

# LightWire FPS series

Compact  
Fiber Seeders for  
Picosecond Lasers



## FEATURES

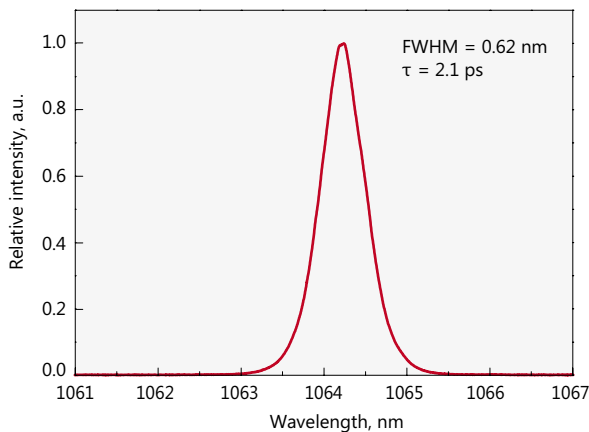
- ▶ Pulse energy >50 nJ at repetition rate <1 MHz
- ▶ Sub-10 ps pulse duration
- ▶ Close to Fourier-transform limited spectral bandwidth
- ▶ Integrated fiber pulse picker for flexible repetition rate control (20 kHz – 40 MHz, burst mode available)

## APPLICATIONS

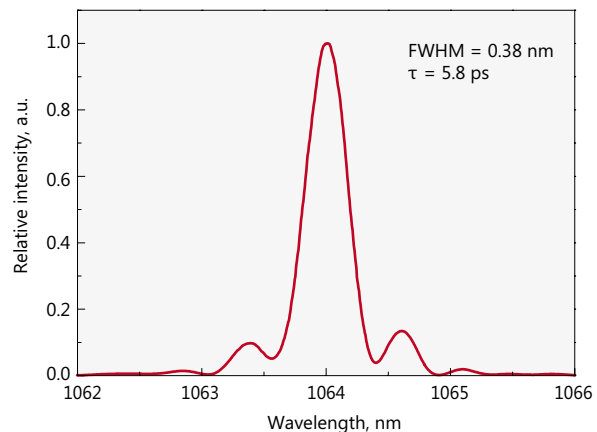
- ▶ Seeding solid state amplifiers

LightWire FPS series fiber lasers are dedicated for seeding solid state Nd:YAG amplifiers. Compact, cost efficient FPS series models deliver sub-10 ps pulses at 1064 nm wavelength with the average output power up to 200 mW and pulse

energy up to 50 nJ. They feature narrow close to bandwidth limited spectrum and low pulse amplitude noise. Wavelength tunability ensures that seed pulses are always spectrally overlapped with the amplification spectrum of your amplifier.



Typical spectrum from FPS10 laser



Typical spectrum from FPS100 laser

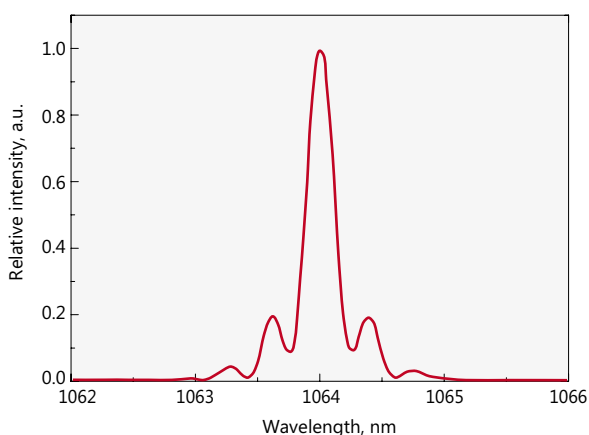
**SPECIFICATIONS <sup>1)</sup>**

| Model   | FPS10   | FPS100            | FPS200  |
|---|---|-------------------|---|
| Central wavelength                                    | 1064 nm, tunable $\pm 0.2$ nm   |                   |   |
| Pulse duration  | $2.3 \pm 0.3$ ps  | $7 \pm 1$ ps      | $9 \pm 1$ ps  |
| Spectral bandwidth                                    | $0.7 \pm 0.2$ nm  | $0.4 \pm 0.1$ nm  | $0.25 \pm 0.05$ nm  |
| Oscillator pulse repetition rate                      | $40 \pm 2$ MHz  |                   |   |
| Pulse repetition rate with pulse picker <sup>2)</sup> | 20 kHz – 40 MHz (PRR = PRR <sub>osc</sub> / N, N = 1, 4, 5, ..., 2000)                                |                   |   |
| Output power (without/with pulse picker)              | > 2 mW / > 1 mW   | > 80 mW / > 40 mW | > 200 mW at 10 MHz<br>> 40 mW at 1 MHz<br>> 5 mW at 100 kHz |
| Pulse energy (without/with pulse picker)              | > 50 pJ / > 25 pJ   | > 2 nJ / > 1 nJ   | > 50 nJ at repetition rates < 200 kHz                       |
| Polarization  | linear, > 100:1 extinction  |                   |   |
| Optical output  | FC/APC connector or collimator with mounting flange (optional)  |                   | collimator & isolator node <sup>3)</sup>                    |
| Umbilical   | 3 m length armored cable $\varnothing 5$ mm   |                   |   |
| Collimated beam diameter                              | $0.9 \pm 0.1$ mm or $1.3 \pm 0.1$ mm or $2.1 \pm 0.2$ mm  |                   | $0.9 \pm 0.1$ mm  |
| Beam height   | NA  |                   | 38 mm   |
| Beam quality  | $M^2 < 1.1$   |                   |   |
| Pulse train monitoring                                | photodiode output for oscillator train, TTL synch pulse for laser output (when pulse picker included) |                   |   |
| Dimensions of control unit (L x W x H)                | 315 x 450 x 95 (stand alone) or 315 x 482 x 95 (19" rack mountable)                                   |                   |   |
| Dimensions of collimator (D x L)                      | $\varnothing 33 \times 11.76$ mm  |                   |   |
| Dimensions of collimator & isolator node (L x W x H)  | 138 x 66.6 x 52 mm  |                   |   |
| Weight  | < 10 kg   |                   |   |
| Control interface                                     | USB, CAN, RS232, LAN, (WLAN option)   |                   |   |
| 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   |                   |   |

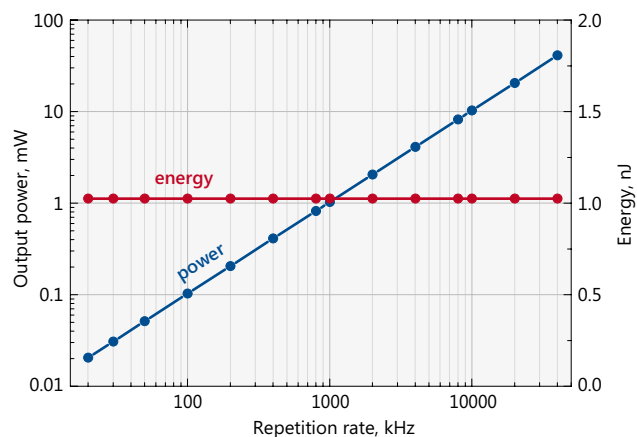


<sup>1)</sup> Due to continuous improvement all specifications are subject to change without notice.  
<sup>2)</sup> Pulse picker is an option for FPS10, FPS100 models. It supports external gating. FPS200 includes internal frequency divider, which enables pulse repetition rate reduction but does not support external gating.  
<sup>3)</sup> FPS200 model is provided with collimator & isolator node with dimensions 138x66.6x52 mm.

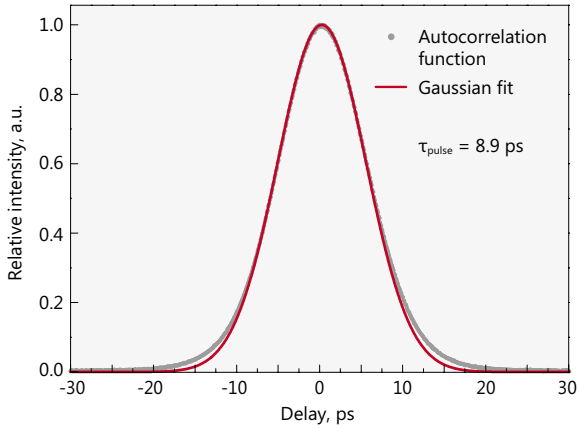
**PERFORMANCE**



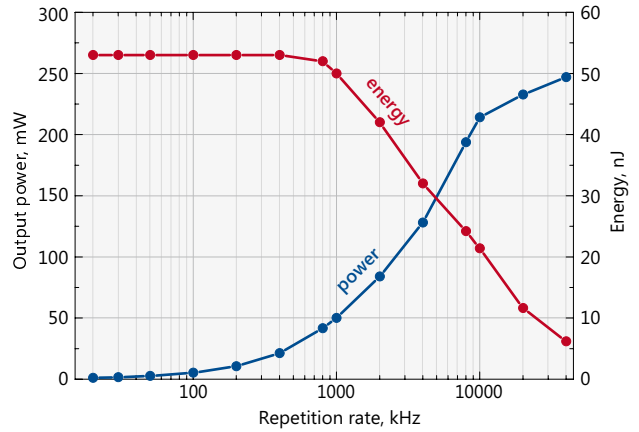
Typical spectrum from FPS200 laser



Typical dependence of average power (blue curve) and pulse energy (red curve) on the repetition rate for FPS100-AOM laser

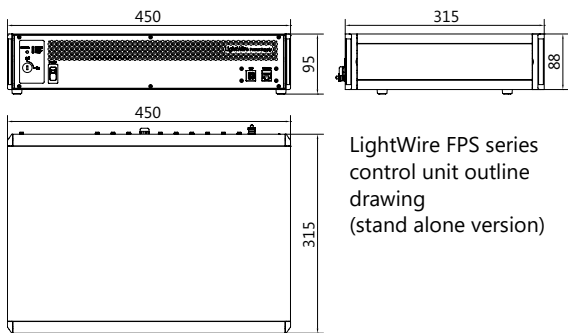


Typical autocorrelation curve of FPS200 laser

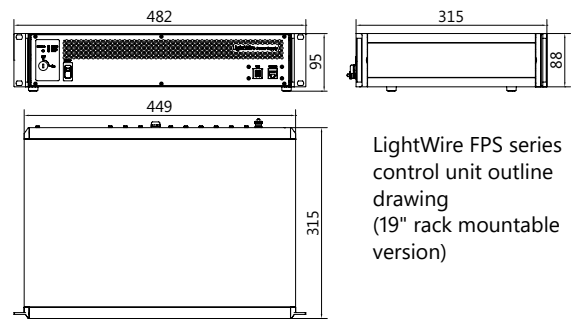


Typical dependence of average power (blue curve) and pulse energy (red curve) on the repetition rate for FPS200 laser

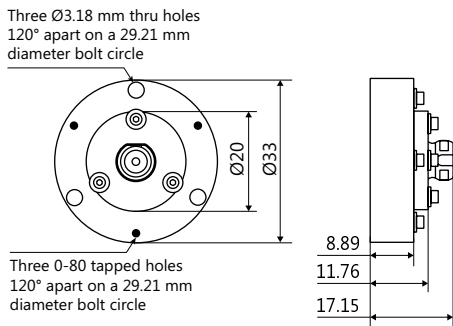
DRAWINGS



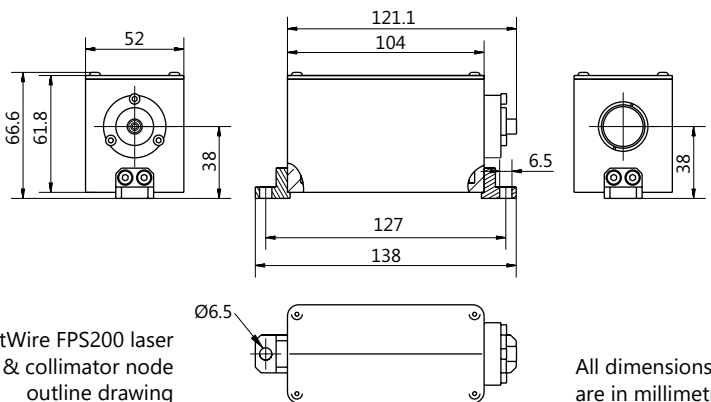
LightWire FPS series control unit outline drawing (stand alone version)



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

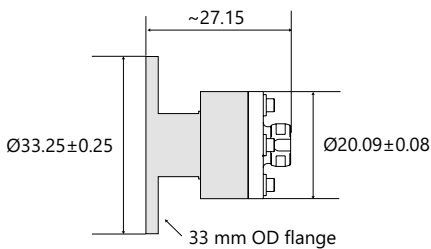


LightWire FPS10/100 laser collimator flange outline drawing for beam diameters 0.9 mm and 1.3 mm



LightWire FPS200 laser isolator & collimator node outline drawing

All dimensions are in millimetres.



LightWire FPS10/100 laser collimator flange outline drawing for beam diameter 2.1 mm

# LightWire FP200

Compact  
Picosecond  
Fiber Laser



### FEATURES

- ▶ Pulse energy > 50 nJ at repetition rate < 200 kHz
- ▶ 9 ps pulse duration
- ▶ Close to transform limited pulse duration
- ▶ Integrated fiber pulse picker for flexible repetition rate control (20 kHz – 40 MHz, burst mode available)

### APPLICATIONS

- ▶ Ultrafast/nonlinear spectroscopy and microscopy
- ▶ Metrology

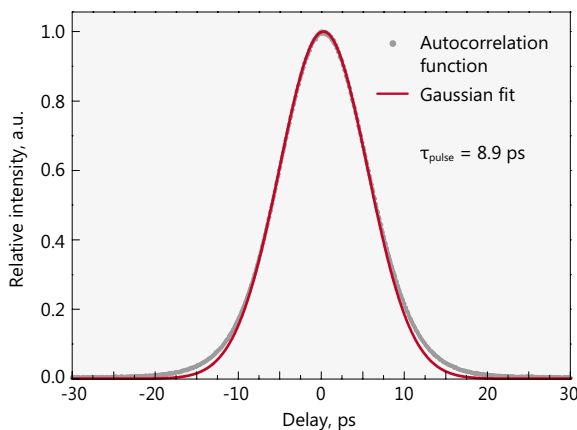
LightWire FP200 laser is dedicated for researchers and OEM integrators, who require small, convenient and maintenance free source with transform limited picosecond pulses. Widely tunable pulse repetition rate 20 kHz – 40 MHz makes it an excellent

choice for non-linear microscopy, time-resolved spectroscopy, terahertz spectroscopy, ultrafast metrology applications. FP200 model is available with second harmonic option (532 nm).

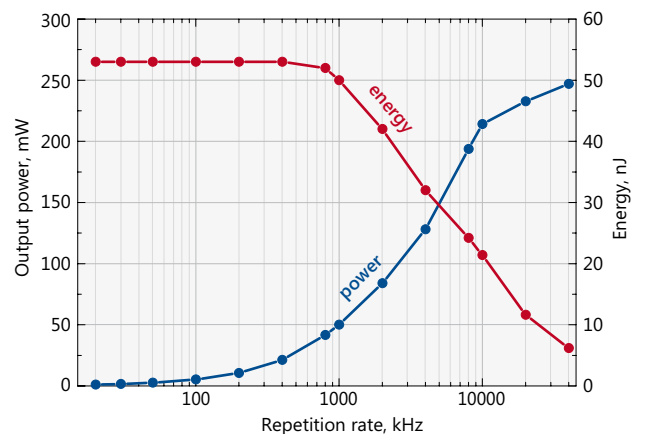
### OPTIONS

- ▶ Second harmonic generation module (532 nm). Peak conversion efficiency: 30% for SH [code: FP200-SH].

### PERFORMANCE



Typical autocorrelation curve of FP200 laser



Typical dependence of average power (blue curve) and pulse energy (red curve) on the repetition rate for FP200 laser

**SPECIFICATIONS <sup>1)</sup>**

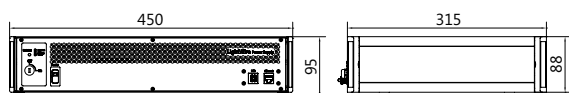
| Model  | FP200   |
|--|---|
| Central wavelength                                   | 1064 nm, tunable $\pm 0.2$ nm   |
| Pulse duration                                       | $9 \pm 1$ ps  |
| Spectral bandwidth                                   | $0.25 \pm 0.05$ nm  |
| Oscillator pulse repetition rate                     | $40 \pm 2$ MHz  |
| Pulse repetition rate range using frequency divider  | 20 kHz – 40 MHz<br>( $PRR = PRR_{osc} / N$ , $N = 1, 4, 5, \dots, 2000$ )   |
| Output power   | > 200 mW at 10 MHz<br>> 40 mW at 1 MHz<br>> 5 mW at 100 kHz                 |
| Pulse energy   | > 50 nJ at repetition rates < 200 kHz                                       |
| Polarization   | linear, vertical, > 100:1 extinction  |
| Optical output                                       | collimator & isolator node <sup>2)</sup> (free space output)                |
| Umbilical  | 3 m length armored cable $\varnothing 5$ mm                                 |
| Beam diameter  | $0.9 \pm 0.1$ mm  |
| Beam height  | 48 mm   |
| Beam quality   | $M^2 < 1.1$   |
| Pulse train monitoring                               | photodiode output for oscillator train,<br>TTL synch pulse for laser output |
| Dimensions of control unit (L x W x H)               | 315 x 450 x 95 (stand alone) or<br>315 x 482 x 95 (19" rack mountable)      |
| Dimensions of collimator & isolator node (L x W x H) | 164 x 72 x 73 mm  |
| Weight (with/without pulse picker)                   | < 10 kg   |
| Control interface                                    | USB, CAN, RS232, LAN, WLAN  |
| 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   |



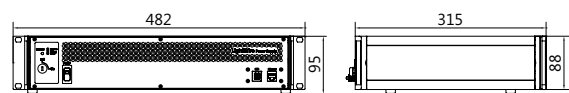
<sup>1)</sup> Due to continuous improvement all specifications are subject to change without notice.

<sup>2)</sup> FP200 model is provided with specially designed collimator & isolator node, which shouldn't be disconnected from output fiber without Ekspla approval.

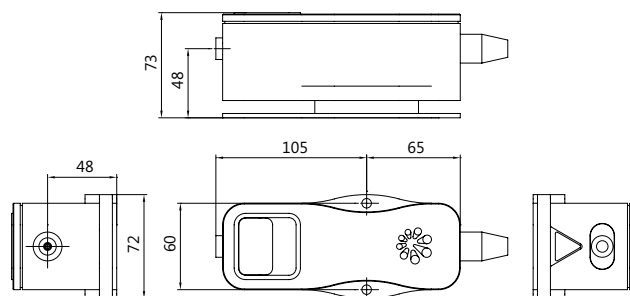
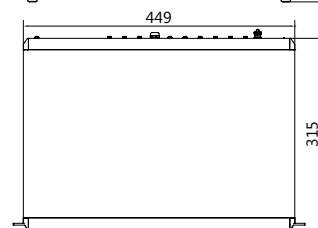
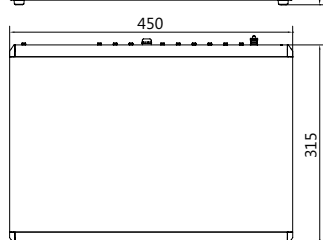
**DRAWINGS**



LightWire FP200 control unit outline drawing (stand alone version)



LightWire FP200 control unit outline drawing (19" rack mountable version)



LightWire FP200 laser isolator & collimator unit outline drawing

All dimensions are in millimetres.