Technical specification of GHz burst repetition rate femtosecond laser

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|  | **The subject of the procurement** | **GHz burst repetition rate femtosecond laser** |
| Following tasks to be realized with galvanometric scanning system | * High-precision laser micromachining and volumetric modifications in transparent materials.
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| * Ready for 24/7 operation
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| * The system should generate 1030 nm output beam with possibilities of second (2H), third (3H), and fourth (4H) harmonic generations
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| * Adjustable burst mode up to GHz region for applications such as selective ablation, deep engraving, surface polishing, and functionalization
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| * Adjustable pulse repetition rate and pulse duration to optimize for different materials and processes.
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| * Compatible with Direct Machining Control system
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| * Integration with existing galvanometric scanning systems and RTC control boards.
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| **Technical features of GHz burst repetition rate femtosecond laser** |
| Optical Characteristics | *- Wavelengths:** *Fundamental: 1030 nm*
* *Second harmonic (2H): 515 nm*
* *Third harmonic (3H): 343 nm*
* *Fourth harmonic (4H): 257 nm*

*- Pulse Repetition Rate: must be adjustable up to 2 MHz, with burst mode options up to GHz region**- Pulse Duration: Must be tunable tunable at least in the range of 250 fs and 1 ps.**- Output Power: Maximum output power of at least 120W at 1030 nm with > 50% efficiency for the second harmonic and > 20% for the third harmonic.**- Burst Mode Capability: Must support burst mode with both nanosecond and picosecond pulse separation, configurable to create a set of pulse sub-packets for enhanced control in material processing.**- Beam Quality (M²): Must be lower than 1.2.**- Polarization: Must be vertical for the fundamental wavelength* |
| Performance and Stability | - *Power Stability*: Output power stability should be within 1% over 8 hours of continuous operation.- *Pulse Energy Stability*: Stability of pulse energy must be <0.5% (RMS). |
| Control and Interfaces | - Must be compatible with analog, TTL, and Ethernet-based controls.- The system should provide interfaces for external synchronization and control, supporting flexible repetition rate tuning and burst shaping - Must be supplied with control software that allows adjustment of pulse repetition rates, burst configurations, and harmonic switching. |
| Accessories | - Delivery with all necessary cables, connectors, and manuals in English.- The system must include all necessary optical components for harmonic generation (2H, 3H, 4H) and mounting fixtures.Include power supply, cabling, and other connectors required for operation. |