



## VibroFlex Fiber

The Polytec VibroFlex laser Doppler vibrometer is a modular high-performance solution for non-contact vibration measurement. It offers unrivalled measurement performance and versatility for solving pressing vibration issues in both R&D and industrial quality control.

The VibroFlex family includes the front-end VibroFlex Connect and a selection of non-contact laser sensor heads. Integrated with the VibSoft data acquisition and analysis software, the vibration measurement system is ready to go. Study acoustics, dynamics and vibrations on nano to macro structures without contact and with laser precision.

The VibroFlex Fiber is a fiber-optic vibrometer sensor head and particularly suitable for short measurement distances and sample points difficult to access. Even almost inaccessible measurement points can be reached by using the flexible and slim optical fiber cables. In addition the VibroFlex Fiber sensor head is capable of measuring differentially, i.e. it can acquire relative movements between two sample points. The differential interferometer separates the different motion vectors already in the optical signal path and allows high-resolution measurement with inherent absolute phase stability. Thus VibroFlex Fiber extracts minute vibrations of components on heavily vibrating structures.

VibroFlex – the new flexibility of laser vibration measurement.



**!**

**Highlights**

- 10 mm diameter fiber-optic head reaches hard-to-access areas
- Differential optics measures relative motions between two locations with absolute phase stability
- Micon-sized measurement spot for tiny structures
- Also configurable for single-point vibration measurement
- Wide range of optical accessories available

**VibroFlex Fiber**  
Big insights from small spaces  
Preliminary datasheet



# Technical data



## General specifications

**Model** **VibroFlex Compact VFX-I-140**

Weight ~8 kg

Protection class IP 40

Dimensions (Laser Unit) [L x W x H] 339 x 155 x 162 (112.5)<sup>1</sup> mm (13.4 x 6.1 x 6.4 (4.4)<sup>1</sup> in)

Operating temperature 5 ... 40 °C (41 ... 104 °F)

Storage temperature -10 ... 65 °C (14 ... 149 °F)

Relative humidity max. 80%, non-condensing

Power consumption max. 15 W

Controller compatibility VibroFlex Connect

Maximum velocity ± 12 m/s

## Optical specifications

Laser type Helium Neon (HeNe)

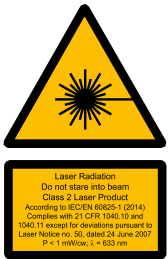
Laser class Class 2, < 1 mW, eye-safe

Laser wavelength 633 nm, visible red laser beam

Focus Manual focus

Visibility maxima <sup>2</sup>  
for differential measurement:  $\pm n \cdot 204$  mm; n = 0, 1, 2, 3 ...  
between stand-off distance of both arms  
for single-point measurement with VFX-O-130 Reference head:  
50 mm + n · 204 mm; n = 0, 1, 2, 3 ...

Total fiber lengths 2 m (optional: 3 m) for each fiber head



## Working distance and laser spot size

Fiber head		VFX-O-100 Mini Fiber Head	VFX-O-120 <sup>3</sup> Fiber Head	VFX-O-110 <sup>3</sup> Micro Spot Fiber Head
Stand-off distance	[mm]	>60 <sup>4</sup>	>80 <sup>4</sup>	55 ± 2
Exit beam diameter (1/e <sup>2</sup> )	[mm]	2.6 .. 3.5	3.3 .. 3.6	11.4
Typical spot size [µm] at working distance				
@ 55 mm		–	–	4.0
@ 60 mm		14	–	–
@ 80 mm		20	30	–
@ 100 mm		26	27	–
@ 300 mm		88	72	–
@ 500 mm		152	122	–
@ 1,000 mm		314	250	–
@ 2,000 mm		650	514	–
@ each additional meter plus		350	260	–

<sup>1</sup> Height without handle

<sup>2</sup> Measured from the shoulder of the fiber heads. Tolerance of ± 15 mm for position of visibility maximum.

<sup>3</sup> Option

<sup>4</sup> The maximum stand-off distance depends on the backscattering properties of the sample.

## Compliance with standards

Laser safety IEC/EN 60825-1

Electrical safety IEC/EN 61010-1

EMC IEC/EN 61326-1

Emission: Limit class B  
IEC/EN 61000-3-2 and 61000-3-3

Immunity: IEC/EN 61000-4-2 to 61000-4-6 and IEC/EN 61000-4-11

# Options and accessories

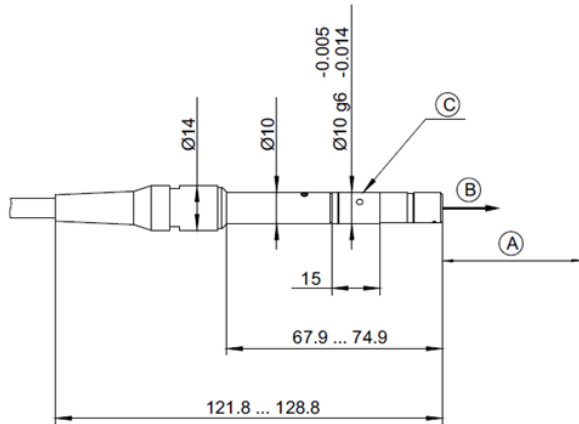
Optical accessories		
VFX-O-100 Mini Fiber Head	Small fiber head (10 mm diameter) with variable working distance (>60 mm) and a laserspot size down to 20 $\mu\text{m}$ (included)	
VFX-O-110 Micro Spot Fiber Head	Small fiber head (24 mm max. diameter) with a fixed working distance ( $56 \pm 2$ mm) and a laser spot size of 4 $\mu\text{m}$	
VFX-O-120 Micro Spot Fiber Head	Small fiber head (24 mm max. diameter) with variable focus (stand-off distance >80 mm) and a laser spot size down to 24 $\mu\text{m}$	
VFX-O-140 90° Deflection Unit (for VFX-O-100)	90° Deflection Unit for use with VFX-O-100 Mini Fiber Head with a long, thin tip (length 70 mm, diameter 5 mm) for even reaching difficult to access locations	
VFX-O-130 Reference head	Reference head allows making single-point measurements by terminating the reference fiber. The Position of the visibility maxima is fixed at $50 \text{ mm} + n \cdot 204 \text{ mm}$ ; $n = 0, 1, 2, 3 \dots$	
VFX-O-131 Reference head	Reference head allowing to flexibly adapt the optimal working distance (position of visibility maximum) for single-point measurements	
Positioning stages		
VIB-A-P35 Precision 4-Axes Stage	xz-traverse stage featuring 18 mm travel with $\pm 5^\circ$ tip/tilt function	
VIB-A-P36 Tip/Tilt Precision Stage	For positioning a single 10 mm outer diameter Mini Fiber Head. Travel range $\pm 5^\circ$	
VIB-A-CAS10 Transportation Case for VibroFlex Fiber (VFX-I-140)	Robust transportation case for the sensor head	

Polytec offers a wide range of accessories including tripods, tilt and traverse stages for mounting and positioning fiber heads.

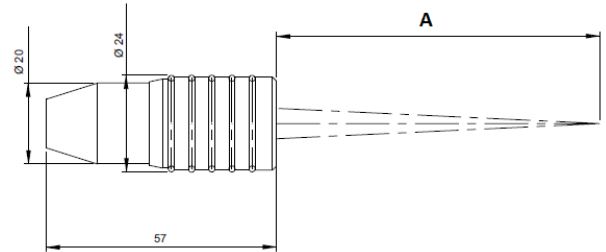
Please contact your local vibrometer sales engineer or visit our website [www.polytec.com/vibroflex](http://www.polytec.com/vibroflex) for more detailed information.

## Dimensions

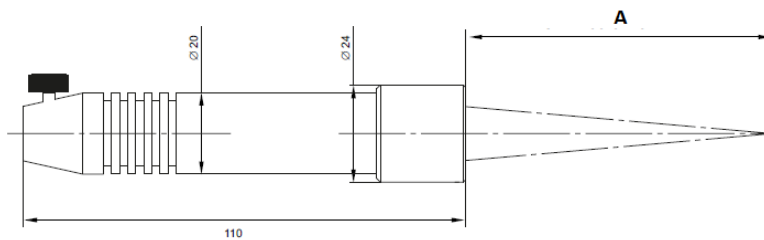
VFX-O-100 Mini Fiber Head



VFX-O-120 Fiber Head



VFX-O-110 Micro Spot Fiber Head



All dimensions in mm if not marked otherwise

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