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**HEIDENHAIN**



Product Information

## **LIF 481 V**

Exposed Linear Encoder for  
High-Vacuum Technology

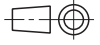
June 2008

# 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

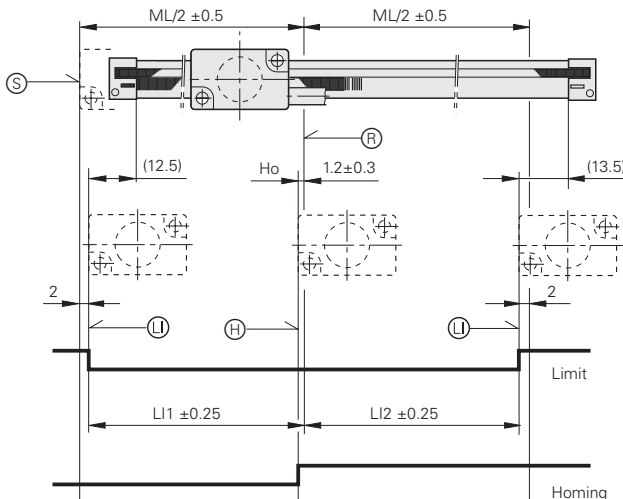
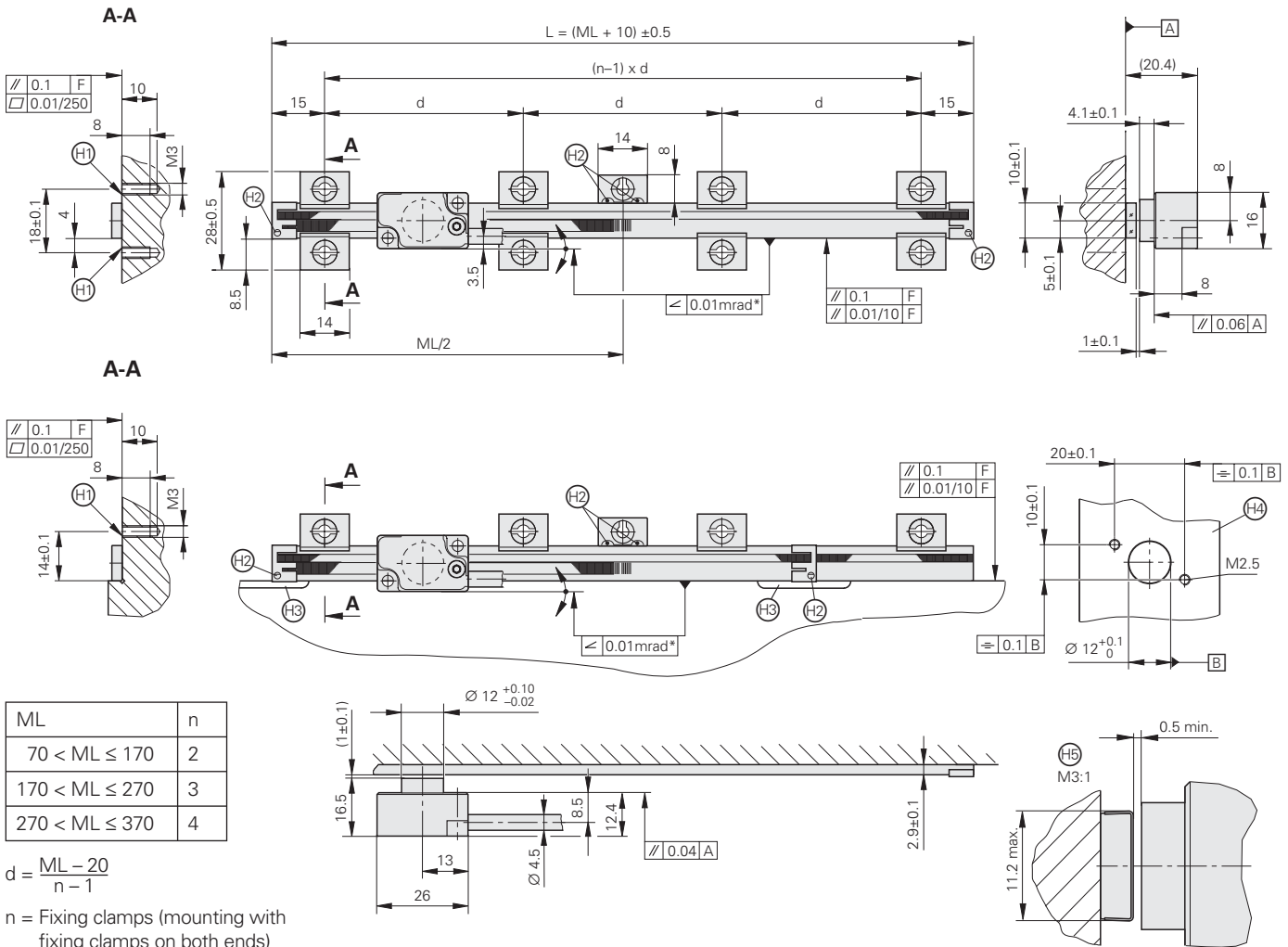
Dimensions in mm



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



- F = Machine guideway
- \* = Max. change during operation
- ML = Measuring length
- ⊙ = Cavity 0.5+0.2 × 45°
- ⊕ = Vacuum adhesive, cures at room temperature in 24 hours
- ⊗ = Opening for limit plate
- ⊕ = Mounting surface for scanning head
- ⊕ = Dimensions of cover plate
- ⊕ = Limit mark, adjustable
- ⊕ = Switch for homing track
- Ho = Trigger point for homing
- ⊕ = Reference mark position
- ⊕ = Beginning of measuring length



Specifications	LIF 481 V
<b>Measuring standard</b> Graduation carrier* Expansion coefficient	SUPRADUR phase grating Glass or Zerodur® glass ceramic Glass: $\alpha_{\text{therm}} \approx 8 \cdot 10^{-6} \text{ K}^{-1}$ Zerodur® glass ceramic: $\alpha_{\text{therm}} \approx (0 \pm 0.1) \times 10^{-6} \text{ K}^{-1}$
<b>Accuracy grade</b>	$\pm 3 \mu\text{m}$
<b>Measuring length ML*</b> in mm	70    120    170    220    270    320    370    420    470    520    570    620    670    720 770    820    870    920    970    1020
Reference marks	One at midpoint of measuring length
<b>Output signals</b>	$\sim 1 \text{ V}_{\text{PP}}$
Signal period	$4 \mu\text{m}$
Cutoff frequency    -3 dB -6 dB	$\geq 300 \text{ kHz}$ $\geq 420 \text{ kHz}$
<b>Traversing speed</b>	-3 dB: 72 m/min -6 dB: 100 m/min
<b>Position detection</b>	Homing and limit signal
<b>Power supply</b> <b>Current consumption</b>	$5 \text{ V} \pm 5 \%$ $< 175 \text{ mA}$
<b>Electrical connection*</b>	<ul style="list-style-type: none"> <li>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</li> <li>Interface electronics in high vacuum: Cable 0.5 m or 1 m with D-sub connector (15-pin); interface electronics integrated in connector</li> </ul>
Cable length <sup>1)</sup>	Incremental: $\leq 30 \text{ m}$ ; homing, limit: $\leq 10 \text{ m}$
<b>Vibration</b> 55 to 2000 Hz <b>Shock</b> 11 ms	$\leq 200 \text{ m/s}^2$ (IEC 60068-2-6) $\leq 500 \text{ m/s}^2$ (IEC 60068-2-27)
<b>Operating temperature</b>	$0 \text{ }^\circ\text{C}$ to $40 \text{ }^\circ\text{C}$
<b>Bake-out temperature</b>	$100 \text{ }^\circ\text{C}$
<b>PCB material</b>	FR4
<b>Weight</b> Scanning head Connector Scale Connecting cable	9 g (without connecting cable) 32 g; with integrated interface electronics: 140 g $0.8 \text{ g} + 0.08 \text{ g/mm}$ measuring length $38 \text{ g/m}$

\* Please select when ordering

<sup>1)</sup> With HEIDENHAIN cable

# Electrical Connection

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

- **Interface electronics outside of the high vacuum:**

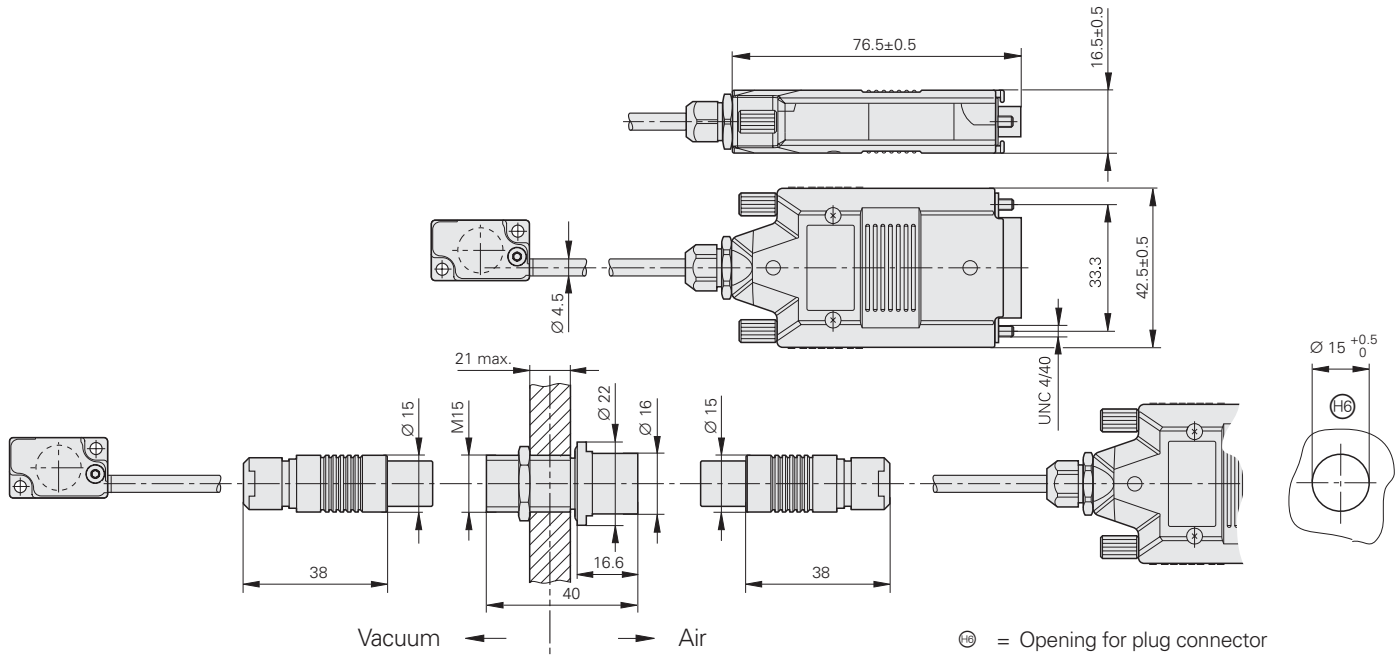
The scanning head cable has a high-vacuum-compatible round connector. The items supplied include a suitable

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 <sub>P</sub>	Sensor 5V	0V	Sensor 0V	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 <sub>P</sub> = power supply voltage												
	Sensor: The sensor line is connected internally with the corresponding power line												

## HEIDENHAIN

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### For more information

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

