HEIDENHAIN

Product Information

LIF 481 V

Exposed Linear Encoder for
High-Vacuum Technology

June 2008

LIF 481V

Incremental linear encoder for high-vacuum technology
- **Special, vacuum-compatible version**
- **For measuring steps of 1 µm to 0.1 µm**
- **Position detection through homing track and limit switches**

Dimensions in mm

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

Illustration without fixing clamps and cover plate

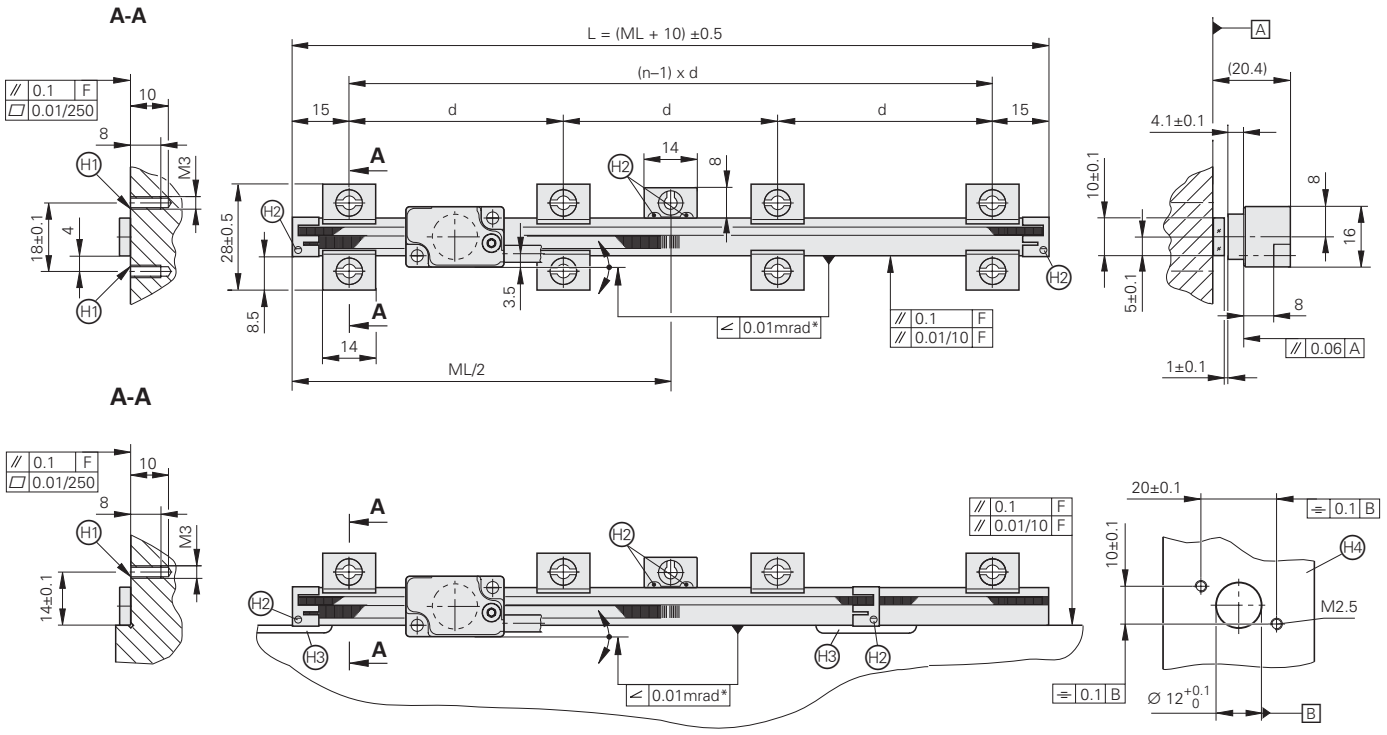
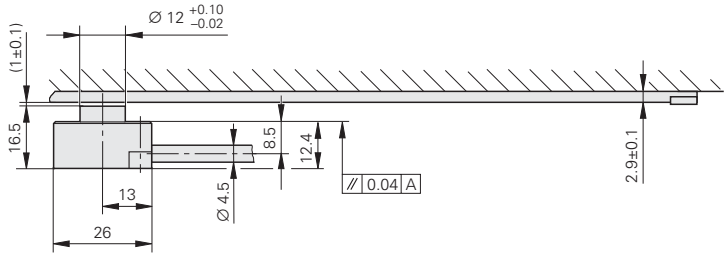


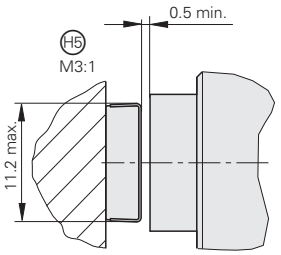
Illustration without fixing clamps and cover plate

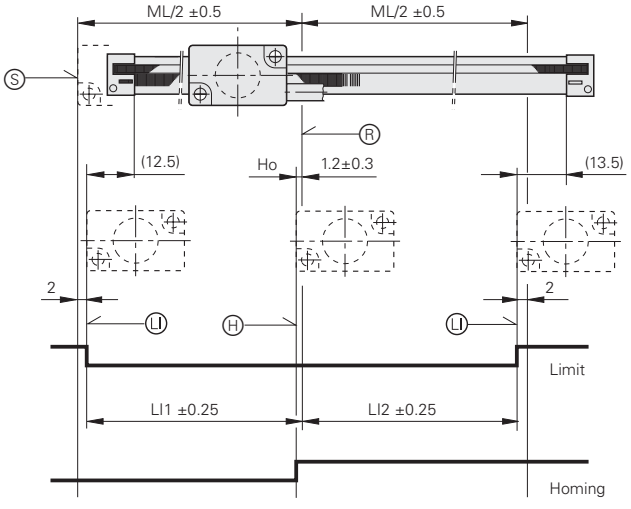
ML	n
70 < ML ≤ 170	2
170 < ML ≤ 270	3
270 < ML ≤ 370	4

$$d = \frac{ML - 20}{n - 1}$$

n = Fixing clamps (mounting with fixing clamps on both ends)







F = Machine guideway
* = Max. change during operation
ML = Measuring length
H1 = Cavity 0.5+0.2 x 45°
H2 = Vacuum adhesive, cures at room temperature in 24 hours
H3 = Opening for limit plate
H4 = Mounting surface for scanning head
H5 = Dimensions of cover plate
LI = Limit mark, adjustable
H = Switch for homing track
Ho = Trigger point for homing
R = Reference mark position
S = Beginning of measuring length

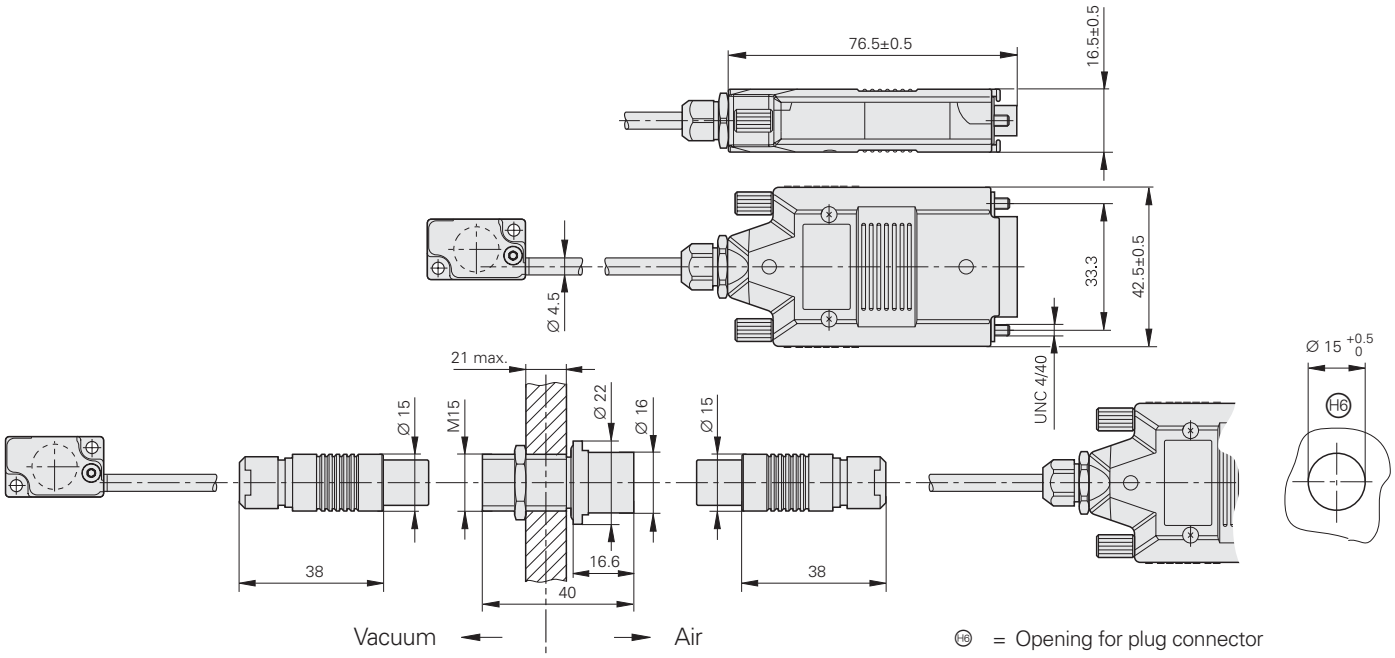
Specifications	LIF 481V
Measuring standard Graduation carrier* Expansion coefficient	SUPRADUR phase grating Glass or Zerodur® glass ceramic *Glass:* $\alpha_{therm} \approx 8 \cdot 10^{-6}\ K^{-1}$ *Zerodur® glass ceramic:* $\alpha_{therm} \approx (0 \pm 0.1) \times 10^{-6}\ K^{-1}$
Accuracy grade	± 3 µm
Measuring length ML* in mm	70 120 170 220 270 320 370 420 470 520 570 620 670 720 770 820 870 920 970 1 020
Reference marks	One at midpoint of measuring length
Output signals	⁓ 1 V_{PP}
Signal period	4 µm
Cutoff frequency –3 dB –6 dB	≥ 300 kHz ≥ 420 kHz
Traversing speed	*–3 dB:* 72 m/min *–6 dB:* 100 m/min
Position detection	Homing and limit signal
Power supply **Current consumption**	5 V ± 5 % < 175 mA
Electrical connection*	• *Interface electronics outside of the high vacuum:* Cable 0.5 m or 1 m up to high-vacuum feedthrough; cable 0.5 m up to D-sub connector (15-pin) with integrated interface electronics • *Interface electronics in high vacuum:* Cable 0.5 m or 1 m with D-sub connector (15-pin); interface electronics integrated in connector
Cable length[1)]	*Incremental:* ≤ 30 m; *homing, limit:* ≤ 10 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 40 °C
Bake-out temperature	100 °C
PCB material	FR4
Weight Scanning head Connector Scale Connecting cable	9 g (without connecting cable) 32 g; *with integrated interface electronics:* 140 g 0.8 g + 0.08 g/mm measuring length 38 g/m

***** Please select when ordering
[1)] With HEIDENHAIN cable

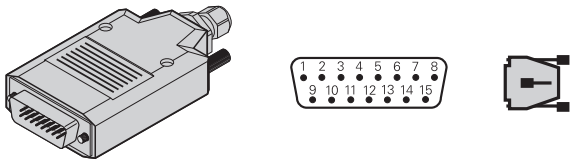
Electrical Connection

The LIF 481V is available with two different cable versions:

- **Interface electronics outside of the high vacuum:**
  The scanning head cable has a high-vacuum-compatible round connector. The items supplied include a suitable high-vacuum feedthrough and the adapter cable with 15-pin D-sub connector. The interface electronics are integrated in the D-sub connector.
- **Interface electronics in high vacuum:**
  The scanning head cable has a 15-pin D-sub connector within which the interface electronics are integrated. Available accessories are a vacuum feedthrough (15-pin D-sub connector on DN63CF flange) and an extension cable.



15-pin D-sub connector with integrated interface electronics



	Power supply				Incremental signals						Other signals		
	4	**12**	**2**	**10**	**1**	**9**	**3**	**11**	**14**	**7**	**13**	**8**	**6**
	U_P	**Sensor** 5 V	**0 V**	**Sensor** 0 V	**A+**	**A–**	**B+**	**B–**	**R+**	**R–**	**Vacant**	**H**	**L**
	Brown/ Green	Blue	White/ Green	White	Brown	Green	Gray	Pink	Red	Black	Violet	Green/ Black	Yellow/ Black

Shield on housing; **U_P** = power supply voltage
Sensor: The sensor line is connected internally with the corresponding power line

For more information
- Brochure: *Exposed Linear Encoders*
- Technical Information: *Linear Encoders for Vacuum Technology*

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