



HEIDENHAIN



Product Information

LIP 471

LIP 481

Exposed Linear Encoders







	LIP 481	LIP 471						
Measuring standard* Coefficient of linear expansion	SUPRADUR phase grating on Zerodur glass ceramic or glass; grating period 4 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*	$\pm 1 \mu\text{m}$ (higher accuracy grades available on request) $\pm 0.5 \mu\text{m}$							
Baseline error	$\leq \pm 0.175 \mu\text{m}/5 \text{ mm}$							
Measuring length ML* in mm	70	120	170	220	270	320	370	420
Reference marks*	<i>LIP 4x1 R</i> : One at midpoint of measuring length <i>LIP 4x1 A</i> : None							
Interface	$\sim 1 \text{ V}_{\text{PP}}$	\square TTL						
Integrated interpolation* Signal period	– 2 μm	5-fold 0.4 μm			10-fold 0.2 μm			
Cutoff frequency –3 dB	$\geq 300 \text{ kHz}$	–						
Scanning frequency* Edge separation <i>a</i>	–	$\leq 200 \text{ kHz}$ $\geq 0.220 \mu\text{s}$	$\leq 100 \text{ kHz}$ $\geq 0.465 \mu\text{s}$	$\leq 50 \text{ kHz}$ $\geq 0.950 \mu\text{s}$	$\leq 100 \text{ kHz}$ $\geq 0.220 \mu\text{s}$	$\leq 50 \text{ kHz}$ $\geq 0.465 \mu\text{s}$	$\leq 25 \text{ kHz}$ $\geq 0.950 \mu\text{s}$	
Traversing speed	$\leq 36 \text{ m/min}$	$\leq 24 \text{ m/min}$	$\leq 12 \text{ m/min}$	$\leq 6 \text{ m/min}$	$\leq 12 \text{ m/min}$	$\leq 6 \text{ m/min}$	$\leq 3 \text{ m/min}$	
Interpolation error Position noise RMS	$\pm 7 \text{ nm}$ 2 nm (450 kHz) ¹⁾							
Electrical connection*	Cable 0.5 m, 1 m, 2 m, or 3 m with 15-pin D-sub connector; interface electronics in the connector							
Cable length	See the interface description in the <i>Exposed Linear Encoders</i> brochure, but $\leq 30 \text{ m}$ (with HEIDENHAIN cable)							
Power supply	DC 5 V $\pm 0.25 \text{ V}$							
Current consumption	$< 190 \text{ mA}$	$< 200 \text{ mA}$ (without load)						
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 40 °C							
Mass Scanning head Linear scale Connecting cable Connector	<i>LIP 4x1 A</i> : 25 g, <i>LIP 4x1 R</i> : 50 g (each without cable) 5.6 g + 0.2 g/mm measuring length 38 g/m 140 g							

* Please select when ordering

¹⁾ At –3 dB cutoff frequency of the subsequent electronics

Electrical connection

Pin layout

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

Vacant pins or wires must not be used!

HEIDENHAIN

DR. JOHANNES HEIDENHAIN GmbH

Dr.-Johannes-Heidenhain-Straße 5

83301 Traunreut, Germany

☎ +49 8669 31-0

☎ +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 valid when the contract is made.



Further information:

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

- Brochure: *Interfaces of HEIDENHAIN Encoders* 1078628-xx
- Brochure: *Exposed Linear Encoders* 208960-xx
- Product Information: *LIP 481V, LIP 481 U* 1037419-xx