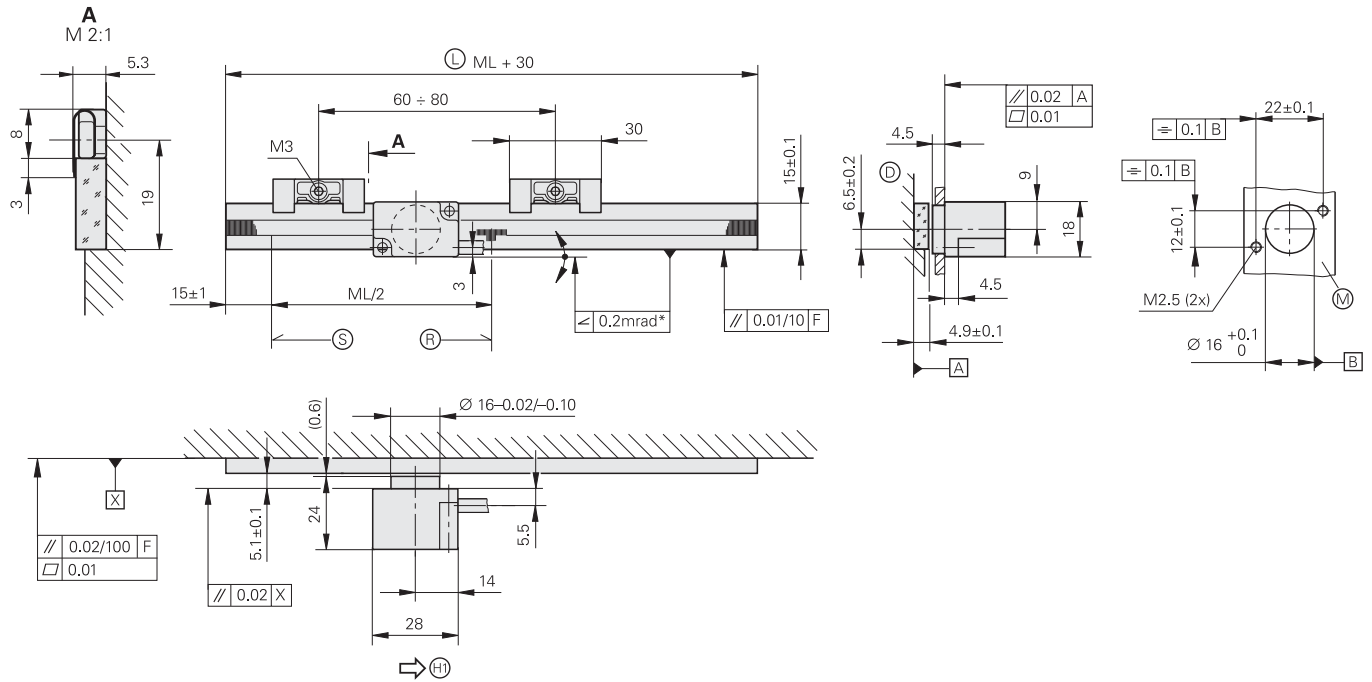


LIP 471, LIP 481

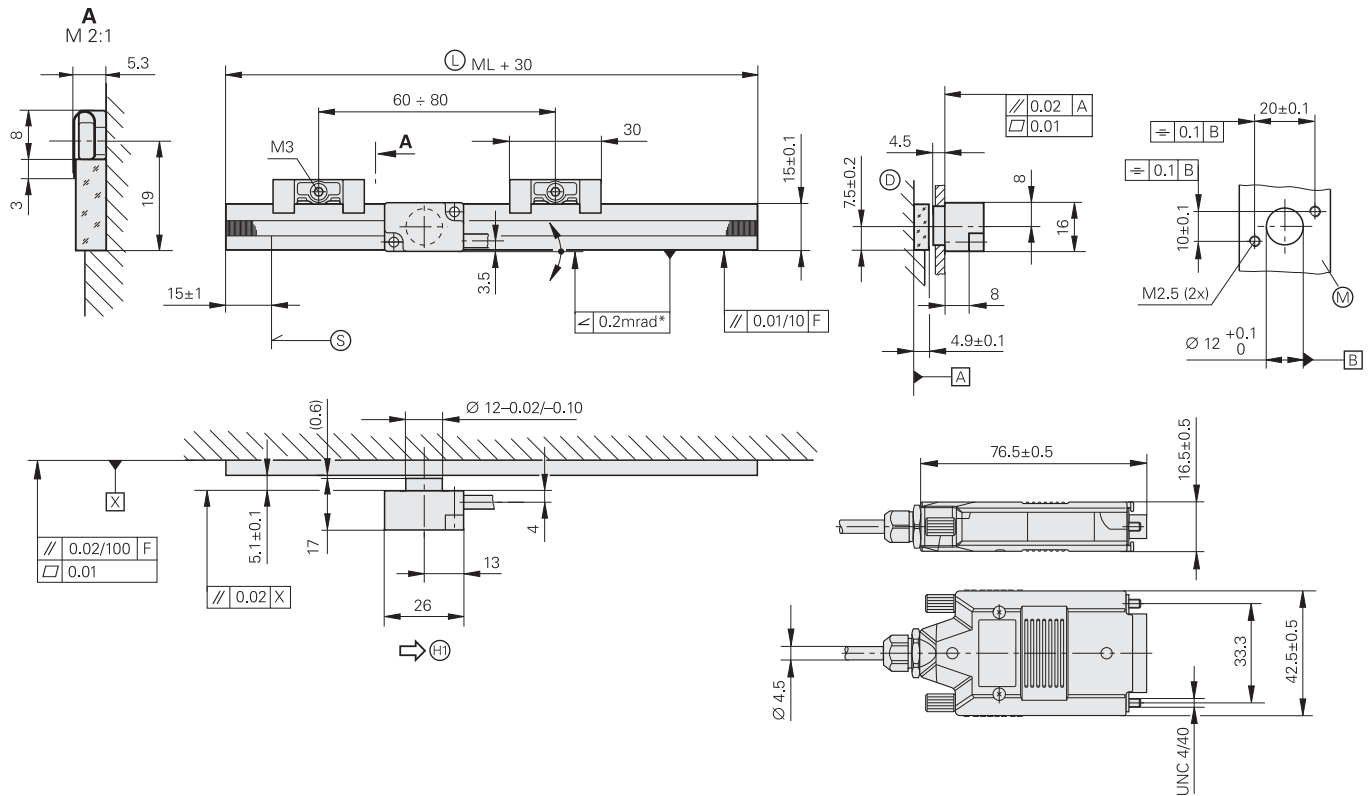
Incremental linear encoders with very high accuracy

- For limited installation space
- For measuring steps of 1 μm to 0.005 μm
- Measuring standard is fastened by fixing clamps

LIP 471 R/LIP 481 R



LIP 471 A/LIP 481 A



mm

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

- * = Max. change during operation
- F = Machine guideway
- Ⓢ = Scale length
- Ⓜ = Shown without fixing clamps
- Ⓛ = Beginning of measuring length (ML)

- Ⓜ = Reference-mark position on LIP 4x1R
- Ⓜ = Mounting surface for scanning head
- Ⓜ = Direction of scanning unit motion for output signals in accordance with interface description



Specifications	LIP 481	LIP 471						
Measuring standard* Coefficient of linear expansion	DIADUR phase grating on Zerodur glass ceramic or glass $\alpha_{\text{therm}} \approx (0 \pm 0.1) \cdot 10^{-6} \text{ K}^{-1}$ (Zerodur glass ceramic) $\alpha_{\text{therm}} \approx 8 \cdot 10^{-6} \text{ K}^{-1}$ (glass)							
Accuracy grade*	$\pm 1 \mu\text{m}$, $\pm 0.5 \mu\text{m}$ (higher accuracy grades on request)							
Measuring length ML* in mm	70	120	170	220	270	320	370	420
Reference marks* <i>LIP 4x1R</i> <i>LIP 4x1A</i>	One at midpoint of measuring length None							
Incremental signals	\sim 1 V _{pp}		\square TTL					
Grating period	4 μm							
Integrated interpolation* Signal period	– 2 μm	5-fold 0.4 μm				10-fold 0.2 μm		
Cutoff frequency –3dB	$\geq 250 \text{ kHz}$		–					
Scanning frequency* Edge separation a	–	$\leq 200 \text{ kHz}$ $\geq 0.220 \mu\text{s}$	$\leq 100 \text{ kHz}$ $\geq 0.465 \mu\text{s}$	$\leq 50 \text{ kHz}$ $\geq 0.950 \mu\text{s}$	$\leq 100 \text{ kHz}$ $\geq 0.220 \mu\text{s}$	$\leq 50 \text{ kHz}$ $\geq 0.465 \mu\text{s}$	$\leq 25 \text{ kHz}$ $\geq 0.950 \mu\text{s}$	
Traversing speed	$\leq 30 \text{ m/min}$	$\leq 24 \text{ m/min}$	$\leq 12 \text{ m/min}$	$\leq 6 \text{ m/min}$	$\leq 12 \text{ m/min}$	$\leq 6 \text{ m/min}$	$\leq 3 \text{ m/min}$	
Power supply Current consumption	DC 5 V \pm 5% < 190 mA	DC 5 V \pm 5% < 200 mA (without load)						
Electrical connection* Cable length	Cable 0.5 m, 1 m, 2 m or 3 m with D-sub connector (15-pin), interface electronics in the connector $\leq 30 \text{ m}$ (with HEIDENHAIN cable)							
Vibration 55 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 40 °C							
Weight	Scanning head	<i>LIP 4x1A</i> : 25 g, <i>LIP 4x1R</i> : 50 g (each without cable)						
	Scale	5.6 g + 0.2 g/mm measuring length						
	Connecting cable	38 g/m						
	Connector	140 g						

* Please select when ordering

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