



HEIDENHAIN



Product Information

LIDA 403 Series

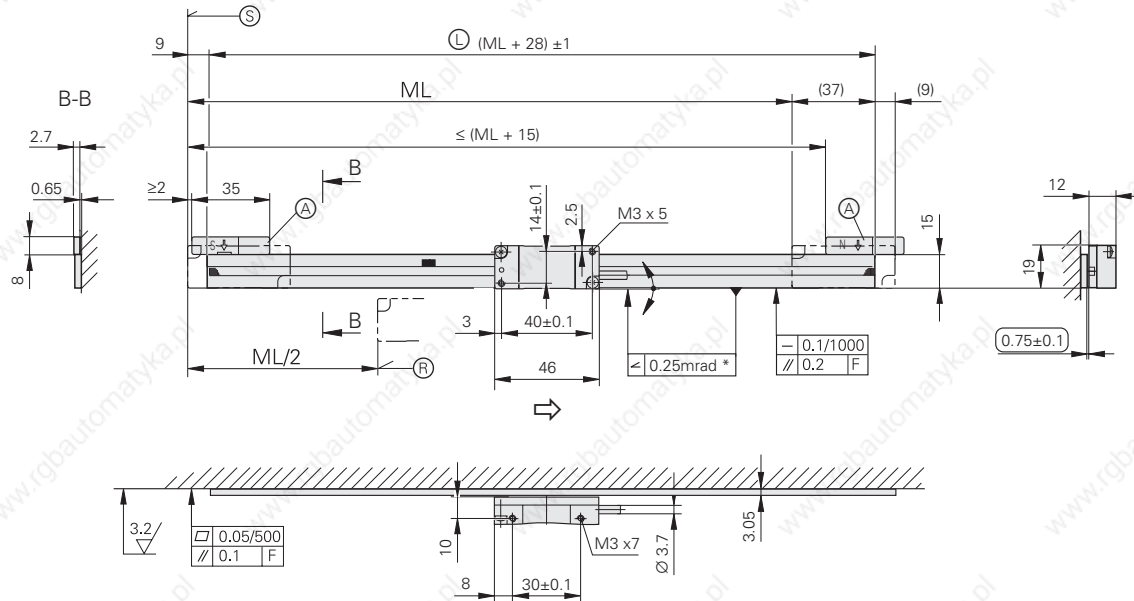
Exposed Linear Encoder

November 2006

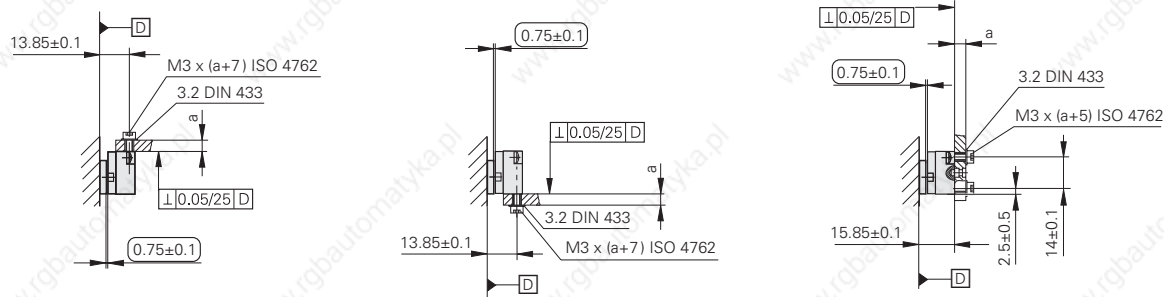
LIDA 403 Series

Incremental linear encoders with measuring standard of glass ceramic or glass

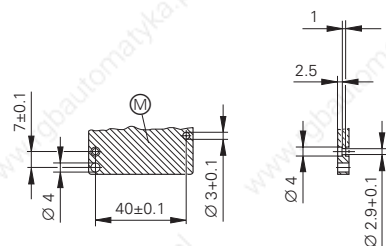
- For measuring steps of 1 μm to 0.1 μm
- Measuring standard is fastened to the mounting surface
- With LIDA 48 or LIDA 47 scanning head with limit switch



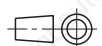
Possibilities for mounting the scanning head



Mounting surface



Dimensions in mm



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

- F = Machine guideway
- = Adjust or set
- * = Max. change during operation
- P = Gauging points for alignment
- Ⓢ = Reference mark position
- Ⓢ = Beginning of measuring length (ML)
- Ⓐ = Selector magnet for limit switch
- Ⓢ = Scale tape length
- Ⓢ = Mounting surface for scanning head
- ⇨ = Direction of scanning head motion for output signals in accordance with interface description


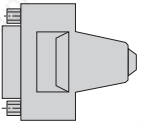





Specifications	LIDA 483	LIDA 473			
Measuring standard Expansion coefficient*	METALLUR graduation on glass ceramic or glass $\alpha_{\text{therm}} \approx 8 \times 10^{-6} \text{ K}^{-1}$ (glass) $\alpha_{\text{therm}} \approx 0 \times 10^{-6} \text{ K}^{-1}$ (Robax® glass ceramic) $\alpha_{\text{therm}} = (0 \pm 0.1) \times 10^{-6} \text{ K}^{-1}$ (Zerodur® glass ceramic)				
Accuracy grade	± 5 µm (higher accuracy grades available on request)				
Measuring length ML* in mm	240 2640	340 2840	440 3040	640 (Robax® glass ceramic up to max. ML 1640)	840 1040 1240 1440 1640 1840 2040 2240 2440
Reference marks* LIDA 4x3 LIDA 4x3C	One at midpoint of measuring length Distance-coded upon request				
Incremental signals	~ 1 V _{PP}		□TTL		
Grating period	20 µm				
Integrated interpolation* Signal period	– 20 µm	5-fold 4 µm	10-fold 2 µm	50-fold 0.4 µm	100-fold 0.2 µm
Cutoff frequency –3 dB	≥ 400 kHz		–		
Scanning frequency*	–	≤ 200 kHz ≤ 100 kHz ≤ 50 kHz	≤ 100 kHz ≤ 50 kHz ≤ 25 kHz	≤ 50 kHz ≤ 25 kHz ≤ 12.5 kHz	≤ 25 kHz ≤ 12.5 kHz ≤ 6.25 kHz
Edge separation a	–	≥ 0.23 µs ≥ 0.48 µs ≥ 0.98 µs	≥ 0.08 µs ≥ 0.18 µs ≥ 0.38 µs		
Traversing speed	480 m/min	≤ 240 m/min ≤ 120 m/min ≤ 60 m/min	≤ 120 m/min ≤ 60 m/min ≤ 30 m/min	≤ 60 m/min ≤ 30 m/min ≤ 15 m/min	≤ 30 m/min ≤ 15 m/min ≤ 7.5 m/min
Limit switches	L1/L2 with two different magnets; <i>output signals</i> : TTL (without line driver)				
Power supply without load	5 V ± 5%/ < 150 mA		5 V ± 5 %/< 200 mA		
Electrical connection	Cable 3 m with D-sub connector (15-pin), interface electronics for LIDA 473 integrated in the connector				
Cable length ¹⁾	≤ 20 m				
Vibration 55 to 2000 Hz Shock 11 ms	≤ 200 m/s ² (IEC 60068-2-6) ≤ 500 m/s ² (IEC 60068-2-27)				
Operating temperature	0 °C to 50 °C				
Weight Scanning unit Interface electronics Scale Encoder cable	20 g (without connecting cable) 140 g 3 g + 0.1 g/mm measuring length 22 g/m				

* Please indicate when ordering

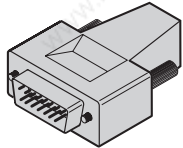
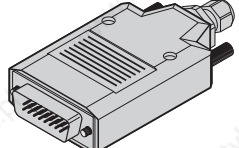









¹⁾ With HEIDENHAIN cable

Electrical Connection

Mating element on connecting cable to connector on encoder cable 	D-sub connector (female), 15-pin 
For connecting cable	Ø 8 mm Ø 6 mm 315650-14

PUR connecting cable Ø 8 mm [4(2 x 0.14 mm ²) + (4 x 0.5 mm ²) + 2 x (2 x 0.14 mm ²)] Shield on housing		
PUR connecting cable Ø 6 mm [6(2 x AWG28) + (4 x 0.14 mm ²)]	Ø 8 mm	Ø 6 mm ¹⁾
Complete with D-sub connector (female) and connector (male) 	354379-xx	355397-xx
With one D-sub connector (female) 	354411-xx	355398-xx
Cable only 	354341-01	355241-01

¹⁾ Cable length for Ø 6 mm max. 9 m

15-pin D-sub connector 	15-pin D-sub connector with integrated interface electronics 																																																																											
<table border="1"> <thead> <tr> <th></th> <th colspan="4">Power supply</th> <th colspan="6">Incremental signals</th> <th colspan="4">Other signals</th> </tr> <tr> <th></th> <th>4</th> <th>12</th> <th>2</th> <th>10</th> <th>1</th> <th>9</th> <th>3</th> <th>11</th> <th>14</th> <th>7</th> <th>13</th> <th>8</th> <th>6</th> <th>15</th> </tr> </thead> <tbody> <tr> <td>  TTL </td> <td>U_P</td> <td>Sensor 5 V</td> <td>0 V</td> <td>Sensor 0 V</td> <td>U_{a1}</td> <td>U_{a1}</td> <td>U_{a2}</td> <td>U_{a2}</td> <td>U_{a0}</td> <td>U_{a0}</td> <td>U_{aS}</td> <td>L1²⁾ H³⁾</td> <td>L2²⁾ L³⁾</td> <td>1)</td> </tr> <tr> <td>  1Vpp </td> <td colspan="2">● — ●</td> <td colspan="2">● — ●</td> <td>A+</td> <td>A-</td> <td>B+</td> <td>B-</td> <td>R+</td> <td>R-</td> <td>Vacant</td> <td></td> <td></td> <td>Vacant</td> </tr> <tr> <td>  </td> <td>Brown/ Green</td> <td>Blue</td> <td>White/ Green</td> <td>White</td> <td>Brown</td> <td>Green</td> <td>Gray</td> <td>Pink</td> <td>Red</td> <td>Black</td> <td>Violet</td> <td>Green/ Black</td> <td>Yellow/ Black</td> <td>Yellow</td> </tr> </tbody> </table>		Power supply				Incremental signals						Other signals					4	12	2	10	1	9	3	11	14	7	13	8	6	15	 TTL	U_P	Sensor 5 V	0 V	Sensor 0 V	U_{a1}	U_{a1}	U_{a2}	U_{a2}	U_{a0}	U_{a0}	U_{aS}	L1²⁾ H³⁾	L2²⁾ L³⁾	1)	 1Vpp	● — ●		● — ●		A+	A-	B+	B-	R+	R-	Vacant			Vacant		Brown/ Green	Blue	White/ Green	White	Brown	Green	Gray	Pink	Red	Black	Violet	Green/ Black	Yellow/ Black	Yellow	
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Shield on housing; **U_P** = power supply voltage

Sensor: The sensor line is connected internally with the corresponding power line

¹⁾ TTL/11 μA_{PP} conversion for PWT

²⁾ Only for LIDA 4xx

³⁾ Color assignment applies only to connecting cable

³⁾ Only for LIF 481

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For more information:

- Brochure: *Exposed Linear Encoders*

