



# HEIDENHAIN

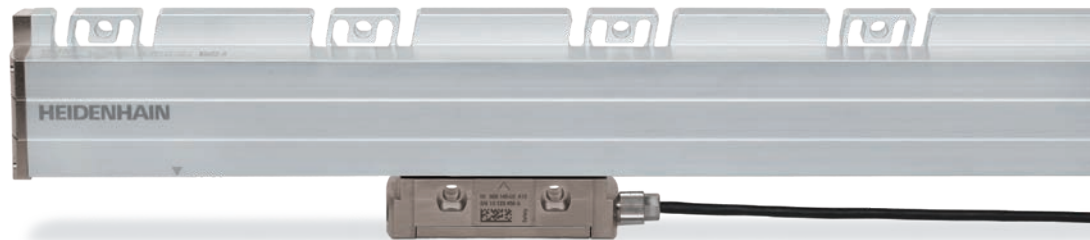


Preliminary  
Product Information

**LC 116**  
**LC 196 F**  
**LC 416**  
**LC 496 F**

Absolute Linear Encoders  
with Optimized Scanning





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

<sup>1)</sup> Connectable to Siemens interface via EIB 2391 S or EIB 2392 S

<sup>2)</sup> With cable from HEIDENHAIN: see the *Interfaces of HEIDENHAIN Encoders* brochure

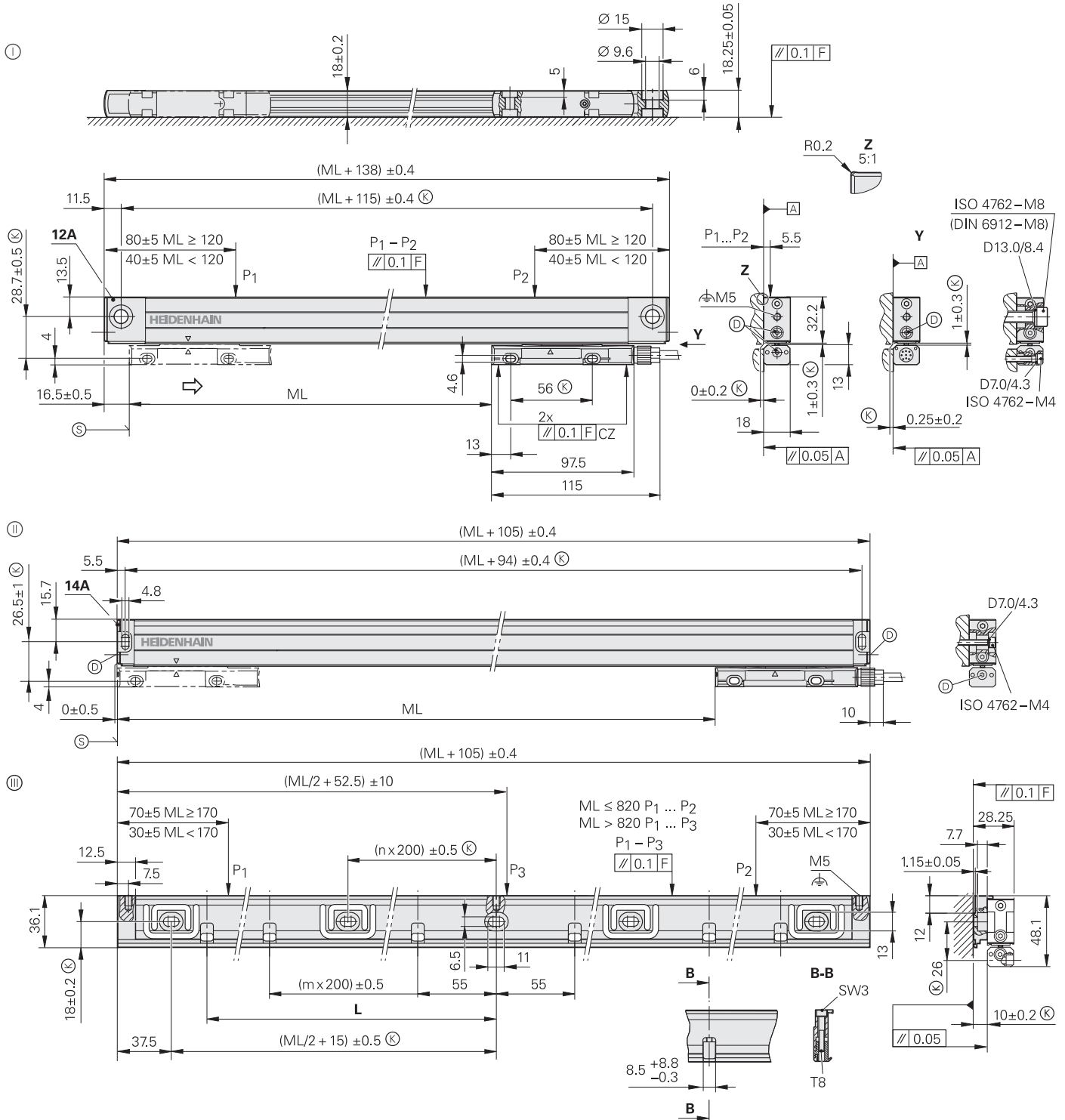
<sup>3)</sup> In the application, the LC must be protected from the ingress of particles.

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
<b>Measuring standard</b> 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 ⊕)	
<b>Accuracy grade</b>	±3 µm, ±5 µm	
<b>Measuring length (ML)*</b> in mm	Mounting spar* or clamping elements* up to ML 1240 optional; necessary for ML 1340 or greater 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	
<b>Interface</b> <sup>1)</sup>	EnDat 2.2	Fanuc Serial Interface/αi Interface
Ordering designation	EnDat22	Fanuc05
Measuring step <i>At ±3 µm</i> <i>At ±5 µm</i>	0.001 µm 0.010 µm	αi interface/α interface 0.00125 µm/0.010 µm 0.0125 µm/0.050 µm
Clock frequency (calculation time $t_{\text{cal}}$ )	≤ 16 MHz (≤ 5 µs)	–
<b>Electrical connection</b>	Separate adapter cable (1 m/3 m/6 m/9 m) connectable on mounting block	
Cable length	≤ 100 m <sup>2)</sup>	≤ 50 m
Supply voltage	DC 3.6 V to 14 V	
Power consumption (max.)	3.6 V: ≤ 1.1 W; 14 V: ≤ 1.3 W	
<b>Traversing speed</b>	≤ 180 m/min (max. acceleration in measuring direction ≤ 100 m/s <sup>2</sup> )	
<b>Required moving force</b>	≤ 5 N	
<b>Vibration</b> 55 Hz to 2000 Hz <i>affecting the</i>	<i>Scanning unit</i> : ≤ 200 m/s <sup>2</sup> (EN 60068-2-6) <i>Housing without mounting spar</i> : ≤ 100 m/s <sup>2</sup> (EN 60068-2-6) <i>Housing with mounting spar and cable outlet on the right</i> : ≤ 150 m/s <sup>2</sup> , <i>or left</i> : ≤ 100 m/s <sup>2</sup> (EN 60068-2-6)	
<b>Shock</b> 11 ms	≤ 300 m/s <sup>2</sup> (EN 60068-2-27)	
<b>Operating temperature</b>	0 °C to 50 °C	
<b>Protection class</b> EN 60529 <sup>3)</sup>	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)	
<b>Mass</b>	<i>Encoder</i> : 0.2 kg + 0.55 kg/m of measuring length; <i>mounting spar</i> : 0.9 kg/m	

\* Please select when ordering

<sup>1)</sup> Connectable to Siemens interface via EIB 2391 S or EIB 2392 S

<sup>2)</sup> With cable from HEIDENHAIN: see the *Interfaces of HEIDENHAIN Encoders* brochure

<sup>3)</sup> 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).


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# 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