

CEFL-KILO SERIES

CONTINUOUS WAVE ERBIUM FIBER LASER



KEY FEATURES

- Narrow linewidth
- Single longitudinal mode
- Operating wavelength from 1545 to 1565 nm
- Output power up to 15 W
- Ultra low phase noise and RIN
- Excellent SMSR
- Wavelength tunability (optional)
- Laser frequency modulation (optional)
- Diffraction limited output
- Random or linear polarization
- Maintenance free

Description

With its unequaled narrow spectral linewidth (down to 1 kHz), Keopsys CEFL-KILO series lasers are especially designed for applications which required a high precision such as LIDAR, atomic spectroscopy, atomic cooling...

CEFL-KILO series, are Erbium fiber doped lasers with low phase noise and low relative intensity noise. The system integrates an ultra low noise and narrow linewidth seed laser which is then amplified through our erbium fiber doped amplifier up to 15 W. These CW lasers come with linear or random polarization.

For application where the central emission line is critical, the CEFL-KILO offers the possibility to modulate it and to adjust the wavelength by changing the temperature.

The CEFL-KILO benefits from Keopsys VSP technology: reliability, robustness and maintenance free.

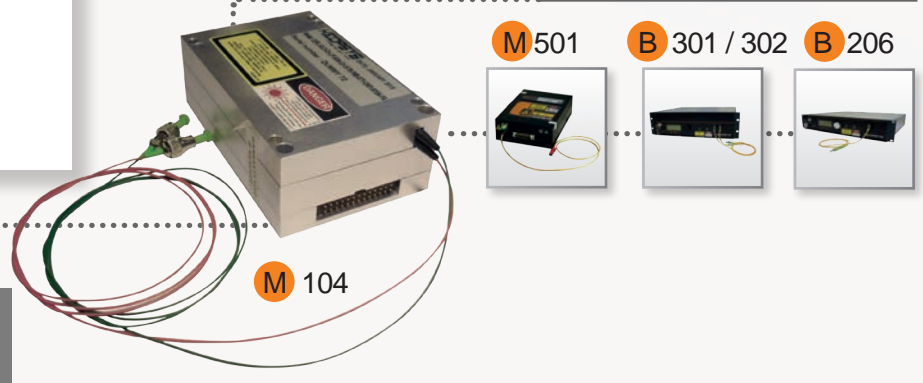
The CEFL-KILO series are available in benchtop for front face control or PC monitoring (RS232) with our B2V2 program, or in module for an easily integration.

APPLICATIONS



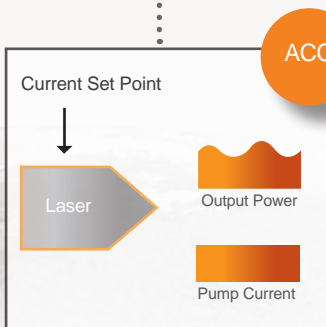
- LIDAR
- Acoustic or seismic sensing
- Atomic cooling, atomic spectroscopy
- Optical tweezing

5 Platforms

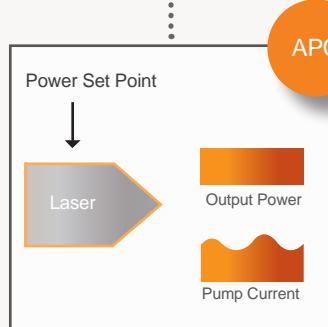


Modes of operation

The devices offer several modes of operation :



ACC (Automatic Current Control) mode is standard for all devices. The laser is controlled from diodes current set point.



APC (Automatic Power Control) mode allows to control the laser at a fixed output power set point. The device maintains a constant optical output power monitored with a photodiode. The current is adjusted automatically.

CEFL-KILO SERIES

1.5 μm SPARK FIBER LASERS FOR REMOTE SENSING

Optical Specifications @ 25 °C

	CEFL-KILO
Mode of operation	CW
Output power	From 1 to 15 W
Standard operating wavelength	1555 +/-10 nm
Wavelength stability over 1 hour, +/- 1 °C	+/- 0.5 pm for grades 1 to 5
Wavelength thermal tuning range (option WT)	> 30 pm for grades 1 to 4, 1000 pm for grade 5
Laser frequency modulation range (option FM)	100 to 200 MHz (at 10 kHz, input analog voltage -4 V to +4 V) for grades 1 to 4
2 GHz (at 500 Hz, input analog voltage 0 to 200 V) for grade 5	+/- 0.5 dB typ., +/-0.75 dB max
Laser frequency modulation bandwidth	DC to 100 kHz (input analog voltage -4 to +4 V) for grades 1 to 4
DC to 20 kHz (input voltage 0 to 200 V) for grade 5	Yes
Spectral linewidth	3, 5, 15 and 50 KHz (measured at -20 dBm and fitted with a Lorentzian model)
Polarization	Random (RP) or linear (LP, 17 dB PER)
Seed Tap (option ST)	1 m long fiber for benchtop and mating sleeve for module (FC/APC), SMF for RP, PANDA for LP
Output monitor and APC (option OM)	Internal photodiode and automatic power control mode
Fiber type	1 m long fiber, SMF/PANDA
Beam quality, M ²	< 1.1
Output termination	FC/APC, E2PS or Collimator

The CEFL-KILO series laser are available as benchtop or as OEM module (up to 2 W)

RELIABILITY

The Keopsys range of fiber lasers are manufactured with tested components and are submitted to several inspections during the manufacturing process under a rigorous quality management certified in accordance with the ISO 9001:2008 standard. Our all-in-fiber systems offer maintenance free operation. Countless units are continuously running in demanding environments with no failure.

GUARANTEE

Our fiber systems are under 1 full year parts and labor guarantee. We offer a warranty extension of 1 or 2 years. Please contact us.

CEFL-KILO SERIES

1.5 µm SPARK FIBER LASERS FOR REMOTE SENSING

Optical Specifications@ 25 °C	KILAS01	KILAS02	KILAS05	KILAS10	KILAS15
Mode of operation	CW				
Output power	1 W	2 W	5 W	10 W	15 W
Standard operating wavelength	1555 +/-10 nm				
Wavelength stability over 1 hour, +/- 1 °C	+/- 0.5 pm for grades 1 to 6				
Wavelength thermal tuning range ^(option WT)	> 30 pm for grades 1 to 4 & 6, 1000 pm for grade 5				
Laser frequency modulation range ¹ (option FM)	100 to 200 MHz (at 10 kHz, input analog voltage -4 V to +4 V) for grades 1 to 4 & 6 2GHz (at 500Hz, input analog voltage 0 to 200V) for grade 5				
Laser frequency modulation bandwidth	DC to 100kHz (input analog voltage -4 to +4V) for grades 1 to 4 & 6 DC to 20 kHz (input voltage 0 to 200 V) for grade 5				
Spectral linewidth ² & phase noise	Grade 1: 15 kHz & 123 µrad/rt-Hz @ 10 Hz, 22 µrad/rt-Hz @ 200 Hz				
	Grade 3: 5 kHz & 41 µrad/rt-Hz @ 10 Hz, 8 µrad/rt-Hz @ 200 Hz				
	Grade 4: 3 kHz & 20 µrad/rt-Hz @ 10 Hz, 4 µrad/rt-Hz @ 200 Hz				
	Grade 5: 50 kHz & 95 µrad/rt-Hz @ 10 Hz, 100 µrad/rt-Hz @ 500 MHz				
	Grade 6: 1 kHz & 10 µrad/rt-Hz @ 10 Hz, 2 µrad/rt-Hz @ 200 Hz				
Relative intensity noise (Platform M104, for grade 1)	<-145 dB/Hz, F > 50 MHz		-		
Relative intensity noise (Platform M501, for grade 1 to 4 & 6)	<-110 dB/Hz, F > 100 Hz		-		
	<-125 dB/Hz, F > 10 kHz		-		
	Shot noise limited from 400 kHz to 50 MHz		-		
Relative intensity noise (Platform B206, B301, B302, for grade 1 to 4 & 6)	<-140 dB/Hz, F > 1 MHz		<-135 dB/Hz, F > 1 MHz		
Relative intensity noise (Platform B206, B301, B302, for grade 5)	<-120 dB/Hz @ 3 MHz, shot noise limited F > 5 MHz				
Power stability (rms) over 1 hour	<1 %		<2 %		
Optical S/N ratio	>55 dB (+/-1nm from central wavelength, 0.07 nm resolution)				
Polarization	Random (RP) or linear (LP, 17dB PER)				
Seed Tap (option ST)	1 m long fiber for benchtop and mating sleeve for module (FC/APC), SMF for RP, PANDA for LP				
Output monitor and APC (option OM)	Internal photodiode and automatic power control mode				
Fiber type	1 m long fiber, SMF/PANDA				
Beam quality, M ²	< 1.1				
Output termination	FC/APC, E2PS or Collimator				
Associated platform	M104, M501 or B206	B206 or M501	B301	B302	

Platform Specifications	B206	B301/B302	M104	M501
Voltage	84 to 264 VAC (47 to 63 Hz)		22 to 32 VDC	11.5 to 12.5 VDC
Control Interface	Front panel and RS232		RS485	RS232
External laser frequency modulation	Analog voltage on rear panel		Analog voltage on Pin9 of HE10	Analog voltage on Pin17 of DB25
Warm-up time	<15 min		< 5 min	<5 min
Dimensions	448x446x88 mm, 2U	448x446x133 mm, 3U	110x70x38 mm	200x140x55 mm with heatsink
Weight	< 15 kg	< 20 kg	0.4 kg	<1.5 kg
Operating case temperature / storage temperature	+15 °C to +35 °C / -20 °C to +55 °C		-10 °C to +70 °C / -40 °C to +85 °C	

¹ External piezzo driver required for grade 5

² Measured at -20 dB and fitted with Lorentzian model

