

## **Specifications for high speed laser and camera for high speed Particle image velocimetry system (PIV)**

### I. Nd:YLF - 527 nm wavelength - dual cavity - double pulsed for PIV application

1. Repetition rate (kHz) : 0.2 to 10
2. Energy per cavity at 527 nm (mJ) :  $\geq 30$  @ 527 nm @ 1 kHz
3. Pulse width (ns) : 150 to 220 @ 1 kHz
4. Beam diameter or size (mm) : 3 to 8
5. Pointing stability ( $\mu$ rad) :  $\leq 25$  @ 527 nm
6. Beam divergence (mrad) :  $\leq 8$
7. Jitter (ns, rms) :  $\leq 0.5$
8. Beam profile : Gaussian/Top-hat
9. Pulse-to-pulse energy stability ( $\pm$  %) :  $< 1$  %
10. Power supply with integrated primary cooling unit. Please mention if laser requires external chiller
11. Power input : 220-250 VAC, 50 Hz
12. Operating temperature ( $^{\circ}$ C) : 15 to 35 $^{\circ}$ C
13. Operating relative humidity (%) : 8 to 80
14. Coolant : Distilled/Deionised water
15. External trigger control : 5v TTL for both Q-switch and Flash lamp input
16. Product warranty of 2 years and minimum 90 days on optics from the date of installation.
17. Test report should contain pulse energy measurement at 527 nm @ 1 kHz repetition rate for each cavity of the laser.
18. Installation and user training should be provided by the manufacturer or their authorized dealers
19. Do provide the list of customers with their contact details where similar system has been installed.

### II. High speed CMOS camera

1. Chip resolution :  $\geq 1280 \times 800$
2. Pixel size ( $\mu$ m) : 10 to 20
3. Frame rate (fps) :  $\geq 6000$  @ 1280  $\times$  800 pixel resolution
4. Repetition rate : up to 10 kHz, (10 kHz at reduced resolution)
5. Digital resolution (bit) : 12
6. Dynamic range :  $> 55$  dB
7. Read out noise at 30 $^{\circ}$ C :  $< 30 e^{-}$
8. Full well capacity :  $> 20000 e^{-}$
9. Internal memory (GB) : 16
10. Minimum exposure time ( $\mu$ s) :  $\leq 1$
11. Synchronization control : Internal or external clock with 5V TTL through BNC connection
12. Camera control interface : 10 GB Ethernet
13. Operating temperature : 15 to 35 $^{\circ}$ C
14. Operating relative humidity (%) : 8 to 80 %
15. Cooling : Internal fan cooling
16. Power input : 220-250 VAC, 50 Hz
17. F-mount and one inch C-mount adapters
18. Software to control, acquire and export the images
19. Product warranty of 2 years from the day of installation
20. Installation and user training should be provided by the manufacturer or their authorized dealers.
21. Do provide the list of customers with their contact details where similar system has been installed.