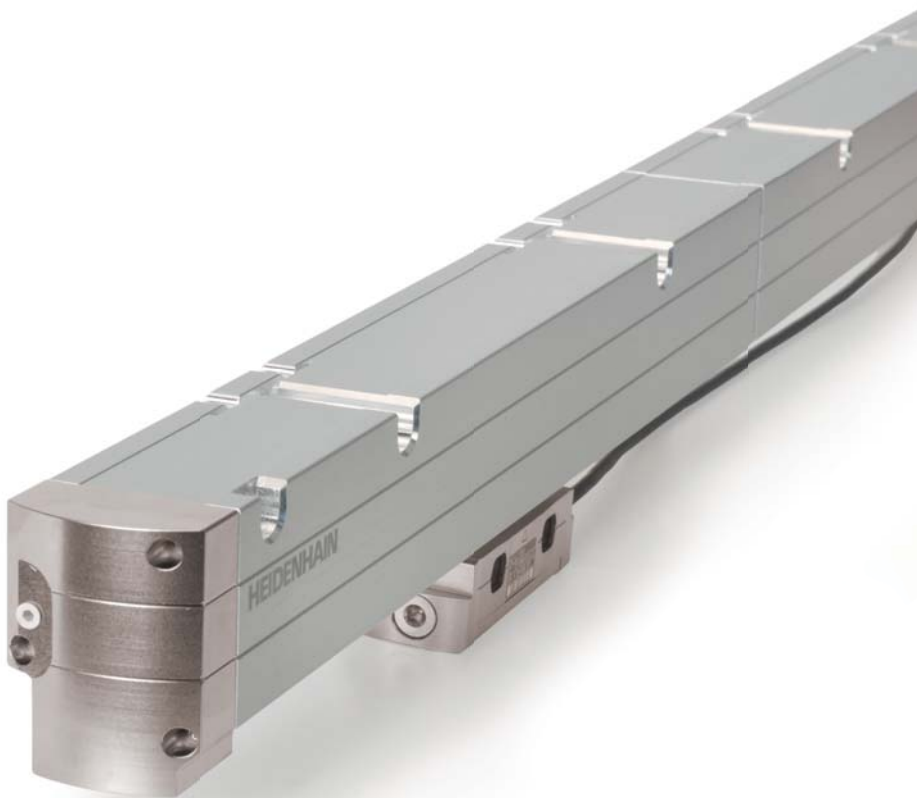




# HEIDENHAIN



Preliminary  
Product Information

## **LC 200 Series**

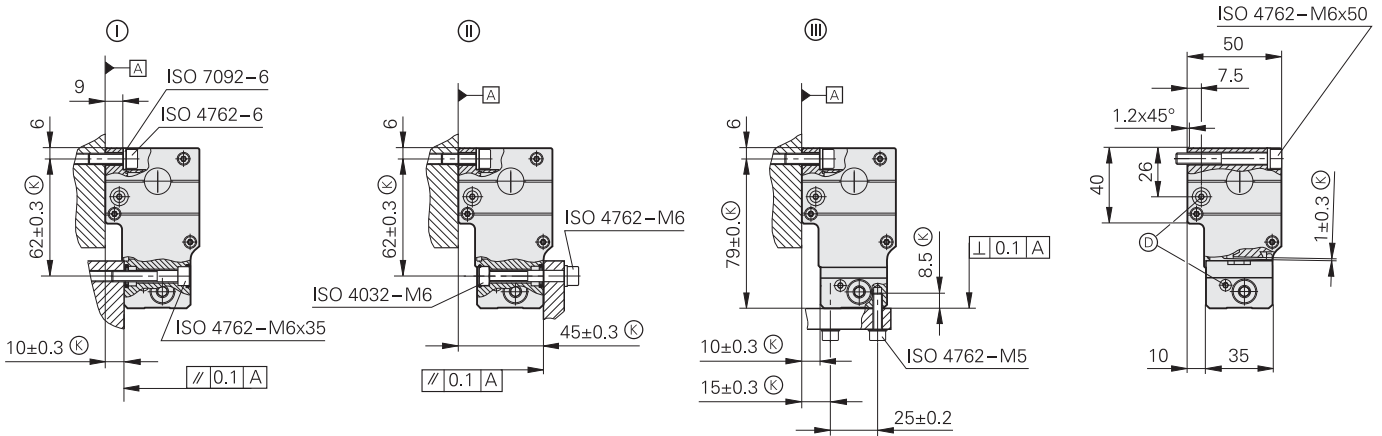
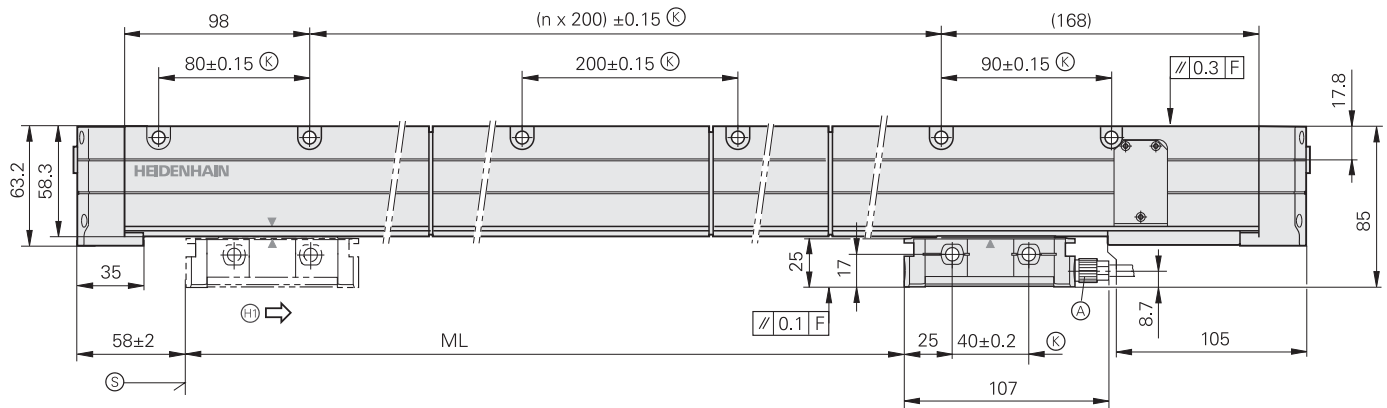
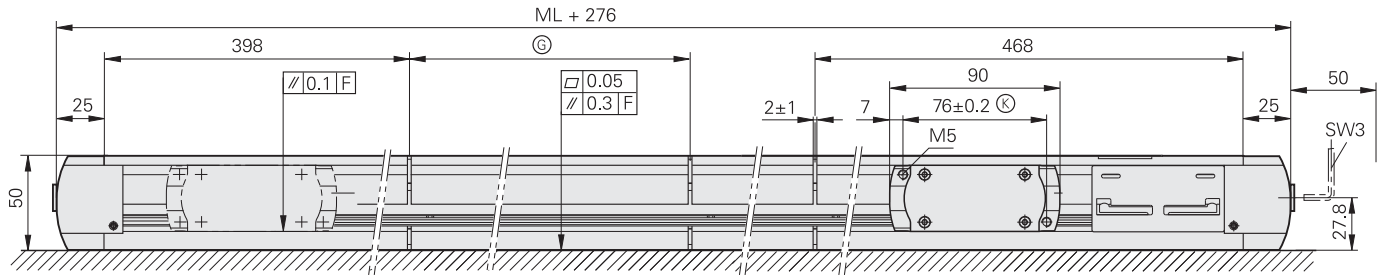
Absolute Linear Encoders for  
Large Measuring Lengths

September 2011

# LC 200 Series

Absolute linear encoders for measuring lengths up to 28 m

- 0.01 µm resolution
- Minimized interpolation error
- Simplified mounting



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

- ⓪, Ⓛ, Ⓜ = Mounting options
- F = Machine guideway
- Ⓐ = Cable connection usable at either end
- Ⓞ = Required mating dimensions
- Ⓢ = Compressed-air connection usable at either end
- Ⓟ = Beginning of measuring length ML (= 100 mm absolute)
- Ⓠ = Housing section length
- Ⓡ = Direction of scanning unit motion for output signals in accordance with interface description



Specifications	LC 211 <sup>1)</sup>	LC 281 <sup>1)</sup>
<b>Measuring standard</b> Coefficient of linear expansion	METALLUR steel scale tape with absolute track and incremental track, grating period 40 µm Same as machine base (e.g. $\alpha_{\text{therm}} \approx 10 \times 10^{-6} \text{ K}^{-1}$ for cast iron)	
<b>Accuracy grade</b>	± 5 µm	
<b>Measuring length ML*</b> in mm	4240 mm to 28040 mm in 200 mm steps Kit with single-section METALLUR steel scale tape and housing section lengths	
<b>Functional safety</b> <sup>2)</sup> For applications up to	<ul style="list-style-type: none"> <li>SIL-2 according to EN 61 508</li> <li>Category PL d according to EN ISO 13 849-1:2008</li> </ul>	–
<b>Absolute position values</b>	EnDat 2.2	
Ordering designation	EnDat 22	EnDat 02
Resolution	0.01 µm	
Clock frequency	≤ 16 MHz	≤ 2 MHz
Calculation time $t_{\text{cal}}$	≤ 5 µs	
<b>Incremental signals</b>	–	~ 1 V <sub>PP</sub>
Signal period	–	40 µm
Cutoff frequency –3 dB	–	≥ 250 kHz
<b>Electrical connection</b>	Separate adapter cable connectable at both ends of mounting block (see <i>Linear Encoders</i> catalog)	
Cable length	≤ 100 m (with HEIDENHAIN cable at clock frequency ≤ 8 MHz)	
Power supply	DC 3.6 to 14 V	
Power consumption (max.) <sup>3)</sup>	At 14 V: ≤ 1.5 W At 3.6 V: ≤ 1.1 W	
Current consumption (typical)	At 5 V: 225 mA (without load)	
<b>Traversing speed</b>	≤ 120 m/min (≤ 180 m/min upon request)	
<b>Required moving force</b>	≤ 15 N	
<b>Vibration</b> 55 to 2000 Hz <b>Shock</b> 11 ms <b>Acceleration</b>	≤ 300 m/s <sup>2</sup> (EN 60 068-2-6) ≤ 300 m/s <sup>2</sup> (EN 60 068-2-27) ≤ 100 m/s <sup>2</sup> in measuring direction	
<b>Operating temperature</b>	0 °C to 50 °C	
<b>Protection</b> EN 60529	IP 53 when installed according to mounting instructions, IP 64 with sealing air from DA 300	
<b>Weight</b>	1.3 kg + 3.6 kg/m measuring length	

\* Please select when ordering

<sup>1)</sup> Prototypes are available

<sup>2)</sup> Certification is being sought

<sup>3)</sup> See *General Electrical Information* at [www.heidenhain.de](http://www.heidenhain.de)

# Advantages of the LC 200

## Absolute up to 28 m measuring length

The LC 200 sets new standards in linear measurement on long machine-tool axes. The advantages of absolute position acquisition are now also available for measuring lengths up to 28 meters. Reference runs, which can be particularly cumbersome on long axes, become unnecessary because the absolute position value is available immediately upon switch-on.

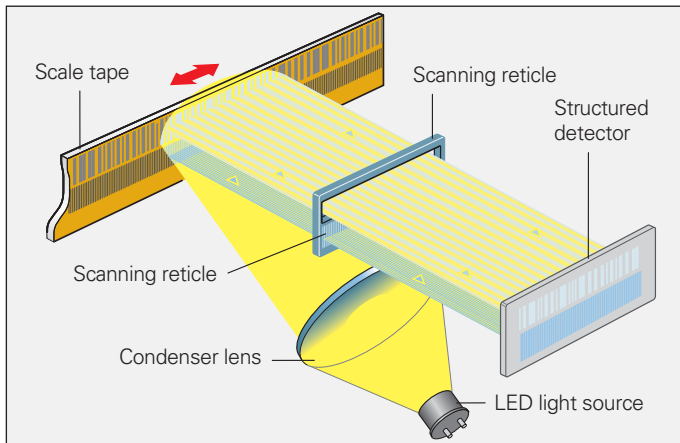
A METALLUR steel scale tape serves as measuring standard. Even with large measuring lengths, the position value is formed from only two graduation tracks. The absolute track with its serial code structure provides unique values over its entire length. The additional, incremental track is interpolated for the position value. The information from the two tracks is processed to attain a high-resolution, absolute position value.

## Highly integrated scanning

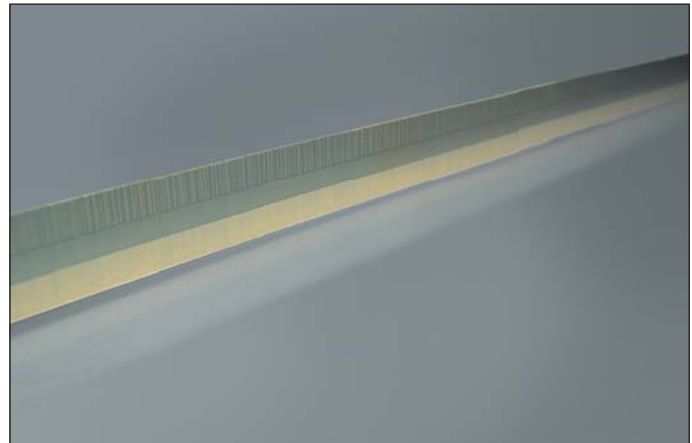
The highly integrated opto-ASIC permits scanning with high output signal quality. The opto-ASIC makes it possible to design more compact single-field scanning technology. Apart from increasing the tolerance to contamination, this allows a smaller scanning unit with increased rigidity in measuring direction. The LC 200 is therefore attractive for use for length measurement on linear motors. A further advantage is the expanded power supply of 3.6 V to 14 V.

## Simplified Mounting

Like the LB 382, the LC 200 is assembled on the machine from individual components. The housing sections feature an improved mounting and sealing technology. An integrated seal on the face and a tongue and groove system make it possible to lightly slide the housing sections together. Large mounting tolerances facilitate assembly of the entire system.



Scanning principle



METALLUR steel scale tape with absolute and incremental track

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For catalogs, brochures and product information sheets, visit

[www.heidenhain.de/docu](http://www.heidenhain.de/docu)

### Related documents

- Catalog: *Linear Encoders for Numerically Controlled Machine Tools* 571 470-xx
- Technical Information: *Safety-Related Position Encoders* 596 632-xx
- Interface Description: *EnDat* 297 403-xx
- System specification 533 095-xx