

# LightWire FFS series

Compact  
Fiber Seeders for  
Femtosecond Lasers



## FEATURES

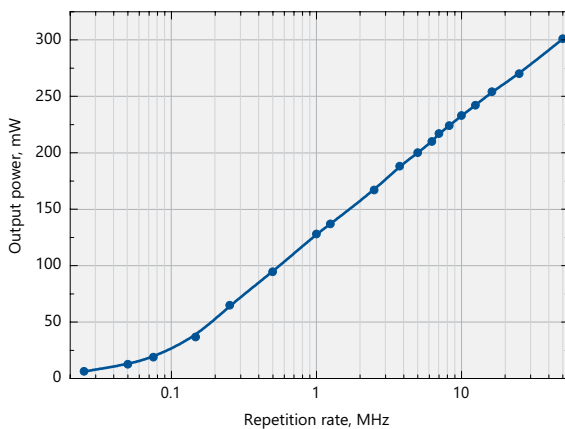
- ▶ Pulse energy > **250 nJ** at repetition rate < 200 kHz (for FFS200CHI)
- ▶ Compressed or chirped broadband pulses
- ▶ Pulses compressible down to < **200 fs** (for FFS100CHI) and < **250 fs** (for FFS200CHI)
- ▶ Pulse duration < **140 fs** (for FFS200)
- ▶ PLL option (please inquire sales@ekspla.com)
- ▶ Other wavelengths available on request

LightWire FFS series fiber lasers are dedicated for seeding solid state femtosecond Yb:YAG, Yb:KGW, Yb:CALGO based CPA systems. Ekspla offers FFS lasers either with femtosecond pulse duration directly from fiber, or with chirped pulses.

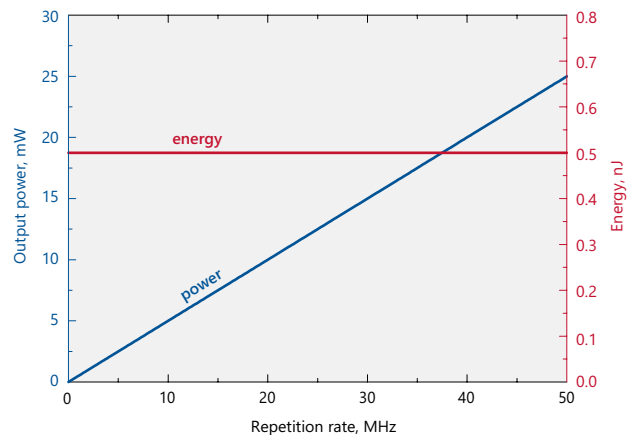
Broad up to 15 nm spectral bandwidth enables amplification of pulses with < 200 fs compressed duration. Special feature of FFS200CHI laser is customizable chirp profile to match compressor design of the CPA system.

## APPLICATIONS

- ▶ Seeding femtosecond CPA systems
- ▶ Ultrafast spectroscopy
- ▶ Time-domain terahertz spectroscopy



Typical dependence of average power on the repetition rate for FFS200CHI laser



Typical dependence of average power (blue curve) and pulse energy (red curve) on the repetition rate for FFS100CHI-AOM laser

SPECIFICATIONS <sup>1)</sup>

Model	FFS100CHI	FFS200CHI	FFS200
Central wavelength <sup>2)</sup>	1030 ± 1 nm		1064 nm
Typical spectral bandwidth (at FWHM)	up to 15 nm		> 20 nm
Pulse duration	Up to 30 ps, compressible down to < 200 fs	> 50 ps, compressible down to < 250 fs	< 140 fs
Chirp profile	linear, custom <sup>3)</sup>		NA
Oscillator pulse repetition rate	50 ± 2 MHz		
Pulse repetition rate with pulse picker <sup>4)</sup>	25 kHz – 50 MHz (PRR = PRR <sub>osc</sub> / N, N = 1, 5, 6, ..., 2000)	100 kHz – 50 MHz (PRR = PRR <sub>osc</sub> / N, N = 1, 5, 6, ..., 500)	25 kHz – 50 MHz (PRR = PRR <sub>osc</sub> / N, N = 1, 5, 6, ..., 2000)
Output power (without/with pulse picker)	> 50 mW / > 25 mW	> 200 mW at 50 MHz > 100 mW at 1 MHz > 25 mW at 100 kHz	> 200 mW / > 100 mW
Pulse energy (without/with pulse picker)	> 1 nJ / > 0.5 nJ	> 250 nJ at repetition rates < 200 kHz	> 5 nJ / > 2.5 nJ
Polarization	linear, > 100:1 extinction		linear, > 10:1 extinction
Optical output	FC/APC connector or collimator with mounting flange (optional)	collimator & isolator node <sup>5)</sup>	FC/PC connector <sup>6)</sup> or collimated beam (optional)
Output fiber length	up to 5 m	up to 3 m	up to 2 m
Beam diameter	0.9 ± 0.1 mm		
Beam height	NA	38 mm	NA
Beam quality	M <sup>2</sup> < 1.1		M <sup>2</sup> < 1.5
Pulse train monitoring	photodiode output for oscillator train, TTL synch pulse for laser output (when pulse picker included)		
Dimensions of collimator (D × L)	Ø33.02 × 11.76 mm		
Control interface	CAN (USB, RS232, LAN optional)		
Power supply (AC/DC adapter included)	100–240 V, 50–60 Hz AC		
Power consumption	maximal 230 W (typical 60 W)		
Operating conditions	10–30 °C, humidity – not condensing		

<sup>1)</sup> Due to continuous improvement all specifications are subject to change without notice.

<sup>2)</sup> Other wavelengths available on request for FFS100CHI/FFS200CHI.

<sup>3)</sup> Chirp profile will be optimized by Ekspla to match customer compressor design.

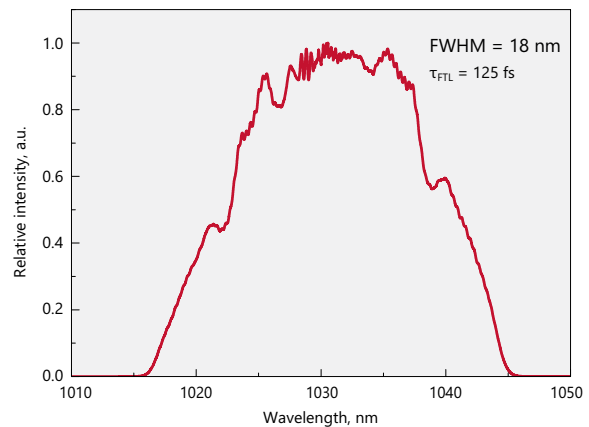
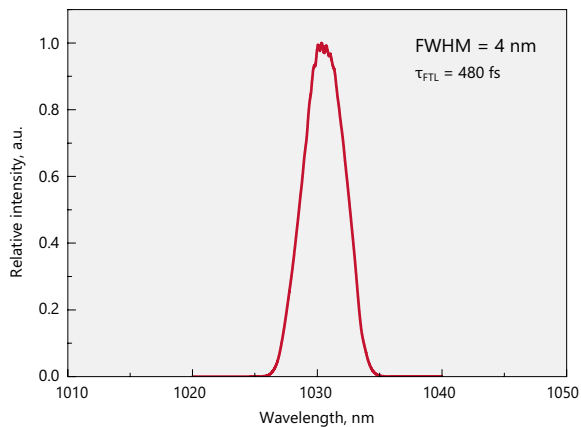
<sup>4)</sup> Pulse picker is an option for FFS100 and FFS200 models. It supports external gating. FFS200CHI includes internal frequency divider, which enables pulse repetition rate reduction but does not support external gating.

<sup>5)</sup> FFS200CHI model is provided with collimator & isolator node with dimensions 138×66.6×52 mm.

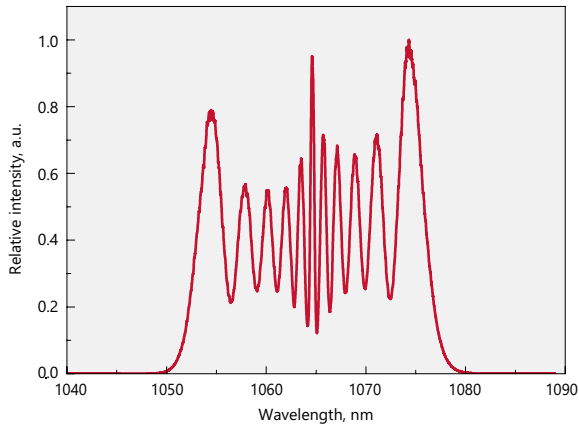
<sup>6)</sup> The connector is not suitable to connect with single mode fiber.



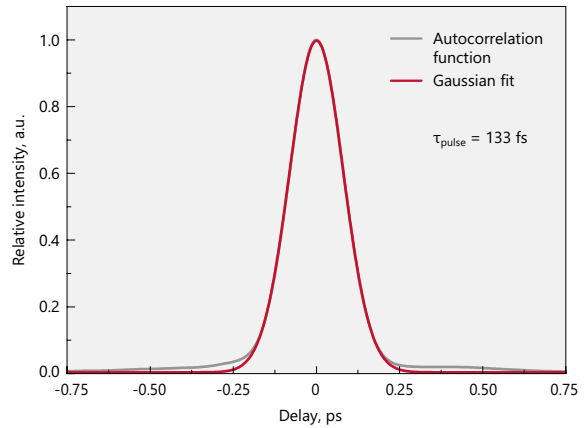
PERFORMANCE



Typical narrowband (FWHM = 4 nm) and broadband (FWHM = 18 nm) spectra from FFS100CHI/FFS200CHI lasers

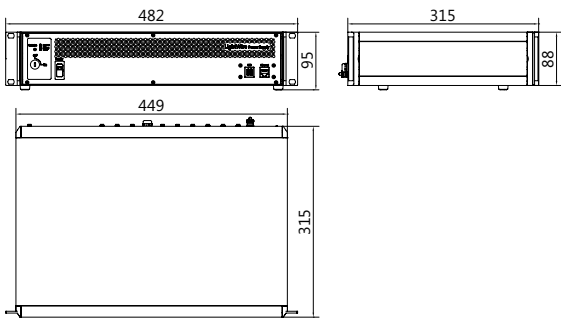


Typical spectrum from FFS200 laser

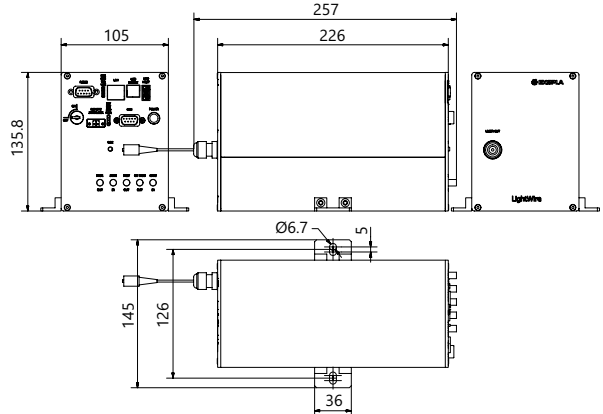


Typical autocorrelation from FFS200 laser

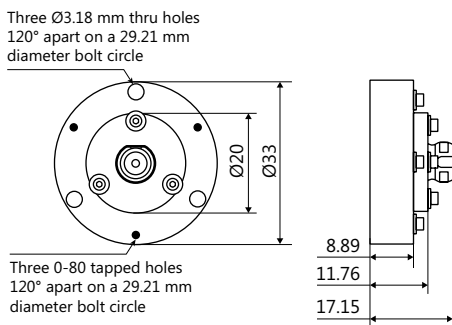
**DRAWINGS**



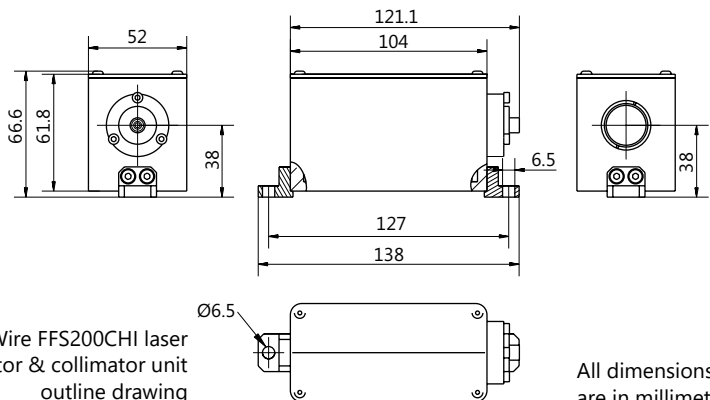
LightWire FFS series control unit outline drawing (19" rack mountable version)



LightWire FFS series "Compact" version drawing. Example only. Actual dimensions depends on a selected laser configuration and options. Please enquire



LightWire FFS100CHI laser collimator flange outline drawing for beam diameters 0.9 mm



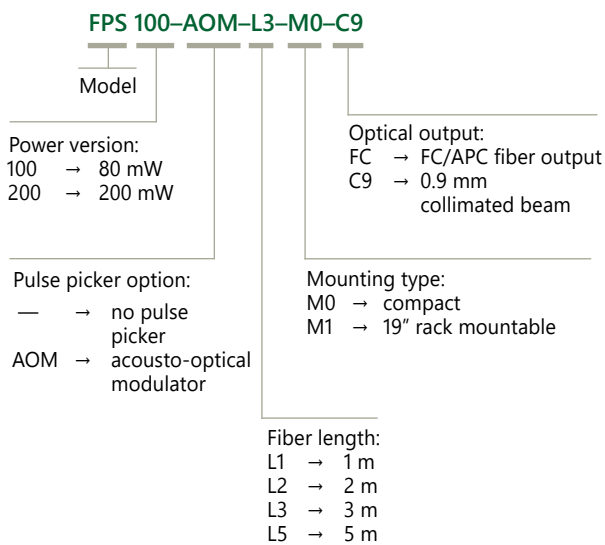
LightWire FFS200CHI laser isolator & collimator unit outline drawing

All dimensions are in millimetres.

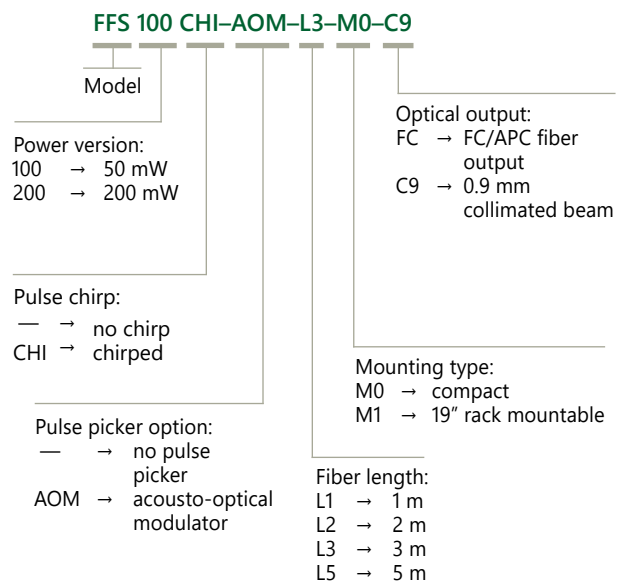
TABLE REPRESENTING PULSE CONTROL TECHNOLOGY IMPLEMENTED IN VARIOUS FIBER LASER MODELS AND MODIFICATIONS

Model	Oscillator + amplifier	Oscillator + amplifier + frequency divider
FPS100	■	
FPS100-AOM		■
FPS200		■
FFS100CHI	■	
FFS100CHI-AOM		■
FFS200CHI		■
FFS200	■	
FFS200-AOM		■

ORDERING INFORMATION FOR FPS AND FFS SERIES



Note:  
For FPS200 model  
maximal fiber length is 3 m.



Note:  
For FFS200CHI model  
maximal fiber length is 3 m.  
For FFS200 model  
maximal fiber length is 2 m.