

FS Series

FS Femtosecond Lasers

Experience unmatched precision with Photronics 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

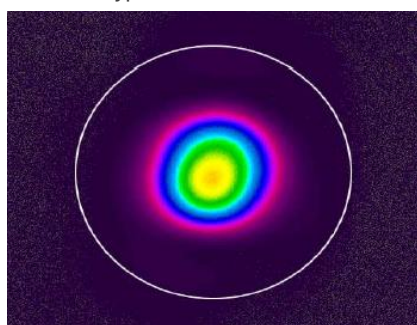
FEATURES

- Up to 1.3mJ Pulse Energy at 100kHz
- True TEM₀₀ Output
- Ultrafast Short Pulse Widths
- **DIGI-Burst™** Mode for Pulse Control
- **FLEX-Pulse™** suit of controls including:
 - Dynamic Pulse Energy Control - **PEC**
 - Position Synchronized Output - **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	32 V DC, 28 A	32V DC, 36A	32V DC, 18A / 48V DC, 16A	36V DC, 60A
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			

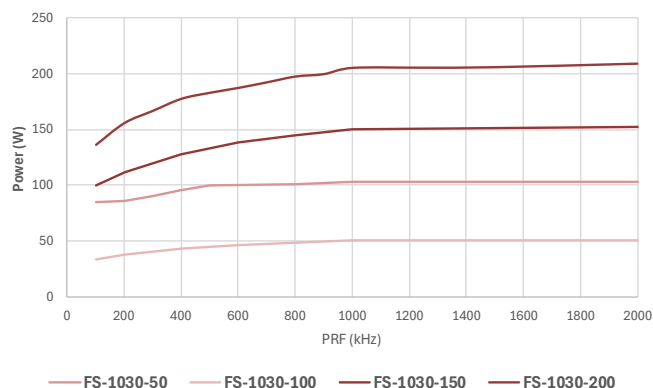
[1.] Multi-wavelength options are available. Contact us. [2.] Specifiable pulse width. [3.] Lower repetition rates, down to single shot, achieved by utilizing PSO. [4.] Fixed pulse repetition rate at ~32 MHz available on request. [5.] Measured at ambient temperature ± 2°C. [6.] Measured over 8 hours ± 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

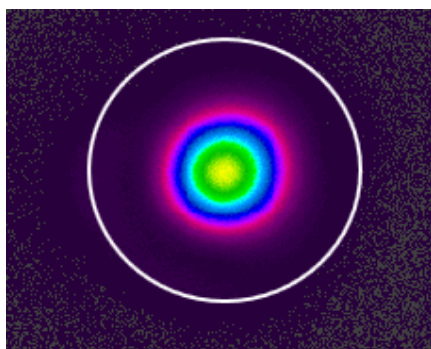
Power Vs. PRF



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	32 V DC, 28 A	32V DC, 36A	32V DC, 18A / 48V DC, 16A	36V, 60A
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]
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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			

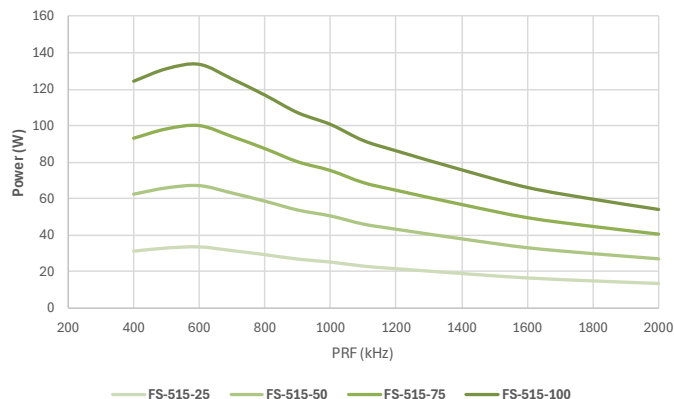
[1.] Multi-wavelength options are available. Contact us. [2.] Specifiable pulse width. [3.] min PRF for standard model is 1 MHz, custom min PRF down to 100 kHz is available. Lower repetition rates, down to single shot, achieved by utilizing PSO. [4.] Fixed pulse repetition rate at ~32 MHz available on 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

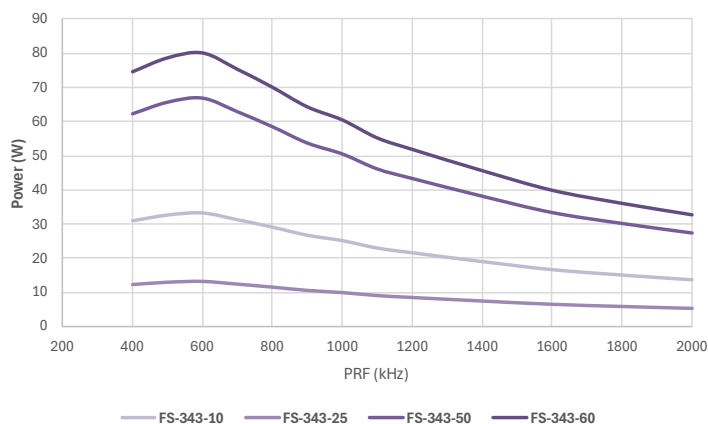
Power Vs. PRF



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	32 V DC, 28 A	32V DC, 36A	32V DC, 18A / 48V DC, 16A	36V, 60A
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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	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			

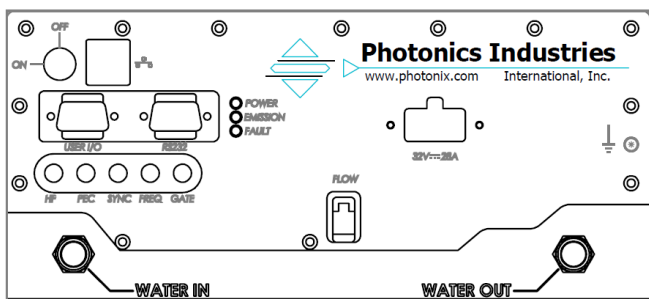
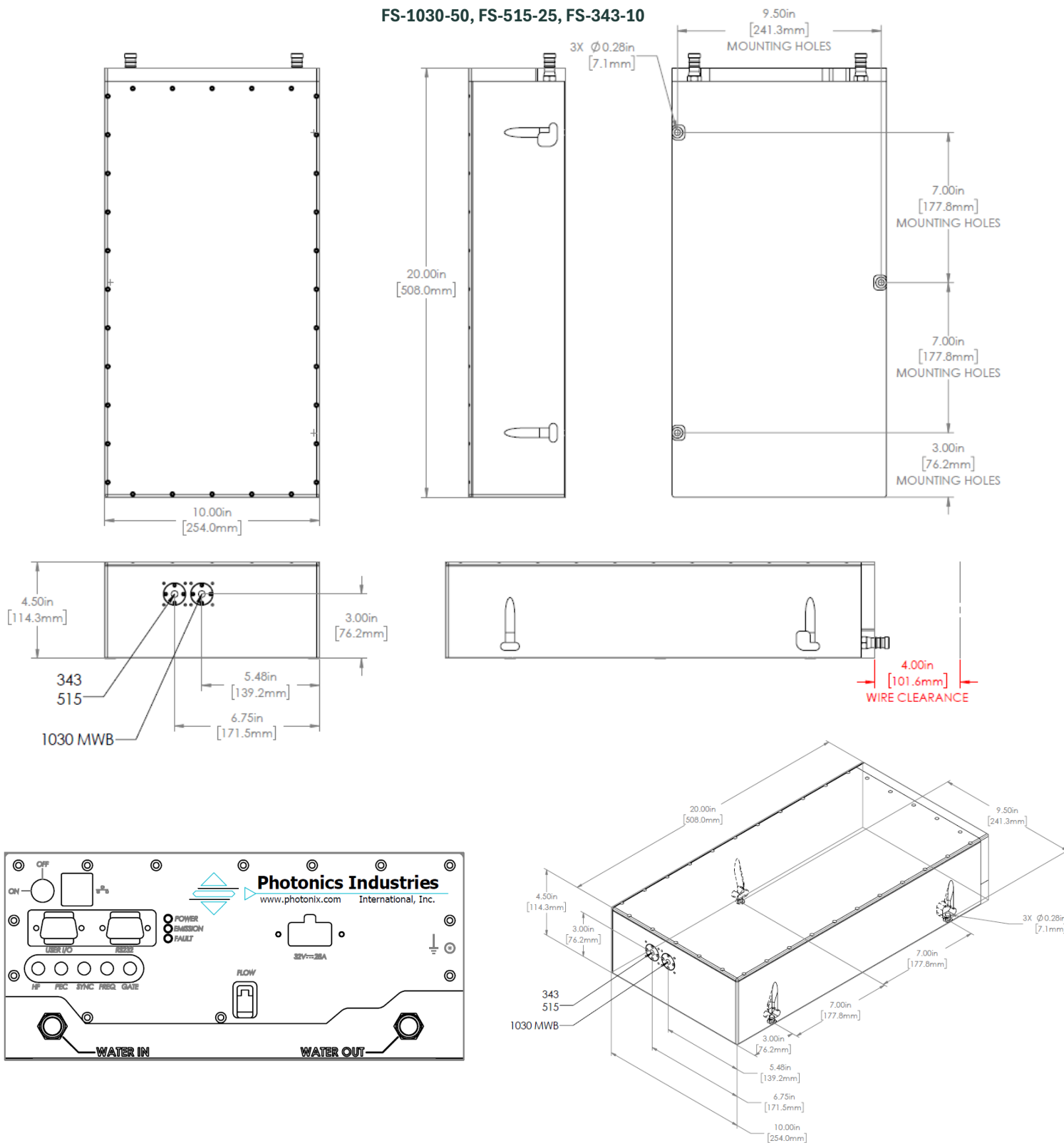
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Power Vs. PRF



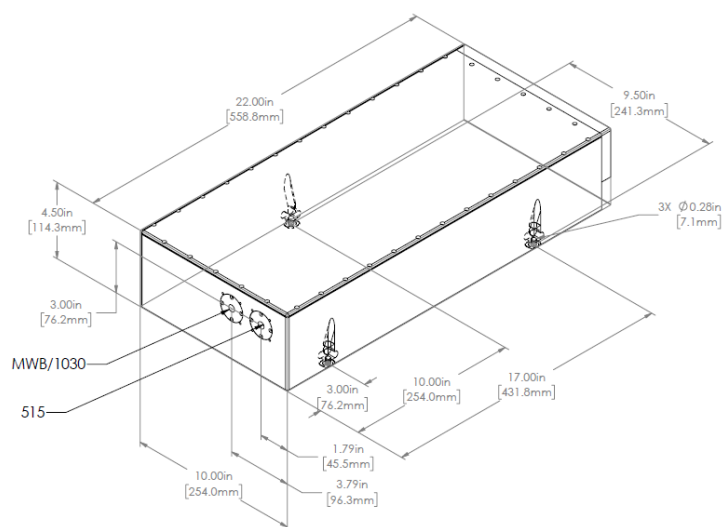
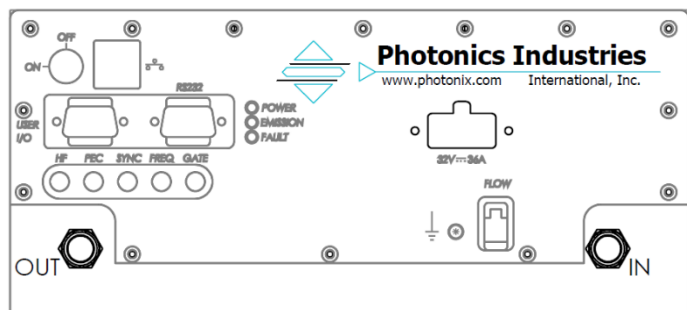
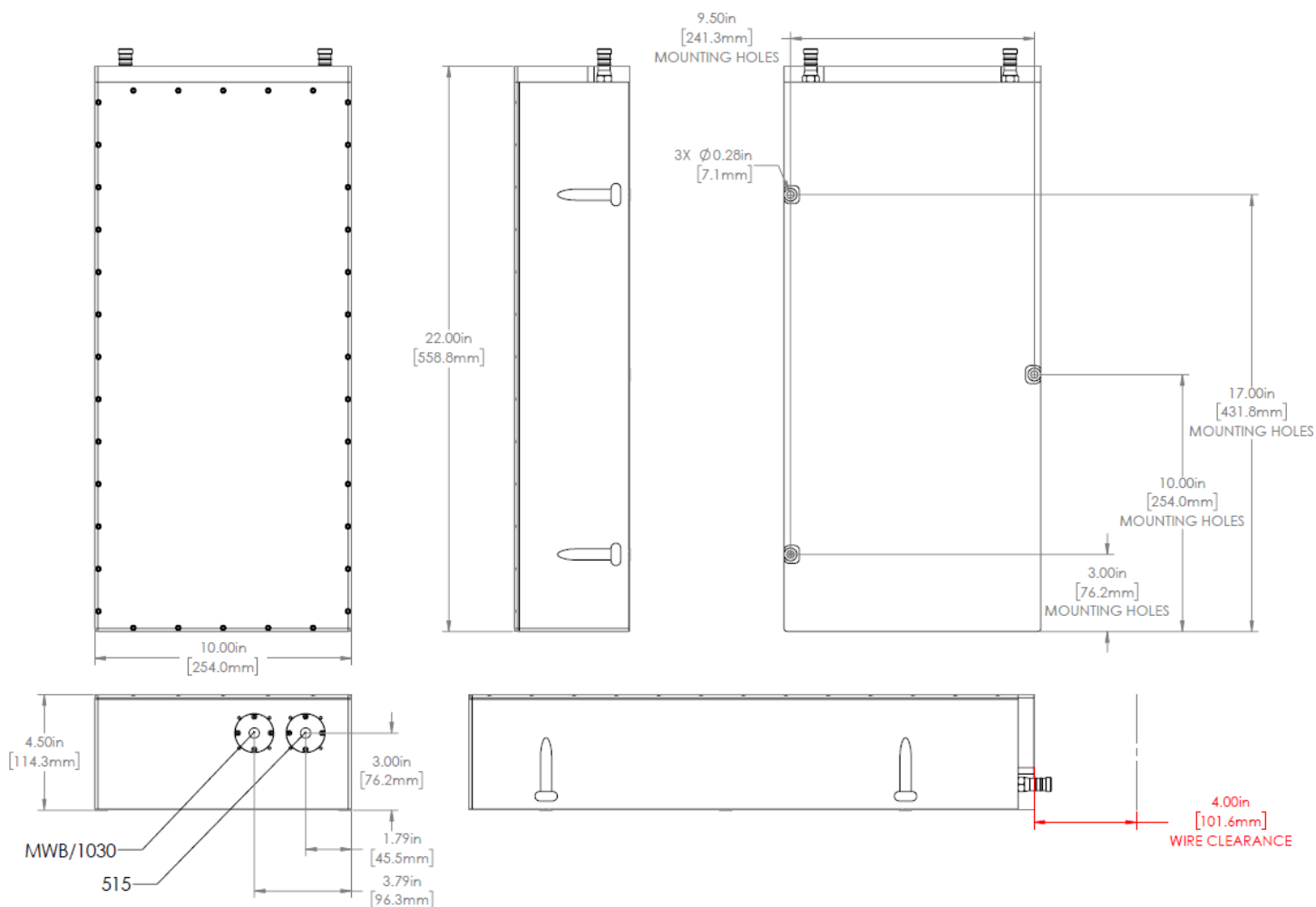
Dimensional Drawings

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



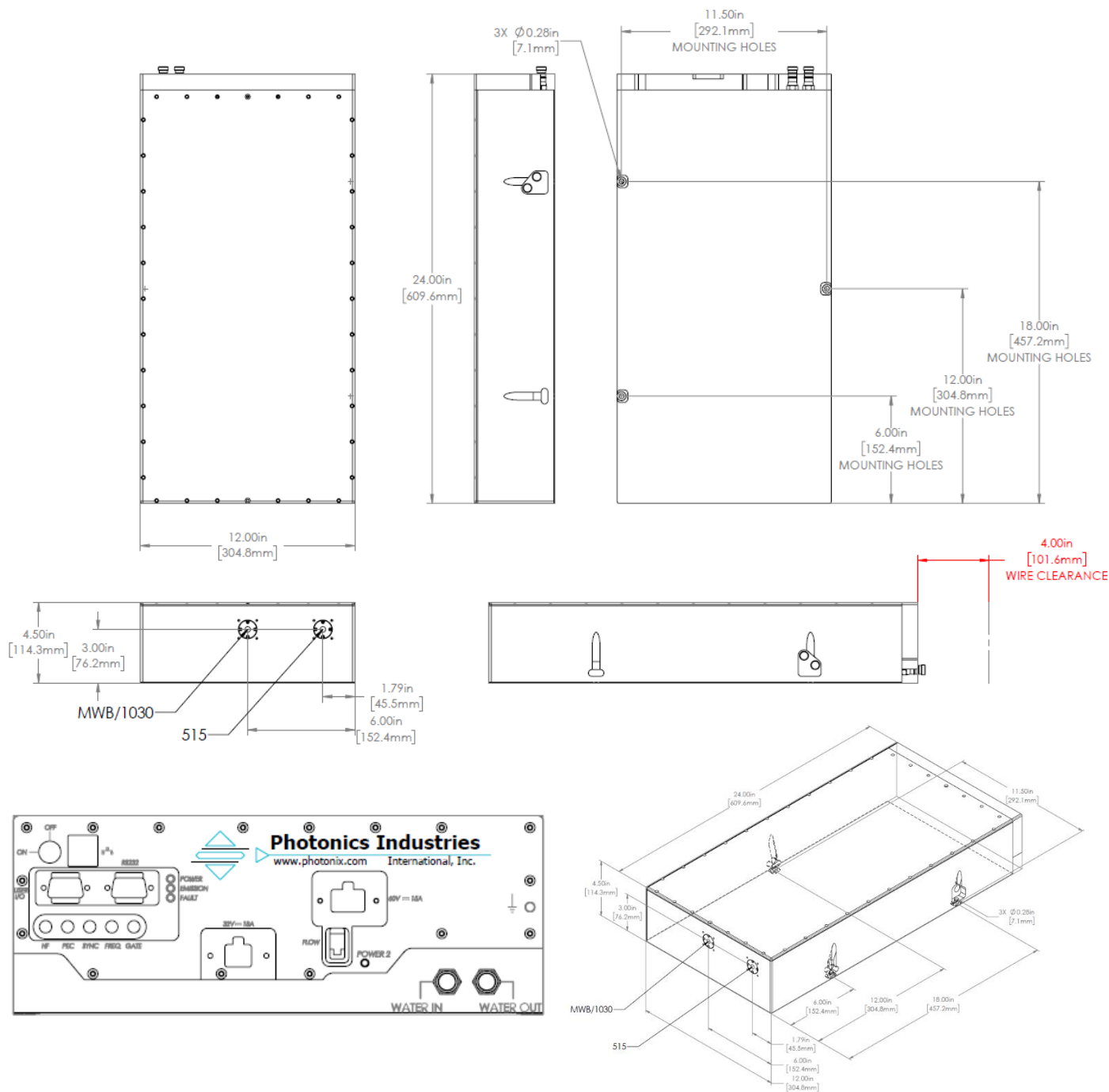
Dimensional Drawings

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



Dimensional Drawings

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



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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



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

