



HEIDENHAIN



Product Information

LIDA 200 Series

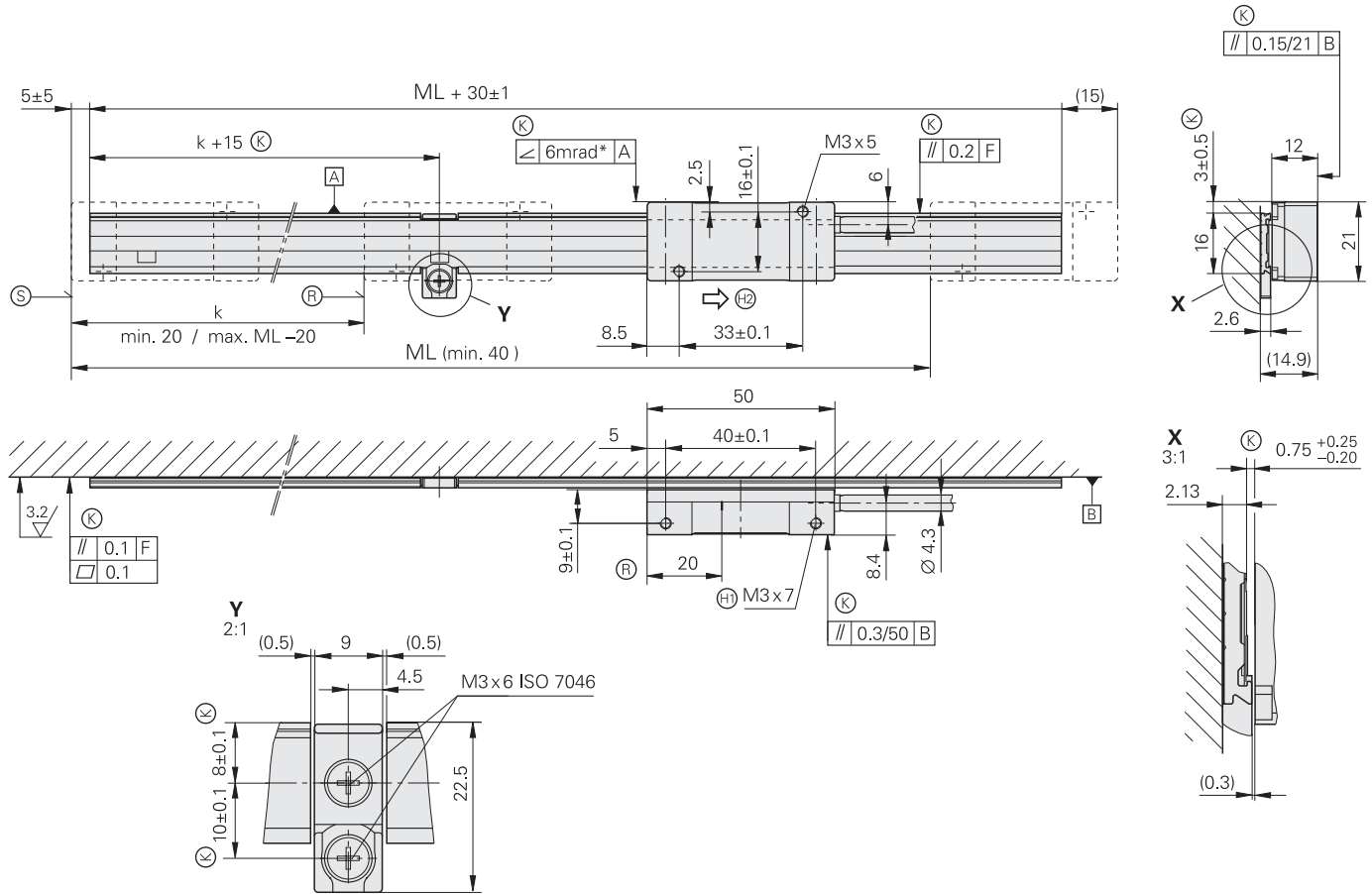
Exposed Linear Encoders with
Integrated Status Display


July 2012

LIDA 277, LIDA 287

Incremental linear encoder with large mounting tolerance

- For measuring steps to 0.5 μm
- Scale tape cut from roll
- Steel scale-tape is drawn into adhesive aluminum extrusions and fixed
- Integrated status display with three-color LED



mm

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

- * = Max. change during operation
- F = Machine guideway
- Ⓚ = Required mating dimensions
- Ⓡ = Reference mark
- Ⓛ = Scale tape length

- Ⓢ = Beginning of measuring length (ML)
- Ⓣ = Thread at both ends
- Ⓜ = Direction of scanning unit motion for output signals in accordance with interface description

Reference mark:

k = Any position of the selected reference mark starting from the beginning of the measuring length (depends on the length of cut)



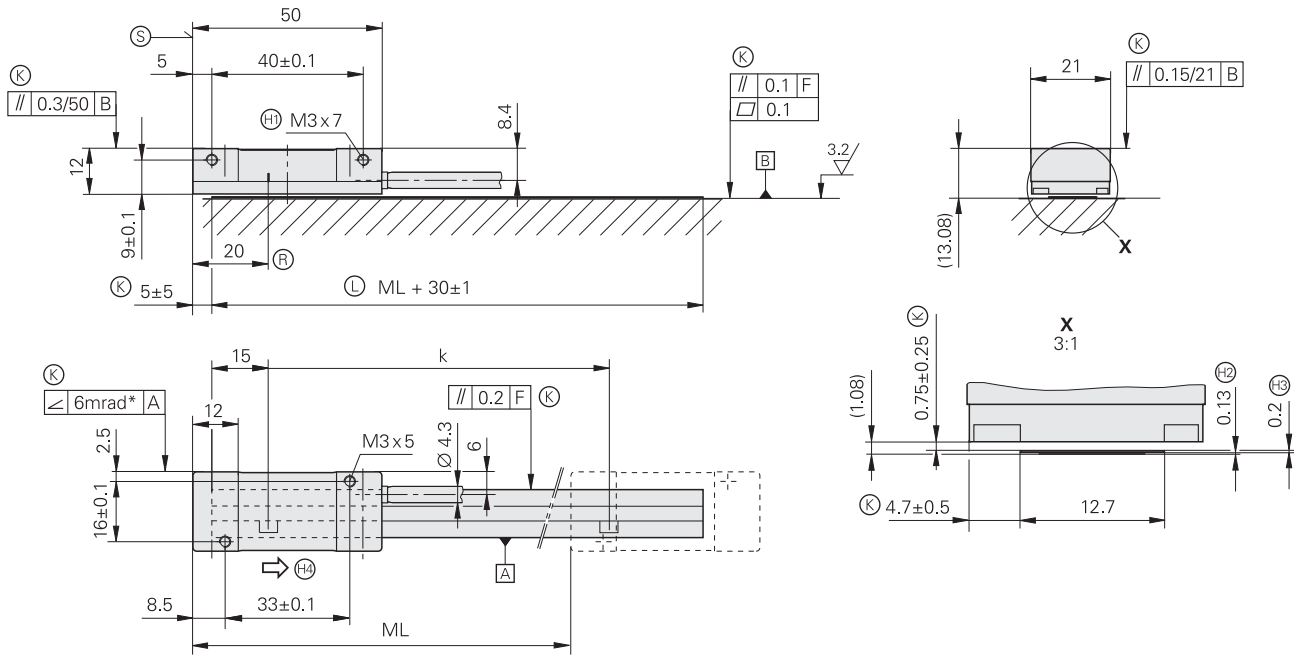
Specifications	LIDA 287	LIDA 277		
Measuring standard Coefficient of linear expansion	Steel scale tape $\alpha_{\text{therm}} \approx 10 \cdot 10^{-6} \text{ K}^{-1}$			
Accuracy grade	$\pm 30 \mu\text{m}$			
Scale tape cut from roll*	3 m, 5 m, 10 m			
Reference marks	Selectable every 100 mm			
Incremental signals	$\sim 1 \text{ V}_{\text{PP}}$	□ TTL		
Grating period	200 μm			
Integrated interpolation* Signal period	– 200 μm	10-fold 20 μm	50-fold 4 μm	100-fold 2 μm
Cutoff frequency	$\geq 50 \text{ kHz}$	–	–	–
Scanning frequency	–	$\leq 50 \text{ kHz}$	$\leq 25 \text{ kHz}$	$\leq 12.5 \text{ kHz}$
Edge separation a	–	$\geq 0.465 \mu\text{s}$	$\geq 0.175 \mu\text{s}$	$\geq 0.175 \mu\text{s}$
Integrated status display	Red/green/blue LED shows the quality of the incremental and reference mark signals			
Traversing speed	$\leq 600 \text{ m/min}$		$\leq 300 \text{ m/min}$	$\leq 150 \text{ m/min}$
Power supply Current consumption (w/o load)	5 V DC $\pm 5\%$ < 155 mA	5 V DC $\pm 5\%$ < 165 mA		
Electrical connection* Cable length	Cable 1 m or 3 m with D-sub connector (15-pin) See Interface Description, but $\leq 30 \text{ m}$ (with HEIDENHAIN cable)			
Vibration 55 Hz to 2000 Hz Shock 11 ms	$\leq 200 \text{ m/s}^2$ (EN 60068-2-6) $\leq 500 \text{ m/s}^2$ (EN 60068-2-27)			
Operating temperature	0 °C to 50 °C			
Weight	Scanning head	20 g (without connecting cable)		
	Scale tape	20 g/m		
	Scale-tape carrier	70 g/m		
	Encoder cable	30 g/m		
	Connector	32 g		

* Please select when ordering

LIDA 279, LIDA 289

Incremental linear encoder with large mounting tolerance

- For measuring steps to 0.5 μm
- Scale tape cut from roll
- Steel scale tape cemented on mounting surface
- Integrated status display with three-color LED



mm

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

- * = Max. change during operation
- F = Machine guideway
- Ⓚ = Required mating dimensions
- Ⓡ = Reference mark
- Ⓛ = Scale tape length
- Ⓢ = Beginning of measuring length (ML)

- Ⓜ = Thread at both ends
- Ⓣ = Adhesive tape
- Ⓝ = Steel scale tape
- Ⓜ = Direction of scanning unit motion for output signals in accordance with interface description

Reference mark:

k = Any position of the selected reference mark starting from the beginning of the measuring length (depends on the length of cut)



Specifications	LIDA 289	LIDA 279		
Measuring standard Coefficient of linear expansion	Steel scale tape $\alpha_{\text{therm}} \approx 10 \cdot 10^{-6} \text{ K}^{-1}$			
Accuracy grade	$\pm 30 \mu\text{m}$			
Scale tape cut from roll*	3 m, 5 m, 10 m			
Reference marks	Selectable every 100 mm			
Incremental signals	$\sim 1 V_{\text{PP}}$	TTL		
Grating period	200 μm			
Integrated interpolation* Signal period	– 200 μm	10-fold 20 μm	50-fold 4 μm	100-fold 2 μm
Cutoff frequency Scanning frequency Edge separation a	$\geq 50 \text{ kHz}$ – –	– $\leq 50 \text{ kHz}$ $\geq 0.465 \mu\text{s}$	– $\leq 25 \text{ kHz}$ $\geq 0.175 \mu\text{s}$	– $\leq 12.5 \text{ kHz}$ $\geq 0.175 \mu\text{s}$
Integrated status display	Red/green/blue LED shows the quality of the incremental and reference mark signals			
Traversing speed	$\leq 600 \text{ m/min}$		$\leq 300 \text{ m/min}$	$\leq 150 \text{ m/min}$
Power supply Current consumption (w/o load)	5 V DC $\pm 5 \%$ < 155 mA	5 V DC $\pm 5 \%$ < 165 mA		
Electrical connection* Cable length	Cable 1 m or 3 m with D-sub connector (15-pin) See Interface Description, but $\leq 30 \text{ m}$ (with HEIDENHAIN cable)			
Vibration 55 Hz to 2000 Hz Shock 11 ms	$\leq 200 \text{ m/s}^2$ (EN 60068-2-6) $\leq 500 \text{ m/s}^2$ (EN 60068-2-27)			
Operating temperature	0 °C to 50 °C			
Weight	Scanning head	20 g (without connecting cable)		
	Scale tape	20 g/m		
	Encoder cable	30 g/m		
	Connector	32 g		

* Please select when ordering

Status display

The LIDA 200 features an integrated status display with multicolor LED. This makes the mounting quality visible at a glance during mounting. No further aids are required. The status display also makes it possible to quickly and easily check the signal quality during normal operation.

The function display offers a number of benefits:

- Problem-free mounting without test unit or oscilloscope
- Quality of scanning signals displayed by three-color LED
- Continuous monitoring of incremental signals over entire measuring length
- Status of reference mark signal displayed during mounting
- Quick check of correct operation in the field without technical aids

The integrated status display permits both a qualified judgment of the incremental signals as well as a check of the reference mark signal.

The quality of the **incremental signals** is clarified by shades of color as well as the blinking of the LED. This makes a very detailed gradation of signal quality possible. The **reference mark signal's** compliance to tolerances is shown by a pass/fail display.

Note

The status display of the reference mark signal is switched off at velocities over approx. 150 mm/s in order to prevent permanent blinking. The information on the incremental signals would otherwise no longer be displayed. The reference mark signal display is not activated until the power supply is switch back on.



LED display of incremental signals

Amplitude range	LED blinks	LED color	Mounting quality
1.35 V ... 1.45 V	5x	●	Unsatisfactory
1.25 V ... 1.35 V	4x	●	
1.15 V ... 1.25 V	3x	●	Acceptable
1.05 V ... 1.15 V	2x	●	Good
0.95 V ... 1.05 V	1x	●	Optimum
0.85 V ... 0.95 V	2x	●	Good
0.75 V ... 0.85 V	3x	●	Acceptable
0.65 V ... 0.75 V	4x	●	Unsatisfactory
0.55 V ... 0.65 V	5x	●	
0.45 V ... 0.55 V	6x	●	Out of tolerance
0.35 V ... 0.45 V	7x	●	
0.25 V ... 0.35 V	8x	●	Incorrect measurement!
0.15 V ... 0.25 V	8x	●	
0.00 V ... 0.15 V	8x	●	

LED reference-mark-signal display (function check)

When the reference mark is traversed, the LED lights up briefly in blue or red.

● Out of tolerance

● Within tolerance

○ Incorrect measurement! The reference mark was scanned too quickly.

Electrical connection

Pin layout

15-pin D-sub connector														
	Power supply				Incremental signals						Other signals			
	4	12	2	10	1	9	3	11	14	7	13	8	6	15
	U_P	Sensor 5V	0V	Sensor 0V	U_{a1}	\overline{U}_{a1}	U_{a2}	\overline{U}_{a2}	U_{a0}	\overline{U}_{a0}	\overline{U}_{aS}	Vacant	Vacant	Vacant
					A+	A-	B+	B-	R+	R-	Vacant			
	Brown/ Green	Blue	White/ Green	White	Brown	Green	Gray	Pink	Red	Black	Violet	Green/ Black	Yellow/ Black	Yellow

Shield on housing; U_P = Power supply voltage

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

Vacant pins or wires must not be used.

Connecting cables

PUR connecting cable [6(2 x 0.19 mm ²)]			
PUR connecting cable [4(2 x 0.14 mm ²) + (4 x 0.5 mm ²)]		Ø 8 mm	Ø 6 mm ¹⁾
Complete with D-sub connector (female) and M23 connector (male)		331693-xx	355215-xx
With one D-sub connector (female)		332433-xx	355209-xx
Complete with D-sub connectors (female and male)		335074-xx	355186-xx
Complete with D-sub connectors (female) Pin layout for IK 220		335077-xx	349687-xx
Cable only		244957-01	291639-01
Connector on connecting cable to connector on encoder cable		For cable Ø 6 mm to Ø 8 mm	

¹⁾ Cable length for Ø 6 mm: max. 9 m

HEIDENHAIN

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For more information:

- Catalog: *Exposed Linear Encoders*