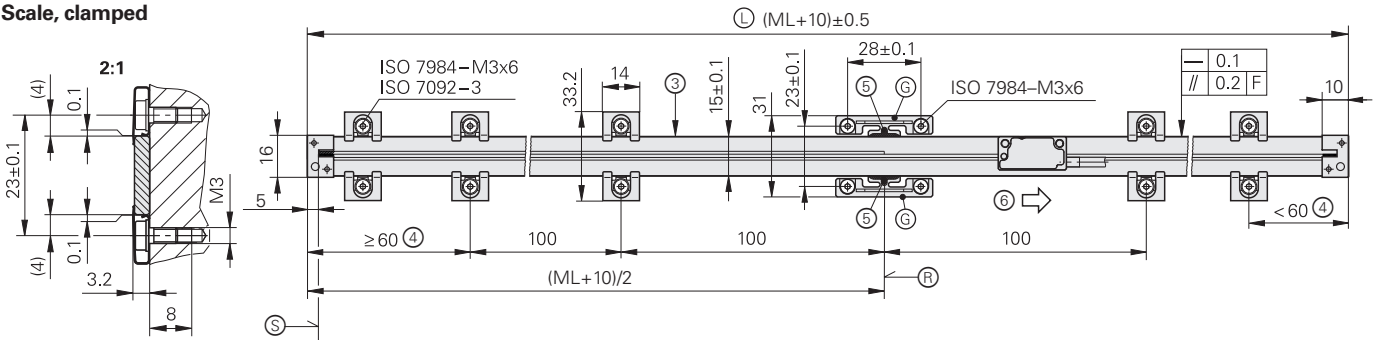


LIP 6071, LIP 6081

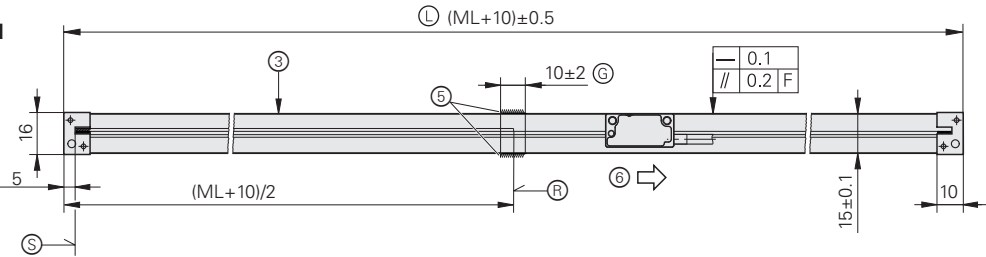
Incremental linear encoders with very high accuracy

- For limited installation space
- For measuring steps of down to 1 nm
- For high traversing speeds and long measuring lengths
- Position detection through homing track and limit switches
- Measuring standard secured with adhesive or fixing clamps

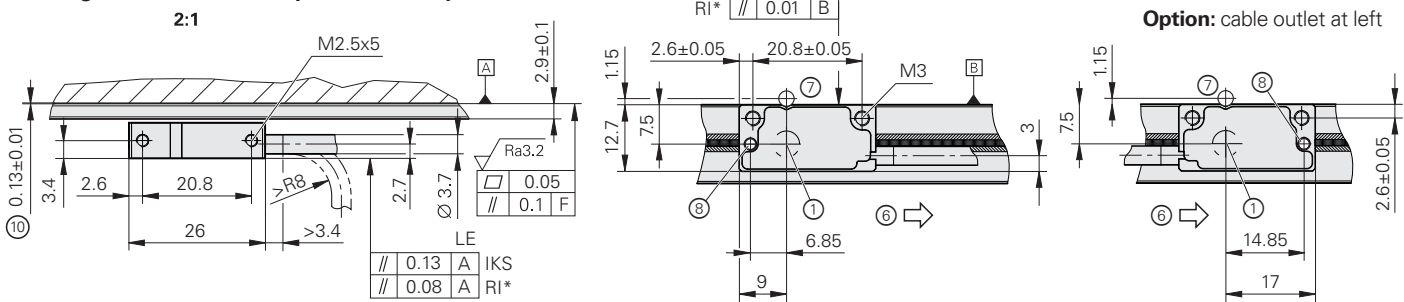
Scale, clamped



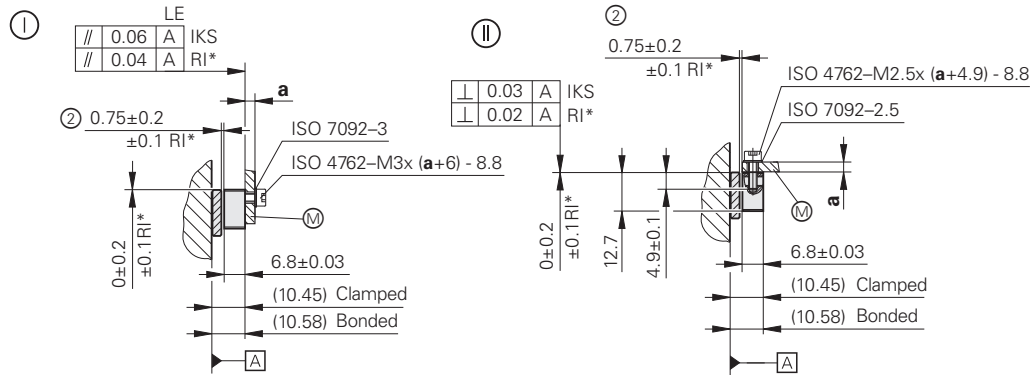
Scale, adhesively bonded



Scanning head and scale clamped / adhesively bonded



Mounting options for scanning head
(shown without fixing clamps)



F = Machine guideway

* = Maximum change during operation

IKS = Incremental track

RI = Reference mark track

Ⓜ = Mounting surface

Ⓛ = Scale length

Ⓢ = Beginning of measuring length (ML)

Ⓤ = Fixed point for defining the thermal fixed point

Ⓡ = Reference mark position

1 = Optical centerline

2 = Mounting gap between scanning head and scale; adjusted by means of a spacer shim

3 = Scale stop surface

4 = Depending on the measuring length (ML), use an additional pair of fixing clamps

5 = Adhesive

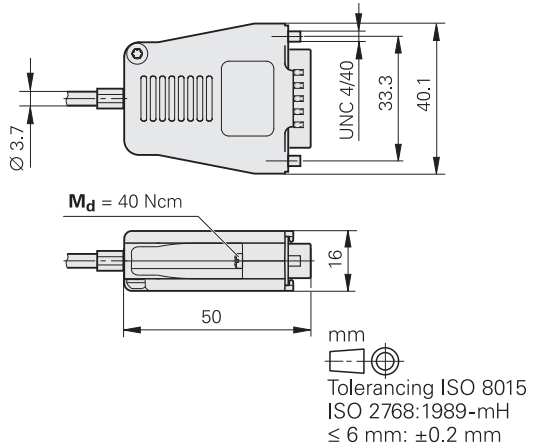
6 = Direction of motion of the scanning unit for increasing position values

7 = Moiré adjustment option 1: alignment pin, Ø 3m6, possible only with mounting option ①

8 = Moiré adjustment option 2: alignment pin Ø 2m6

9 = Recommended: Ø 3

10 = Adhesive tape (only if the scale is adhesively bonded)



Scale	LIP 6001													
Measuring standard* Coefficient of linear expansion	OPTODUR phase grating on Zerodur glass ceramic or glass; grating period: 8 µm $\alpha_{\text{therm}} = (0 \pm 0.1) \cdot 10^{-6} \text{ K}^{-1}$ (Zerodur glass ceramic); $\alpha_{\text{therm}} \approx 8 \cdot 10^{-6} \text{ K}^{-1}$ (glass)													
Accuracy grade*	±1 µm (only for Zerodur glass ceramic up to a measuring length of 1020 mm); ±3 µm													
Baseline error	≤ ±0.175 µm/5 mm													
Measuring length (ML)* in mm	20 620 1640	30 670 1840	50 720 2040	70 770 2240	120 820 2440	170 870 2640	220 920 2840	270 970 3040	320 1020	370 1140	420 1240	470 1340	520 1440	570 1540
Reference mark	One at midpoint of measuring length													
Mass	1.1 g + 0.11 g/mm of measuring length													
Scanning head	LIP 608		LIP 607											
Interface	~ 1 V _{PP}		TTL ¹⁾											
Integrated interpolation* Signal period	– 4 µm		5-fold 0.8 µm	10-fold 0.4 µm	25-fold 0.16 µm	50-fold 0.08 µm	100-fold 0.04 µm	500-fold 0.008 µm						
Cutoff frequency –3 dB	≥ 1 MHz													
Scanning frequency	–		– – ≤ 312.5 kHz	– ≤ 312.5 kHz ≤ 156.25 kHz	≤ 250 kHz ≤ 125 kHz ≤ 62.5 kHz	≤ 125 kHz ≤ 62.5 kHz ≤ 31.25 kHz	≤ 62.5 kHz ≤ 31.25 kHz ≤ 15.63 kHz	≤ 12.5 kHz ≤ 6.25 kHz ≤ 3.13 kHz						
Edge separation <i>a</i>	–		– – ≥ 0.135 µs	– ≥ 0.07 µs ≥ 0.135 µs	≥ 0.03 µs ≥ 0.07 µs ≥ 0.135 µs									
Traversing speed ²⁾	≤ 240 m/min		– – ≤ 75 m/min	– ≤ 75 m/min ≤ 37 m/min	≤ 60 m/min ≤ 30 m/min ≤ 15 m/min	≤ 30 m/min ≤ 15 m/min ≤ 7.5 m/min	≤ 15 m/min ≤ 7.5 m/min ≤ 3.7 m/min	≤ 3 m/min ≤ 1.5 m/min ≤ 0.75 m/min						
Interpolation error RMS position noise	±4 nm 0.4 nm (1 MHz ³⁾)		–											
Electrical connection*	Cable outlet on the left or right and straight or angled 1 V _{PP} : Cable (0.5 m/1 m/3 m) with 15-pin D-sub connector (male) TTL: Cable (0.5 m or 1 m) with interface electronics in the 15-pin D-sub connector (male)													
Cable length	With HEIDENHAIN cable: homing, limit: ≤ 10 m; incremental only: ≤ 20 m; during signal adjustment with the PWM 21: ≤ 3 m													
Supply voltage	DC 5 V ±0.5 V													
Current consumption	≤ 150 mA		≤ 300 mA (without load)											
Vibration 55 Hz to 2000 Hz Shock 6 ms	≤ 500 m/s ² (IEC 60068-2-6) ≤ 1000 m/s ² (IEC 60068-2-27)													
Operating temperature	–10 °C to 70 °C													
Mass	Scanning head: ≈ 5 g (without cable) Connector: AK LIP 608: ≈ 71 g; AK LIP 607: ≈ 74 g Cable: ≈ 24 g/m													

* Please select when ordering; for measuring lengths < 70 mm, the “adhesively bonded” mounting type is recommended

¹⁾ Unlocked TTLx1 possible upon request

²⁾ With TTL: maximum traversing speed during referencing: 16.8 m/min (70 kHz)

³⁾ –3dB cutoff frequency of the downstream electronics