0.0125 µm/0.050 µm	0.001 µm 0.010 µm
Clock frequency (calculation time t_{cal})	≤ 16 MHz (≤ 5 µs)	–	–
Electrical connection	Separate adapter cable (1 m/3 m/6 m/9 m), connectable at either end of mounting block		
Cable length	≤ 100 m ²⁾	≤ 50 m	≤ 30 m
Supply voltage	DC 3.6 V to 14 V		
Power consumption (max.)	3.6 V: ≤ 1.1 W; 14 V: ≤ 1.3 W		
Traversing speed	≤ 180 m/min (max. acceleration in measuring direction ≤ 100 m/s ²)		
Required moving force	≤ 4 N		
Vibration 55 Hz to 2000 Hz affecting the Shock 11 ms	Housing: ≤ 200 m/s ² (EN 60068-2-6) Scanning unit: ≤ 200 m/s ² (EN 60068-2-6) ≤ 300 m/s ² (EN 60068-2-27)		
Operating temperature	0 °C to 50 °C		
Protection class EN 60529 ³⁾	IP53 when installed in conformity with instructions in the brochure; IP64 with sealing air (air purity class [3:4:2] as per ISO 8573-1:2010)		
Mass	0.55 kg + 2.9 kg/m of measuring length		

Due to optimized scanning, the encoders have only one pair of sealing lips.

* Please select when ordering

¹⁾ Connectable to Siemens interface via EIB 2391 S or EIB 3392 S

²⁾ With cable from HEIDENHAIN: see the *Interfaces of HEIDENHAIN Encoders* brochure

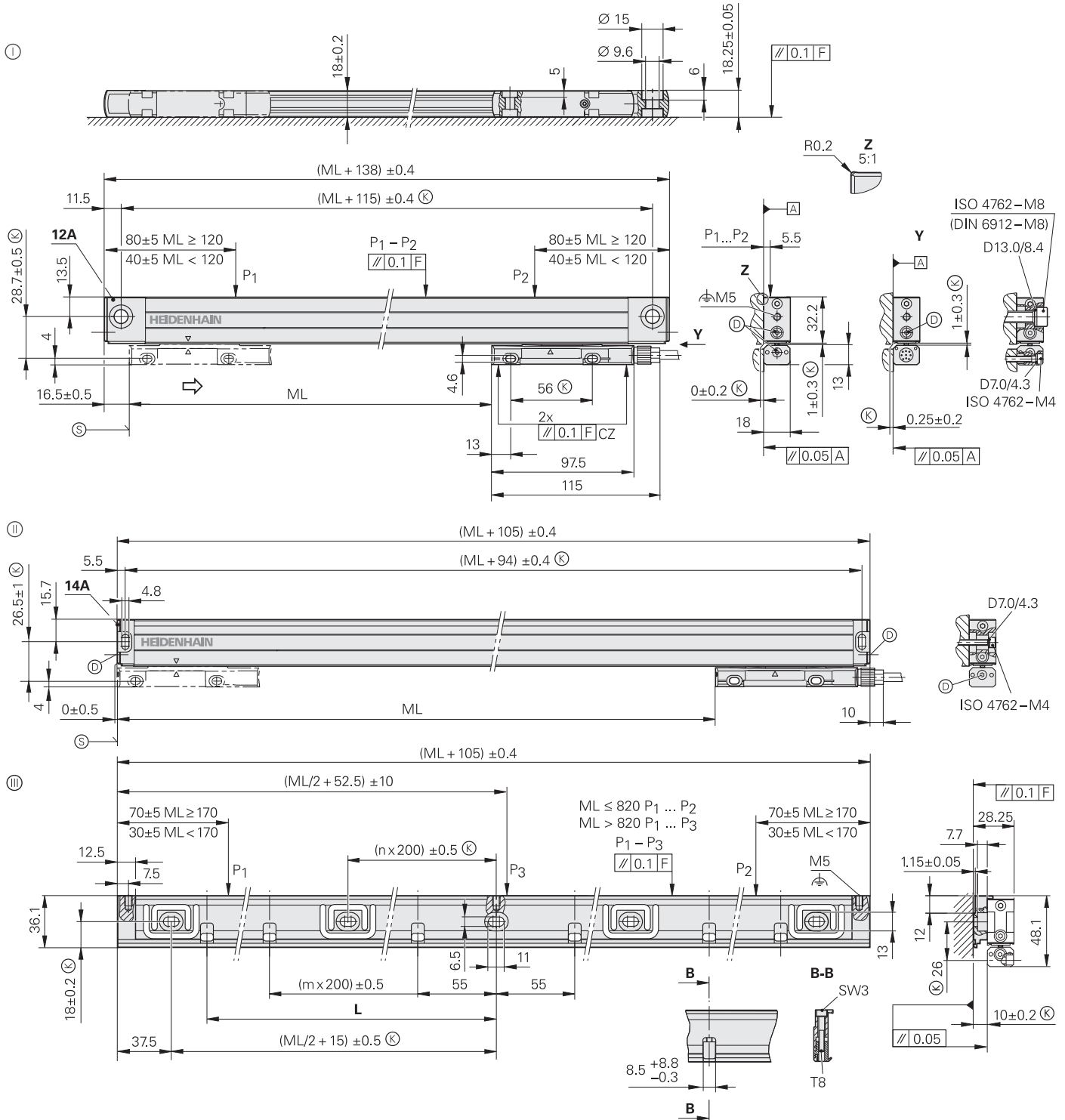
³⁾ In the application, the LC must be protected from the ingress of particles.

In addition, contamination level 2 must be complied with in the micro-environment (see EN 60664-1).

LC 400 series

Absolute linear encoders with slimline scale housing

- Low installation space requirements
- Optimized scanning



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
L	37.5	55	75	100	115	140	175	200	225	250	275	300	325	350	375	400	450	500	555	610	655	710	760	810	855	910	1010

mm

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

- Ⓚ = 12A end block; for mounting with and without mounting spar
- Ⓛ = 14A end block; for mounting with mounting spar
(if directly attached with M4 screws, then specifications are subject to constraints)
- Ⓜ = MSL 41 mounting spar
- F = Machine guideway
- P = Measuring points for alignment
- Ⓚ = Required mating dimensions
- Ⓛ = Compressed air inlet with integrated throttle
- Ⓜ = Beginning of measuring length ML (= 20 mm absolute)
- ⇒ = Direction of motion of the scanning unit for ascending position values



Specifications	LC 416	LC 496 F	LC 496 M																												
Measuring standard Coefficient of linear expansion	DIADUR glass scale with absolute track and incremental track; grating period: 20 µm $\alpha_{\text{therm}} \approx 8 \cdot 10^{-6} \text{ K}^{-1}$ (mounting type ○/⊙); <i>with mounting spar</i> : $\alpha_{\text{therm}} \approx 9 \cdot 10^{-6} \text{ K}^{-1}$ (mounting type ⊙)																														
Accuracy grade	±3 µm, ±5 µm																														
Measuring length (ML)* in mm	Mounting spar* or clamping elements* up to ML 1240 optional; necessary for ML 1340 or greater <table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"> <tr> <td>70</td><td>120</td><td>170</td><td>220</td><td>270</td><td>320</td><td>370</td><td>420</td><td>470</td><td>520</td><td>570</td><td>620</td><td>670</td><td>720</td> </tr> <tr> <td>770</td><td>820</td><td>920</td><td>1020</td><td>1140</td><td>1240</td><td>1340</td><td>1440</td><td>1540</td><td>1640</td><td>1740</td><td>1840</td><td>2040</td><td></td> </tr> </table>			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	
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Supply voltage	DC 3.6 V to 14 V																														
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Traversing speed	≤ 180 m/min (max. acceleration in measuring direction ≤ 100 m/s ²)																														
Required moving force	≤ 5 N																														
Vibration 55 Hz to 2000 Hz <i>affecting the</i>	<i>Scanning unit</i> : ≤ 200 m/s ² (EN 60068-2-6) <i>Housing without mounting spar</i> : ≤ 100 m/s ² (EN 60068-2-6) <i>Housing with mounting spar and cable outlet on the right</i> : ≤ 150 m/s ² , <i>or left</i> : ≤ 100 m/s ² (EN 60068-2-6)																														
Shock 11 ms	≤ 300 m/s ² (EN 60068-2-27)																														
Operating temperature	0 °C to 50 °C																														
Protection class EN 60529 ³⁾	IP53 when installed in conformity with instructions in the brochure; IP64 with sealing air (air purity class [3:4:2] as per ISO 8573-1:2010)																														
Mass	<i>Encoder</i> : 0.2 kg + 0.55 kg/m of measuring length; <i>mounting spar</i> : 0.9 kg/m																														

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³⁾ In the application, the LC must be protected from the ingress of particles.


In addition, contamination level 2 must be complied with in the micro-environment (see EN 60664-1).


HEIDENHAIN

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This Product Information document supersedes all previous editions, which thereby become invalid. The basis for ordering from HEIDENHAIN is always the Product Information document edition valid when the order is made.



Further information:

To ensure proper and intended use, comply with the specifications in the following documents:

- Brochure: *Linear Encoders for Numerically Controlled Machine Tools* 571470-xx
- Brochure *Interfaces of HEIDENHAIN Encoders* 1078628-xx
- Brochure: *Cables and Connectors* 1206109-xx
- Product overview: *Interface Electronics* 598160-xx