Technical specifications for the Nd:YAG laser

A Q-switched Nd:YAG laser with a maximum of 10Hz repetition rate is required with the following specifications.

1. Harmonics and their selection:

2^{nd}, 3^{rd} and 4^{th} harmonics with necessary crystals and optics are required. The crystals should be housed in a temperature stabilized box (if possible, all crystals in a single box). Switching from 2^{nd} to 3^{rd} to 4^{th} harmonics should be simple without any further alignment. The fundamental beam should also be available independently for external use.

2. Pulse energy:

The energies of the fundamental and all the harmonics should be

$\geq$ 850mJ@1064nm (Fundamental) (A maximum of 1J only will be considered)
$\geq$ 400mJ@532nm (Doubled)
$\geq$ 200mJ@355nm (Tripled)
$\geq$ 100mJ@266nm (Quadrupled)

3. Power supply and cooling system:

220VAC@50Hz, single phase power supply to control the laser is preferred. A self contained heat exchanger with air cooling is highly preferred or else, necessary chiller system should be provided along with the Nd:YAG laser.

4. Flash lamps:

A maximum of two flash lamps should be used. Flash lamps should be easily replaceable without further alignment. The supplied flash lamps should have a lifetime upto a minimum of 20 million pulses. An additional set of spare flash lamps should be provided with the system.

5. Energy Attenuation:

The user should be able to change the energy of the output beam via varying the delay between the Q-switch and the flash lamp and not by adjusting the flash lamp's voltage. However, provision to increase/decrease the voltage of the flash lamps should be inbuilt in the system.

6. Repetition rate:

10Hz with programmable Q-switch for variable repetition rate of 1-10Hz, and single shot operation should be given.

7. Line width: $\approx 1 cm^{-1}$ @1064 nm

8. Pulse duration: 3-10 ns

9. Beam diameter: ≤ 10 mm

10. Energy stability: ± 2% or better @ 1064nm

11. Divergence: ≤ 0.5mrad

12. Beam pointing stability: < ± 50 μrads

13. Temporal jitter: ≤ 0.5ns

14.Interfacing: USB 2.0/RS-232 in the order of priority

15. Triggering:

Both internal and external triggering should be possible. Q-switch and flash lamp trigger options (in and out) should be included in the system.

16. General specifications:

a) Maintenance of the laser head should be easy (kinematic mechanism to remove and maintenance of the laser head will be highly preferred).

b) The Nd:YAG laser should have the facility to control all its parameters using an external laptop/PC. The necessary cables to do this should be supplied. The computer will be provided by us at the time of installation.

c) LabView drivers and necessary ASCII codes to control the laser externally should also be provided along with the laser's software. We should be able to control the laser parameters using LabView/third party software by integrating the provided LabView/ASCII drivers.

d) A minimum of two years warranty from the date of installation should be given for the entire system. An additional third year warranty should be given as an option.

e) The laser should be installed in our laboratory by a technical expert of either the manufacturer or the supplier. A complete training should be given on operation and maintenance of the laser.

f) The turning optics for all the harmonics should be provided with the laser. A minimum of four mirrors at each harmonic should be provided along with the appropriate opto-

mechanics. The threshold energy of the provided turning optics should be at least 5 J cm^{-2} or better as required.

g) If the power supply is a self contained heat exchanger with air cooling, at least two spares of necessary filters and the cartridges should be supplied. If a chiller is provided, all the necessary fittings, valves etc. should be supplied.

h) All the necessary cables, power adapters and noise free BNC cables should be supplied with the laser.

i) At least two sets of safety glasses to work with the Nd:YAG laser at all the harmonics should be provided.

j) A list of references in India, where similar systems have been installed, **must be provided** and this will be taken very seriously while making the decision. **Your post sales service feedback will be certainly a deciding factor**.