



HEIDENHAIN



Product Information

LIC 3100

Absolute Exposed
Linear Encoders



Scale	LIC 3107
Measuring standard Coefficient of linear expansion	Steel scale tape with absolute track and incremental track $\alpha_{\text{therm}} \approx 10 \cdot 10^{-6} \text{ K}^{-1}$
Accuracy grade	$\pm 15 \mu\text{m}^{1)}$
Baseline error	$\leq \pm 0.750 \mu\text{m}/50 \text{ mm}$ (typical)
Scale tape from roll*	3 m, 5 m, 10 m
Mass	Scale tape: 31 g/m Parts kit: 20 g Scale tape carrier: 68 g/m

Scanning head	LIC 311	LIC 319F	LIC 319M	LIC 319P	LIC 319Y	
Interface	EnDat 2.2	Fanuc Serial Interface αi	Mitsubishi high speed interface	Panasonic Serial Interface	Yaskawa Serial Interface	
Ordering designation*	EnDat22	Fanuc05	Mit03-4	Mit03-2	Pana02	YEC07
Measuring step	0.01 μm (10 nm)					
Calculation time t_{cal} Clock frequency	$\leq 5 \mu\text{s}$ $\leq 16 \text{ MHz}$	–				
Traversing speed²⁾	$\leq 600 \text{ m/min}$					
Interpolation error	$\pm 100 \text{ nm}$					
Electrical connection*	Cable (1 m or 3 m) with 8-pin M12 coupling (male) or 15-pin D-sub connector (male)					
Cable length (with HEIDENHAIN cable)	$\leq 100 \text{ m}$	$\leq 50 \text{ m}$	$\leq 30 \text{ m}$	$\leq 50 \text{ m}$		
Supply voltage	DC 3.6 V to 14 V					
Power consumption ²⁾ (max.)	At 3.6 V: $\leq 700 \text{ mW}$ At 14 V: $\leq 800 \text{ mW}$	At 3.6 V: $\leq 850 \text{ mW}$ At 14 V: $\leq 950 \text{ mW}$				
Current consumption (typical)	At 5 V: 75 mA (without load)	At 5 V: 95 mA (without load)				
Vibration 55 Hz to 2000 Hz Shock 6 ms	$\leq 500 \text{ m/s}^2$ (EN 60068-2-6) $\leq 1000 \text{ m/s}^2$ (EN 60068-2-27)					
Operating temperature	$-10 \text{ }^\circ\text{C}$ to $70 \text{ }^\circ\text{C}$					
Mass	Scanning head: $\leq 18 \text{ g}$ (without cable) Cable: 20 g/m Connecting element: M12 coupling: 15 g; D-sub connector: 32 g					

* Please select when ordering

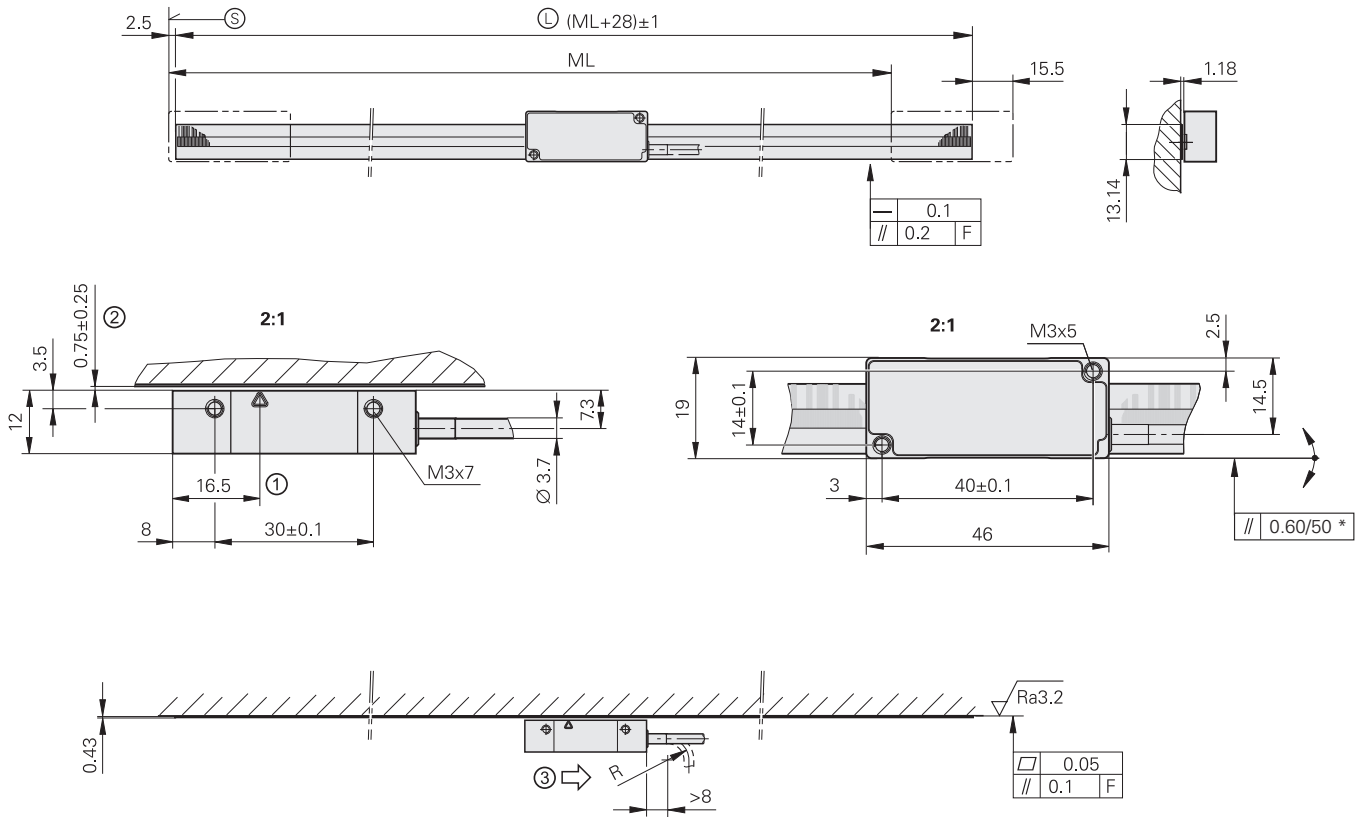
¹⁾ $\pm 5 \mu\text{m}$ after linear length-error compensation in the subsequent electronics

²⁾ See *General electrical information* in the *Interfaces of HEIDENHAIN Encoders* brochure

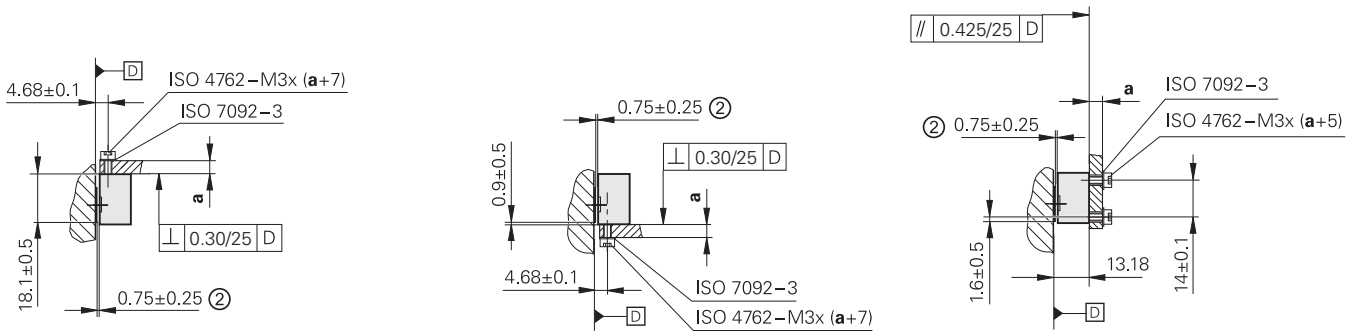
LIC 3119, LIC 3199

Absolute linear encoders for measuring lengths of up to 10 m

- For measuring steps of down to 10 nm
- Steel scale tape adhesively bonded to mounting surface
- Consisting of a linear scale and scanning head



Mounting options for scanning head



mm

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

- F = Machine guideway
- * = Mounting error plus dynamic guideway error
- ⊙ = Beginning of measuring length (ML)
- Ⓛ = Scale tape length
- 1 = Optical centerline
- 2 = Mounting clearance between scanning head and linear scale
- 3 = Direction of motion of the scanning unit for ascending position values



Scale	LIC 3109
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Scanning head	LIC 311	LIC 319F	LIC 319M	LIC 319P	LIC 319Y	
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Current consumption (typical)	At 5 V: 75 mA (without load)	At 5 V: 95 mA (without load)				
Vibration 55 Hz to 2000 Hz Shock 6 ms	$\leq 500 \text{ m/s}^2$ (EN 60068-2-6) $\leq 1000 \text{ m/s}^2$ (EN 60068-2-27)					
Operating temperature	$-10 \text{ }^\circ\text{C}$ to $70 \text{ }^\circ\text{C}$					
Mass	Scanning head	$\leq 18 \text{ g}$ (without cable)				
	Cable	20 g/m				
	Connecting element	M12 coupling: 15 g; D-sub connector: 32 g				





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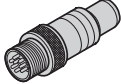


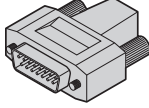
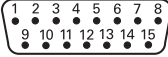



²⁾ See *General electrical information* in the *Interfaces of HEIDENHAIN Encoders* brochure

Electrical connection

EnDat connecting cables

PUR (4 × 0.14 mm ²) + (4 × 0.34 mm ²) Ø 6 mm; A _P = 0.34 mm ²		EnDat
With 8-pin M12 connector (female) and 8-pin M12 coupling (male)		368330-xx
With 8-pin M12 connector (female) and 15-pin D-sub connector (female) for an IK 220		533627-xx
With 8-pin M12 connector (female) and 15-pin D-sub connector (male) for an IK 215		524599-xx
With 8-pin M12 connector (female) and stripped cable end		634265-xx

EnDat pin layout

8-pin M12 coupling					15-pin D-sub connector			
								
	Power supply				Serial data transmission			
	8	2	5	1	3	4	7	6
	4	12	2	10	5	13	8	15
	U _P	Sensor U _P	0V	Sensor 0V	DATA	DATA	CLOCK	CLOCK
	Brown/Green	Blue	White/Green	White	Gray	Pink	Violet	Yellow

Cable shield connected to housing; **U_P** = Power supply voltage

Sensor: The sense line is connected in the encoder with the corresponding power line.

Vacant pins or wires must not be used!

Connecting cables and pin layouts for Fanuc, Mitsubishi, Panasonic, and Yaskawa can be found in the *Exposed Linear Encoders* brochure.

HEIDENHAIN

DR. JOHANNES HEIDENHAIN GmbH

Dr.-Johannes-Heidenhain-Straße 5

83301 Traunreut, Germany

☎ +49 8669 31-0

FAX +49 8669 32-5061

E-mail: info@heidenhain.de

www.heidenhain.de

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 placed.



Further information:

Comply with the requirements described in the following documents to ensure correct operation of the encoder:

- Brochure: *Exposed Linear Encoders* 208960-xx
- Brochure: *Cables and Connectors* 1206103-xx
- Brochure: *Interfaces of HEIDENHAIN Encoders* 1078628-xx
- Technical Information document: *EnDat* 383942-18