

# Datasheet

## Fiber delivery system - kineFLEX

The kineFLEX™ is a robust laser beam delivery system for precision measurement applications. Designed around pre-focussed and integrated optical assemblies the fiber is automatically mode matched to your laser parameters to achieve transmission efficiencies greater than 60%.

Single-mode fiber enables the user to decouple the laser beam astigmatism and dynamic beam pointing instability from the measurement application. Fiber also provides a convenient packaging solution by relocating sources of heat, and by removing bulk components, thereby reducing the amount of optical surfaces in the beam path.

### kineMATIX manipulator mount

The kineFLEX fiber delivery system includes our patented kineMATIX™ fiber coupler, which is used for aligning the fiber to the laser, and for mounting the fiber to the front of the laser. The kinematic design of the laser to fiber coupler enables true ‘Plug & Play’ benefits for single-mode and polarization-preserving fiber designs, because once aligned and locked into position it remains stable.

The kineMATIX has 4-axes of adjustment with sub-micron repeatability and sub-microradian stability, to deliver 10nm positioning accuracy for the ultimate in laser-to-fiber beam alignment. The robust “set & forget” design means that single-mode fiber systems can be aligned once only and are stable for multiple remove and insert operations, thus providing true modularity for instrument designs.

### Customization

Qioptiq kineFLEX fiber systems and kineMATIX mounts can be customized to fit exacting OEM specifications.

Custom design examples include; pure Gaussian profiles, extremely low wavefront and zero aberrations, custom beam shapes and custom spatial profiles. Fiber optic designs suitable for Ultra-High Vacuum compatibility and ultra-clean environments are also offered. In the same way, the kineMATIX manipulator mount and fiber output mechanics can be customized to better suit the application. Contact us to discuss your requirements.

### Product feature highlights:

- TEM<sub>00</sub> output - diffraction limited, Gaussian, spatially filtered
- Extremely stable output beam, with world’s smallest beam wander at <1μrad/°C
- True modularity for instrument design: “Plug & Play”
- Highly repeatable performance
- High stability to opto-mechanical thermal effects with no hysteresis
- Truly co-linear beams for multiple laser lines
- Options available for various wavelength ranges and wavelength combinations
- OEM versions available (custom beam shaping, various lengths, opto-mechanics, mounts, custom inputs etc.)



## Technical specification

Fibers for	Operating Wavelengths ( $\lambda$ in nm)																				
Single- $\lambda$ laser	UV	405	445	458	473	488	515	520	532	561	594	633	637	642	660	670	730	780	830	852	
Multi- $\lambda$ laser	n/a	n/a	n/a	n/a	n/a	488 - 640										n/a	n/a	n/a	n/a	n/a	n/a
Broad-band $\lambda$ laser system	n/a	405 - 640												n/a	n/a	n/a	n/a	n/a	n/a	n/a	
	n/a	n/a	n/a	n/a	n/a	488 - 780										n/a	n/a				
Ultra-wide band $\lambda$	n/a	400 - 800																			

See kineFLEX-UV datasheet for wavelengths below 400nm

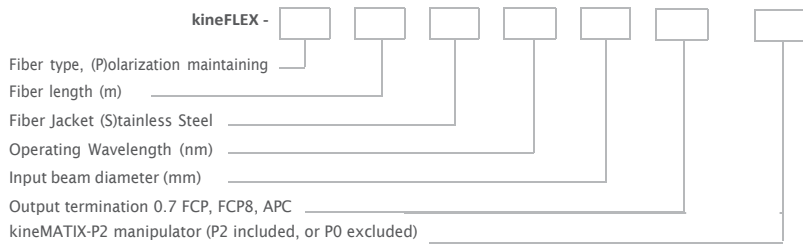
See kineFLEX-HPV datasheet for input laser powers above 100mW CW

See kineFLEX-Ultra datasheet for ultra-wide input laser wavelength range of 400-800nm

Operating performance		
Polarization ratio	$\leq -20$	dB
Throughput efficiency (assuming 0.7mm input beam diameter)	$\geq 65$ (single wavelength fibers) $\geq 60$ (multi- $\lambda$ & broadband systems)	%
Fiber parameters		
Fiber length	1 to 3	m
Fiber protective jacket	Stainless steel, 5mm OD	-
Collimated output beam		
Beam diameter	0.7	mm
M Squared	typ 1.1	-
Pointing stability	$\leq 1$	$\mu$ rad/ $^{\circ}$ C
Beam divergence	Diffraction Limited	-
Mechanical dimensions	$\varnothing 12 \times 50$	mm
Beam position	$\leq \pm 0.15$	mm
Beam angle	$\leq \pm 0.5$	mrاد
Connectorized output beam		
Polarization maintaining fiber	FCP (polarization keyed) FCP8, APC (polarization keyed and 8 degree polished)	-
Environmental conditions		
Storage temperature	10 to 50	$^{\circ}$ C
Operating pressure	Atmospheric	-
Operating temperature	10 to 40	$^{\circ}$ C
Operating humidity	Non-condensing	-

Note: OEM versions available please call

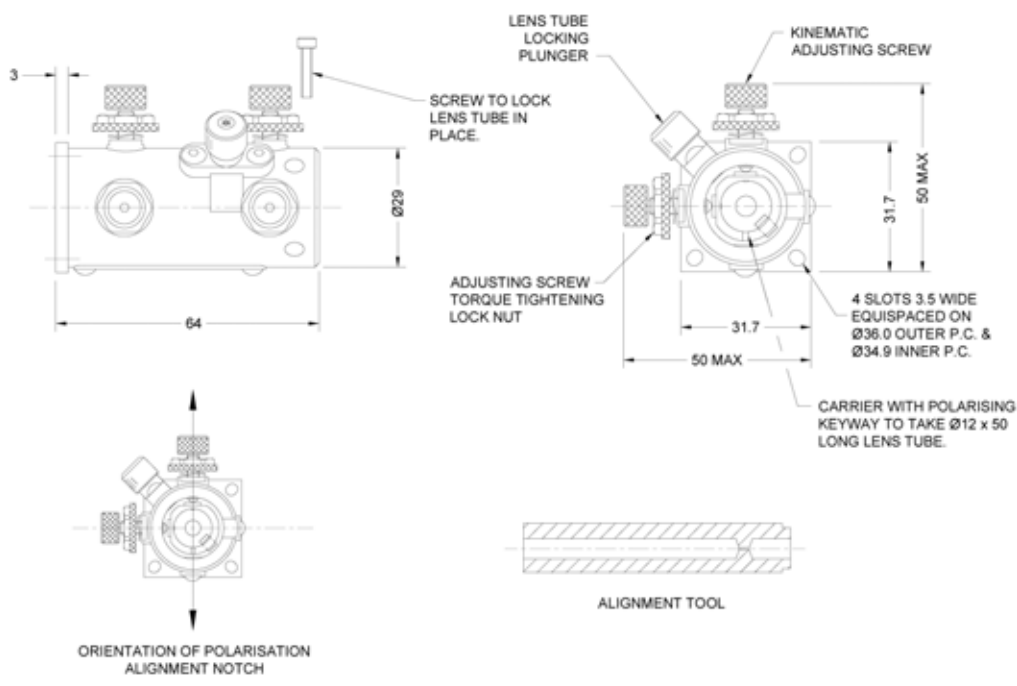
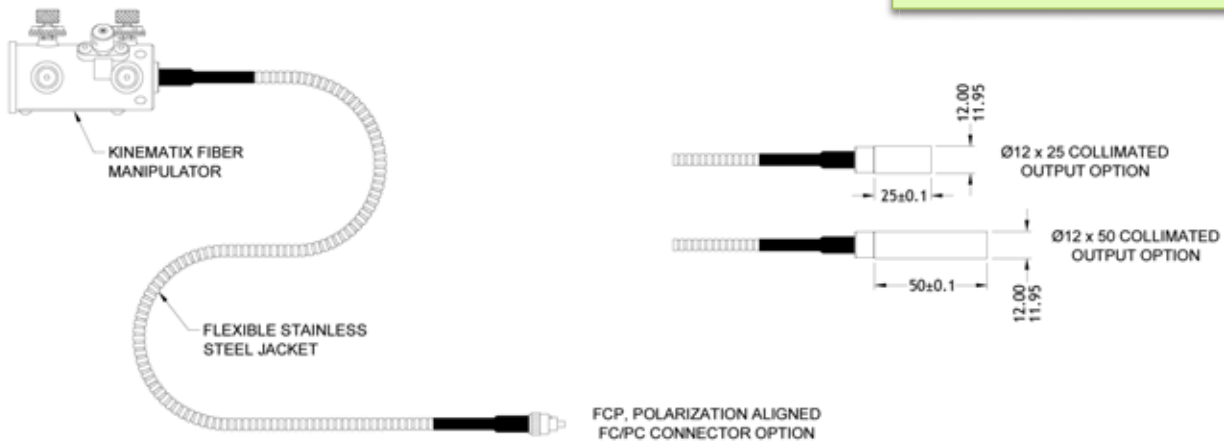
**Order code:**



**Example:**

**kineFLEX-P-2-S-488-0.7-FCP-P2**

This is a 2m length kineFLEX fiber delivery system using single-mode polarization maintaining fiber and has the standard stainless steel fiber jacket. It is designed for operation at 488nm. It expects a 0.7mm diameter collimated input laser beam and is terminated in a FCP connector output. It includes kineMATIX-P2 manipulator mount.



## Fiber Optics



### kineFLEX-HPV™ / kineFLEX-UV™

Robust high power laser beam delivery system for precision measurement applications

- Input power up to 500mW for 488nm or higher wavelengths
- Input power up to 20mW for 375nm
- OEM multi-wavelength versions



### kineFLEX-DUO™

Robust laser beam delivery system for two laser sources at visible wavelengths

- Efficient and simple beam combination
- Visible wavelengths
- Rugged platform for industrial applications



### laserPLATE™

Rapid and convenient mechanical mounting and packaging system for laser to fiber alignment

- Compatible and integrated laser to fiber coupling
- Combined laser chassis and heatsink
- Easy to integrate and align



### kineMATIX™

4-axis kinematic mount for coupling fiber to laser. Part of kineFLEX fiber system

- Compatible with all lasers
- Easy to use
- “Set & Forget” alignment lock
- “Plug & Play” performance
- OEM options with kineFLEX system

## Lasers



### iFLEX2000™

Extremely reliable and robust fiber coupled laser designed for volume manufacturing

- UV, Visible and NIR Wavelengths
- Integrated drive and temperature control electronics
- Modular single-mode fiber output



### iFLEX-iRIS™

Compact laser system with optional fiber output designed for volume manufacturing

- UV, VIS and NIR Wavelengths
- Integrated smart control and temperature control electronics
- Exceptional brightness, stability and long-term reliability
- Detachable single-mode fiber output



### iFLEX-Adder™

5 into 1 fiber-coupled beam combination system

- True ‘Plug & Play’ capability for ultimate flexibility of laser suite
- Upgradeable from 2 to 5 wavelengths as required
- Compatible with kineFLEX™ and kineFLEX-HPV™

## Multi-Wavelength Laser Engines



### iFLEX-Viper™

The world’s first integrated multi-laser engine

- Combines up to 5 lines in 1 system
- Co-linear combined beam delivered via single-mode fiber optic output
- Modulation up to 1MHz, all lines
- Upgradeable from 3 to 5 lines

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