FS Series

FS Femtosecond Lasers

Experience unmatched precision with Photonics Industries' FS Series Femtosecond Lasers. With ultra-short pulses (<550 fs), up to 200 W at 1030 nm, and high repetition rates up to 8 MHz, these compact lasers deliver high-efficiency performance for any application requiring speed, accuracy, or versatility. Designed for seamless integration, the FS Series delivers up to >1.3mJ single-pulse energy in a compact all-in-one design, eliminating bulky external components. It’s perfect for industrial systems and advanced research.

APPLICATIONS

- Glass Cutting, engraving and drilling.
- Through Glass Via (TGV) and interposer processing.
- Semiconductor and Microelectronics Processing
- Precision Micromachining of metals and ceramics
- Foils and Films for Batteries and Superconductors.
- UV Processing of Polymers and Organic Materials
- Polymer Cutting & Drilling
- Quantum Technology Development
- Medical Device Manufacturing

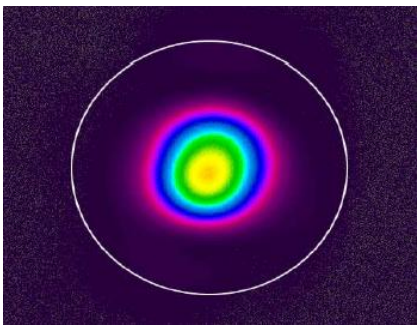
FEATURES

- Up to 1.3mJ Pulse Energy at 100kHz
- True TEM_{00} Output
- Ultrafast Short Pulse Widths
- **DIGI-Burst™** Mode for Pulse Control
- **FLEX-Pulse™** suit of controls including:
- Dynamic **P**ulse **E**nergy **C**ontrol - **PEC**
- **P**osition **S**ynchronized **O**utput - **PSO**
- Power Monitoring and Self-Calibration
- Robust & Compact Monolithic Form Factor

Specifications – **FS Series**				
	FS-1030-50	**FS-1030-100**	**FS-1030-150**	**FS-1030-200**
Wavelength (nm)[1]	1030 ± 5			
Average Power (W) @ 1MHz	50	100	150	200
Pulse Energy (µJ) @100kHz	>250	> 700	>1000	>1300
Pulse Width [2]	<550fs to 5ps		<650fs – 5ps	
Pulse repetition rate [3,4]	Single shot to 2 MHz			
Pulse-to-pulse stability (RMS %)[5]	~1			
Long-term power stability (RMS %) [6]	<1			
Beam spatial mode[†] & M^2	TEM_{00} - M^2 <1.3			
Beam Diameter at 1 MHz (mm)	2+/-0.5	2.5+/-0.5	3+/-0.5	
Pulse Picker Leakage (dB)	40			
Beam Roundness (%)	~90			
Beam pointing stability (µrad)[†]	<25			
Polarization ratio	>100:1			
	Operational Specifications and Characteristics			
Interface	RS232, Ethernet, Software GUI, External TTL Triggering			
Warm-up time	< 30 Minutes			
Electrical requirement	100-240V AC		200-240V AC	
Line frequency (Hz)	50-60			
Power consumption (W)[7]	<700	<1000	<1600	<2000
Dimensions	20 x 10 x 4.25 in. [508 x 254 x 107.95mm]	22 x 10 x 4.25in [558.8 x 254 x 107.95mm]	24 x 12 x 4.5in [609.6 x 304.8 x 107.95mm]	24 x 14 x 4.5 in [609.6 x 355.6 x 107.95mm]
Weight	60lbs [~27kg]	~65lbs [~29.5kg]	~73lbs [33.1kg]	~90lbs [41kg]
	Environmental Requirements			
Ambient temperature [2]	Ambient 15°C to 30°C (59°F to 86°F) Operating Range			
	Relative humidity 0% to 80% max, non-condensing			
Storage conditions	-10°C to 40°C; sea level to 12000 m			
	0% to 80% relative Humidity, non-condensing			
Cooling system	Water-Cooled			

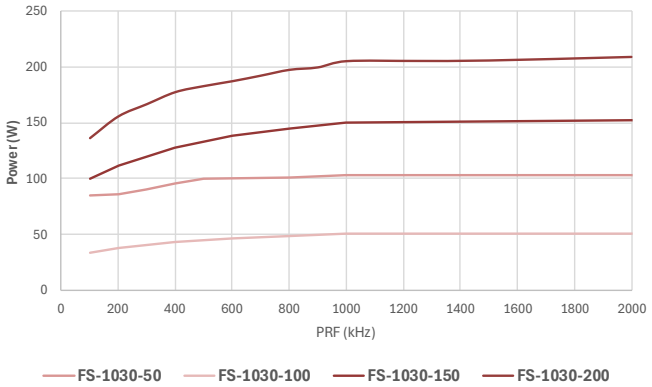
[1.] Multi-wavelength options are available. Contact us. [2.] Specifiable pulse width. [3.] Lower repetition rates, down to single shot, achieved by utilizing PSO. [4.] Fixed pulse repetition rate at ~32 MHz available on request. [5.] Measured at ambient temperature ± 2°C. [6.] Measured over 8 hours ± 1°C. [7.] Power consumption data does not include an external chiller's power consumption. [†] Tested with laser mounted horizontally. [NB] All specifications are at the optimized repetition rate. [*] For Dimensional Drawing, please contact PI

Typical Beam Profile



FS-1030-100 @ 1MHz

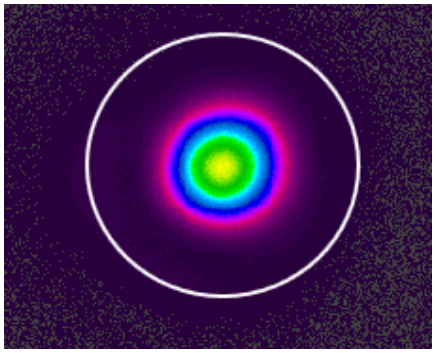
Power Vs. PRF



Specifications – **FS Series**				
	FS-515-25	**FS-515-50**	**FS-515-75**	**FS-515-100**
Wavelength (nm)[1]	515 ± 3			
Average Power (W) @ 1MHz	25	50	75	100
Pulse Energy (µJ) @100kHz	>125	>350	>550	>750
Pulse Width [2]	<550fs to 5ps		<650fs – 5ps	
Pulse repetition rate) [3,4]	Single shot to 2MHz			
Pulse-to-pulse stability (RMS %)[5]	~1			
Long-term power stability (RMS %) [6]	≤1			
Beam spatial mode[†] & M^2	TEM_{00} - M^2 <1.3			
Beam Diameter at 1 MHz (mm)	1.4+/-0.3	1.8+/-0.3	2.2+/-0.3	2.6+/-0.3
Pulse Picker Leakage (dB)	40			
Beam Roundness (%)	~90			
Beam pointing stability (µrad)[†]	~25			
Polarization ratio	>100:1			
	Operational Specifications and Characteristics			
Interface	RS232, Ethernet, Software GUI, External TTL Triggering			
Warm-up time	< 30 Minutes			
Electrical requirement	100-240V AC		200-240V AC	
Line frequency (Hz)	50-60			
Power consumption (W)[7]	<700	<1000	<1500	<2000
Dimensions	20 x 10 x 4.25 in. [508 x 254 x 107.95mm]	22 x 10 x 4.25in [558.8 x 254 x 107.95mm]	24 x 12 x 4.5in [609.6 x 304.8 x 107.95mm]	24 x 14 x 4.5 in [609.6 x 355.6 x 107.95mm]
Weight	60lbs [~27kg]	65lbs [~29.5kg]	~73lbs [33.1kg]	~90lbs [41kg]
	Environmental Requirements			
Ambient temperature [2]	Ambient 15°C to 30°C (59°F to 86°F) Operating Range			
	Relative humidity 0% to 80% max, non-condensing			
Storage conditions	-10°C to 40°C; sea level to 12000 m			
	0% to 80% relative Humidity, non-condensing			
Cooling system	Water-Cooled			

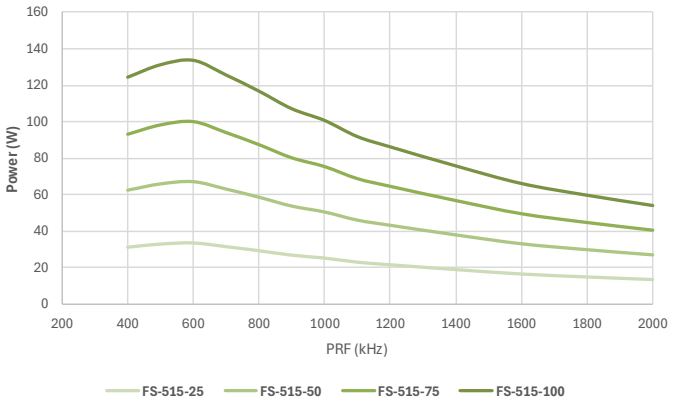
[1.] Multi-wavelength options are available. Contact us. [2.] Specifiable pulse width. [3.] min PRF for standard model is 1 MHz, custom min PRF down to 100 kHz is available. Lower repetition rates, down to single shot, achieved by utilizing PSO. [4.] Fixed pulse repetition rate at ~32 MHz available on request. [5.] Measured at ambient temperature ± 2°C. [6.] Measured over 8 hours ± 1°C. [7.] Power consumption data does not include an external chiller's power consumption. [†] Tested with laser mounted horizontally. [NB] All specifications are at the optimized repetition rate. [*] For Dimensional Drawing, please contact PI

Typical Beam Profile



FS-515-25 @ 1MHz

Power Vs. PRF



Specifications – **FS Series**				
	FS1-343-10	**FS-343-25**	**FS-343-50**	**FS-343-60**
Wavelength (nm)[1]	343 ± 2			
Average Power (W) @ 1MHz	10	25	45	60
Pulse Energy (µJ) @ 100kHz	>10	>25	>45	>60
Pulse Width [2]	<550fs to 5ps		<650fs to 5ps	
Pulse repetition rate [3,4]	Single shot to 2MHz			
Pulse-to-pulse stability (RMS %)[5]	~1			
Long-term power stability (RMS %) [6]	≤1			
Beam spatial mode[†] & M^2	TEM_{00} - M^2 <1.3			
Pulse Picker Leakage (dB)	40			
Beam Roundness (%)	~90			
Beam pointing stability (µrad)[†]	<25			
Polarization ratio	>100:1			
	Operational Specifications and Characteristics			
Interface	RS232, Ethernet, Software GUI, External TTL Triggering			
Warm-up time	< 30 Minutes			
Electrical requirement	100-240V AC		200-240V AC	
Line frequency (Hz)	50-60			
Power consumption (W)[7]	<600	<900	<1500	<2000
Dimensions	20 x 10 x 4.25 in. [508 x 254 x 107.95mm]	22 x 10 x 4.25in [558.8 x 254 x 107.95mm]	24 x 12 x 4.5in [609.6 x 304.8 x 107.95mm]	24 x 14 x 4.5 in [609.6 x 355.6 x 107.95mm]
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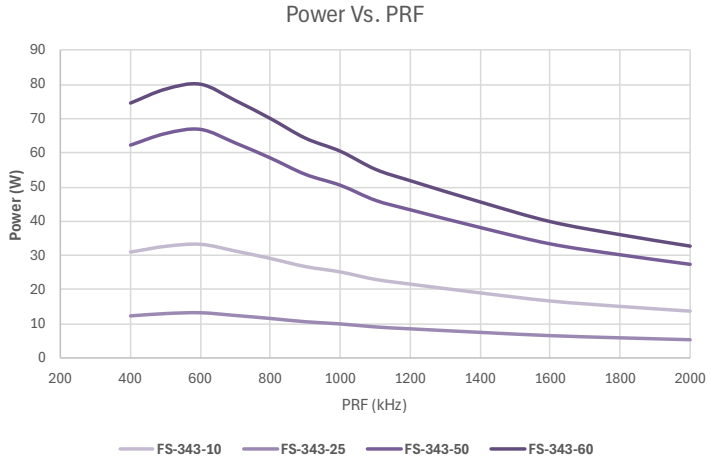
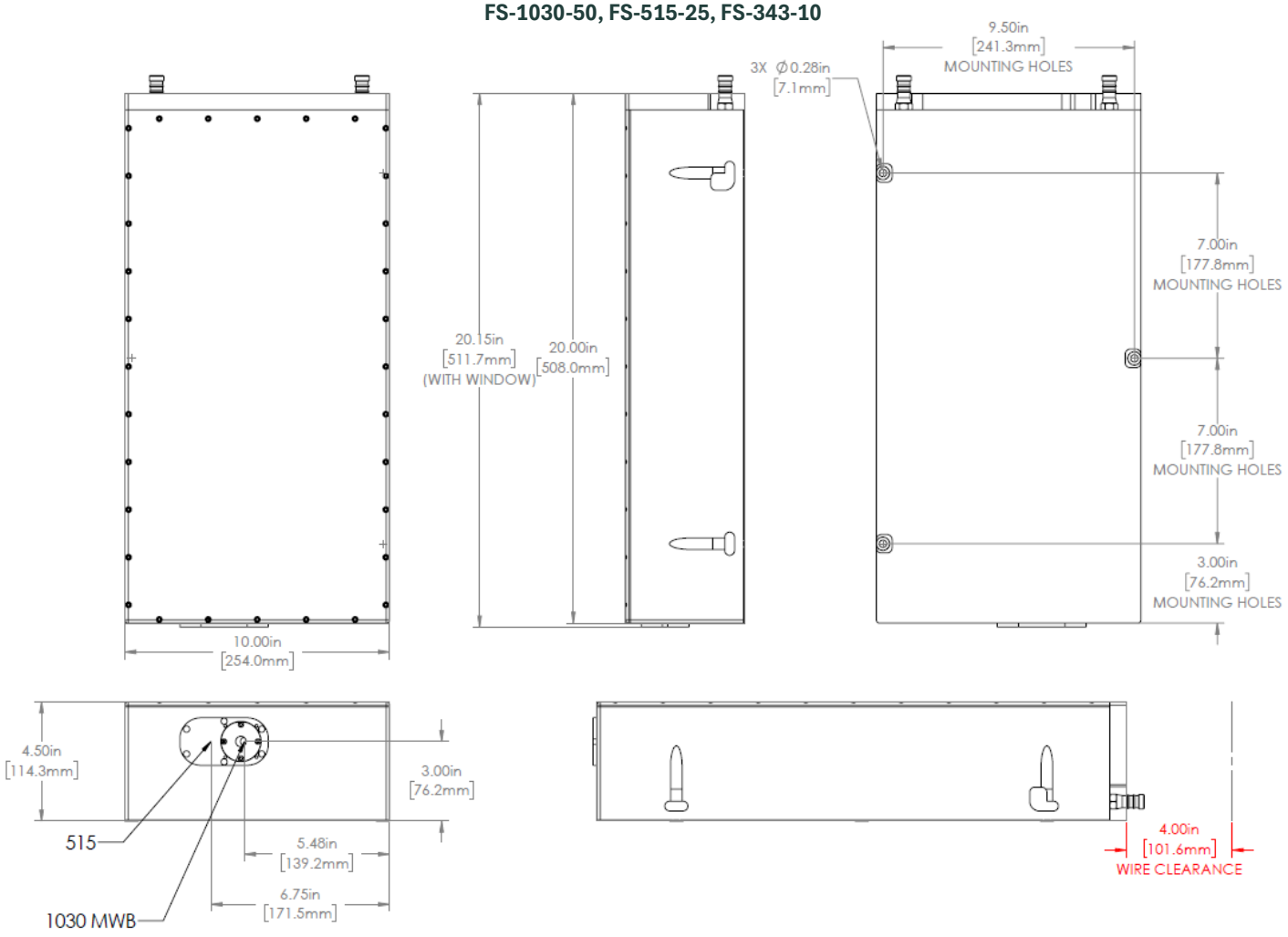
	Environmental Requirements			
Ambient temperature [2]	Ambient 15°C to 30°C (59°F to 86°F) Operating Range			
	Relative humidity 0% to 80% max, non-condensing			
Storage conditions	-10°C to 40°C; sea level to 12000 m			
	0% to 80% relative Humidity, non-condensing			
Cooling system	Water-Cooled			

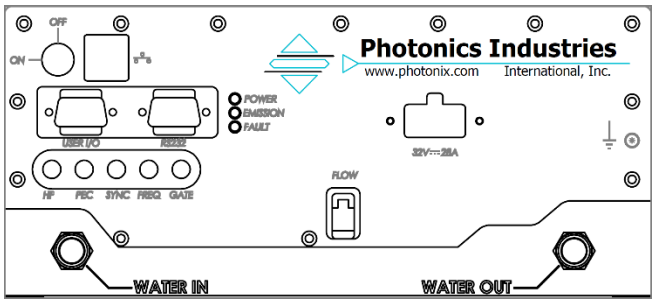
[1.] Multi-wavelength options are available. Contact us. [2.] Specifiable pulse width. [3.] Lower repetition rates, down to single shot, achieved by utilizing PSO. [4.] Fixed pulse repetition rate at ~32 MHz available on request. [5.] Measured at ambient temperature ± 2°C. [6.] Measured over 8 hours ± 1°C. [7.] Power consumption data does not include an external chiller's power consumption. [†] Tested with laser mounted horizontally. [NB] All specifications are at the optimized repetition rate. [*] For Dimensional Drawing, please contact PI

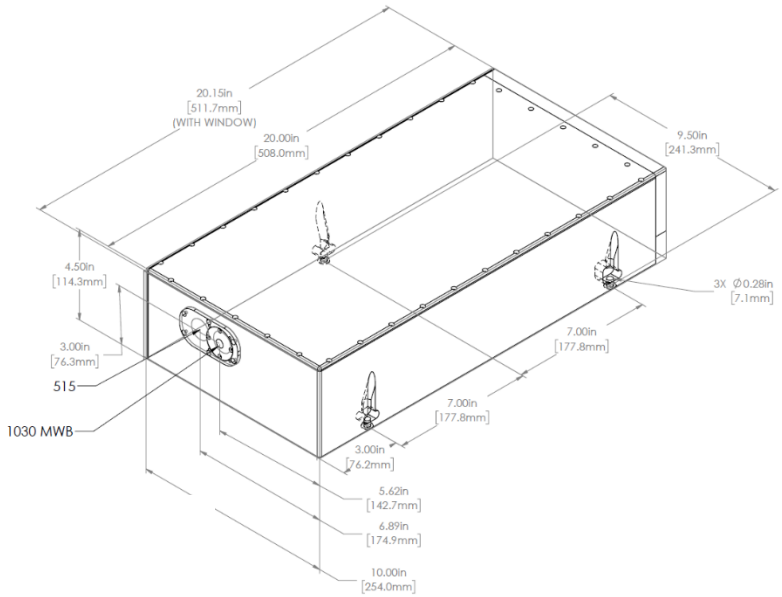


Dimensional Drawings

FS-1030-50, FS-515-25, FS-343-10

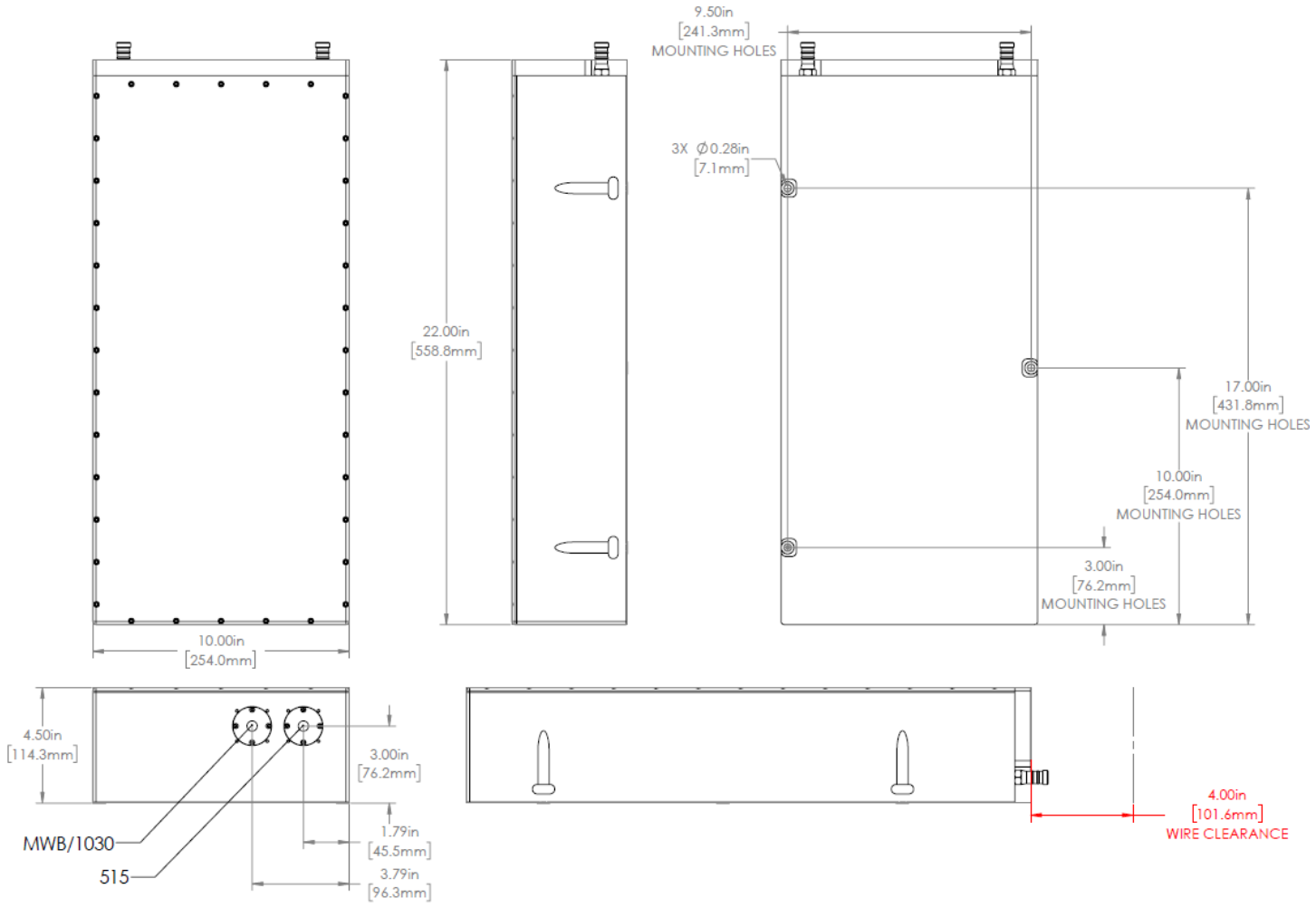


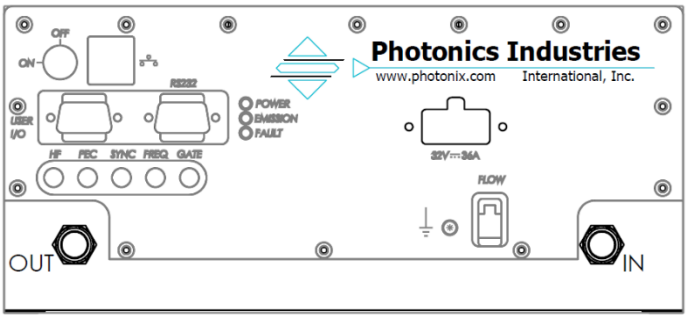


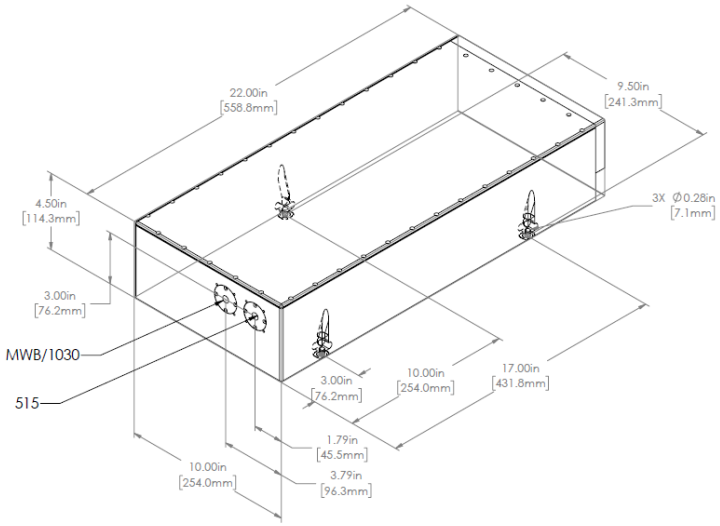


Dimensional Drawings

FS-1030-100, FS-515-50, FS-343-25

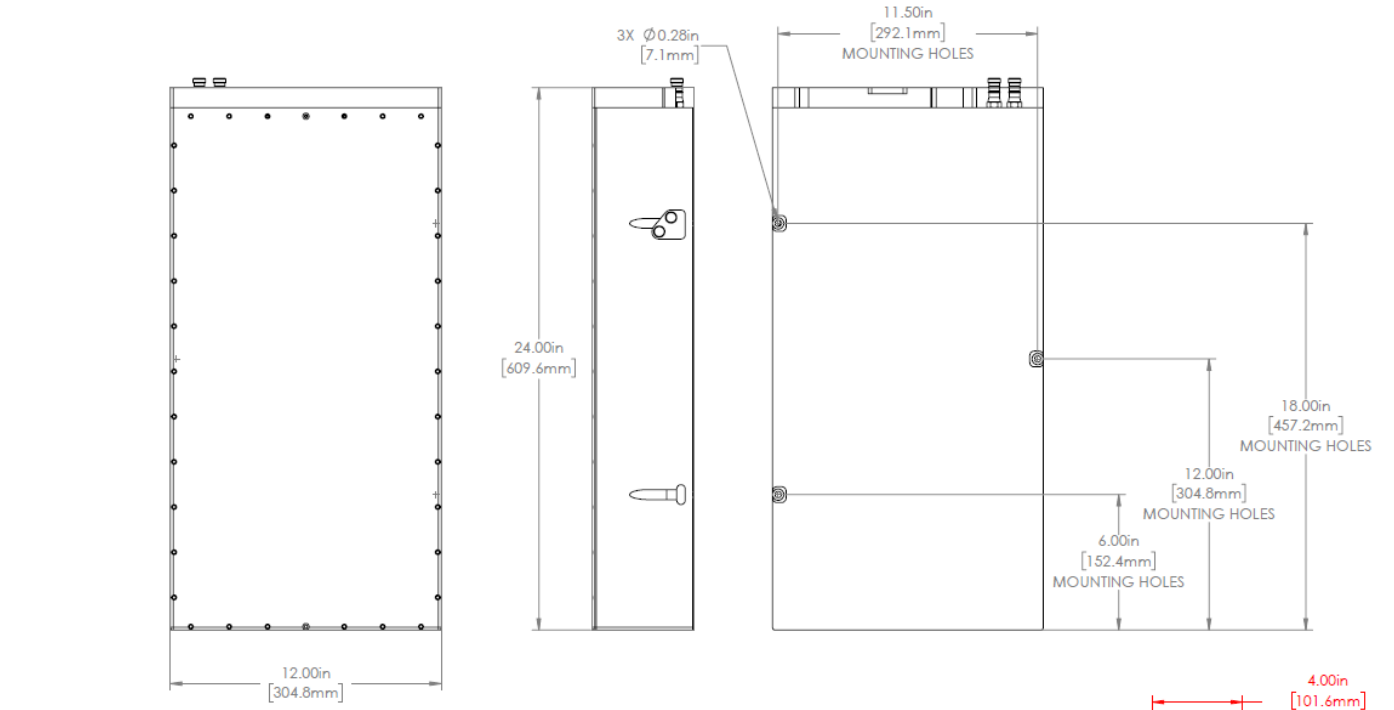


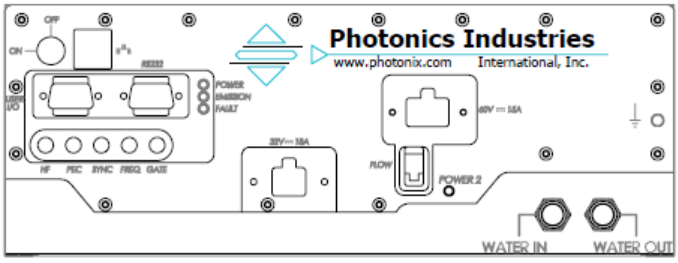


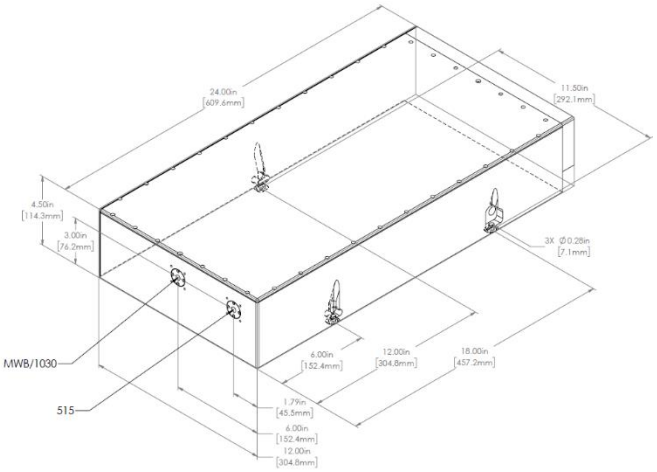


Dimensional Drawings

FS-1030-150, FS-515-100, FS-343-50







Our ongoing policy is to improve the design and specification of our products. The information provided is non-binding.

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Photonics Industries International Inc. is the pioneer of intracavity harmonic lasers and is at the forefront of developing, manufacturing, and marketing a wide range of nanosecond, sub-nanosecond, picosecond, and femtosecond lasers for the industrial, scientific, defense and medical industries.

For more information www.photonix.com

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RoHS Compliant