Sr. No.	Specifications	
1.	1000W Fiber laser with field detachable and field replaceable fiber delivery cable ( in field) having QBH connectors	
	Laser Emitting wavelength Output Power Power Stability Max. Repetition Rate Max. Pulse Width Polarization Mode of operation Wall Plug Efficiency <b>Delivery Fiber Specification</b>	1060 - 1100 nm ≥ 1000W (maximum) <1 % 5000 Hz 50 μ sec Unpolarized, < 10% DOP CM as well as pulsed ≤ 30%
	Fiber Core Size NA Beam Parameter Products Connector Maximum Bend Radius( Static) Maximum Bend Radius( Dynamic) Length	50 μ m 0.2 < 5 mm mrad Standard QBH at both end, interlock 100mm 200 mm 20 meter
Laser Mechanical Specification		
	Laser Dimension Laser Weight	Less than 575 mm (L) x 390 mm (W) x 1020 (D) Less than 95 Kg
	Electrical Input Specification (Not Including Chiller)	
	Operating Voltage Frequency Max. Current Draw	208 or 380-490 VAC, 3-Phase 50Hz Each line, 15A
	Cooling Specification	
	DI Cooling Loop Flow Pressure Drop Temperature	8 l/min < 4 Bar 25° ± 10 C
	Flow Temperature	8 l/min 25° ± 10 C

	Environmental Specification :		
	Operating Temperature Storage Temperature Operating Humidity	15 to 35° C -15 to 65° C 10 to 90 % , non-condensing	
	Interface for Laser		
	The fiber laser should be controlled by control box for independent operation. Also the system should be controlled using external analog and digital signals. RS485 serial communication is used for controlling and monitoring the laser via MODBUS interface.		
	The following safety features must be incorporated in the system:		
	<ul> <li>Protective Housing</li> <li>Visible Emission Indicator (with 5 second delay)</li> <li>Remote Interlock</li> <li>Master Key Actuation Switch</li> <li>Manual Reset Mechanism</li> <li>CDRH and OSHA complaint</li> <li>Safety Interlocks</li> <li>Fiber Interlocks</li> </ul>		
2	Dual Loop Laser Chiller Unit Specification		
	Cooling Capacity Coolant Capacity( reservoir) Coolant Flow	< 3.3 KW De-Ionized (DI) Water ~ 25 1 12 1/min	
	Electrical input Max. Current consumption	400VAC ± 10% < 5.5 A	

## **Other Technical Requirement:**

- <u>The laser should be **field serviceable**</u>.
- The fiber delivery must <u>be **field detachable and field replaceable**</u> with industrial standard QBH-connector at both ends.
- The laser should be capable of processing <u>highly reflective materials like Cooper, Brass</u> and Al and supplier should give warranty of laser while processing these materials.
- The supplier must have trained service engineers for offered laser system for local Service support and their training certificate must be included along with technical bid for offered model.

- The laser design should <u>be modular to allow field repair by simply swap one of the few</u> modules (pump module, combiner module, active fiber module, controller unit).
- The laser diode bar should be with micro-optics pump engine design <u>to eliminate</u> <u>numerous fiber splicing from the single emitter</u>, which enables the field service <u>capability by simple optical alignment</u>.
- The supplier must give the reference list of their customer/user including reputed government organization, institution and industrial customers.
- The process interlock and system interlock timing signal information should also be attached with offer.
- Supplier must provide one year standard warranty for offered system.
- The supplier should be able to demonstrate the laser in operation at the time of installation at our site and laser parameters such as power, frequency, and pulse width should be clearly shown during the same time.
- The offered system should be compatible with all industrial scale processing heads.
- The offered laser system must be <u>vertically integrated system</u>, where all components <u>are manufactured by same manufacturer</u>.
- Supplier must provide the details of electrical inputs in their offer with approx. weight of laser system and requirement of base which the laser will be mounted is also required to be mentioned in offer.
- Full service backup including repairing/reconditioning of the laser and chilling system should be available at least 10 years from the date of installation of laser system.
- The laser designed should be suitable for additive metal manufacturing <u>applications such as laser cladding, heat treatment, 3-D printing as well as cutting</u> and welding.