

**DEPARTMENT OF MECHANICAL ENGINEERING  
INDIAN INSTITUTE OF TECHNOLOGY DELHI  
HAUZ KHAS, NEW DELHI-110016 (INDIA)**

DATE: February 4, 2013

**NOTICE INVITING QUOTATION**

**NIQ No. IITD/VRL/AKD/2013-2**

DUE DATE: Feb 11, 2013, 11am

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Purpose: The purpose of advanced non-contact laser based angular velocity and angular displacement sensing equipment will be to accurately measure the angular / torsional vibrations of high speed rotating shafts.

**Technical Specifications for Torsional (Rotational) Laser Vibrometer:**

1. The system comprising of measuring optics and digital decoding electronics should have measurement bandwidth of at least 10kHz.
2. The system should give BNC Output ( $\pm 10$  V) for the analog signals to measure torsional (rotational) vibration velocity, angle and speed (rpm).
3. The laser unit comprising compact measurement head should enable torsional displacement, velocity and speed measurement on shafts operating upto to +20000 rpm or more.
4. Measurement range (angular velocity) should be at least 100000  $^{\circ}/s$  with a frequency range of 1 Hz to 10 kHz or better and the measurement range for angular displacement should be between 0.001 $^{\circ}$  to 10 $^{\circ}$  or better.
5. The sensor standoff distance should be more than 500mm to enable convenient use of the instrument from distance.
6. There should be a possibility of using the same setup for translational measurement without any additional hardware and software with BNC analog output ( $\pm 10$  V) for vibration velocity up to 2m/s with a bandwidth of 0.5 Hz – 20 kHz and displacement measurement.
7. Measurement error: not more than 1% at 1kHz; Calibration error: not more than 0.3%
8. The system should allow convenient measurement with at least 3m long fiber optic cable and indicator for alignment of the measurement head to the center of the rotating shaft.
9. Noise emission: The entire system should not generate more than 70dB at 1m distance
10. The design should ensure protection of the optics for rugged industrial environment.
11. Laser Type Must be safe for human eye, Should comply the laser safety IEC/EN 60825-1:2003-10
12. Additional essential and optional accessories such as interconnecting cables, dust protection air nozzle, tripod, translating measurement, transportation case, etc. be specified and quoted.

13. Weight and Size Portable (Lighter and Smaller system is preferred); Footprint should be specified in the quote.
14. Quotation should include relevant and detailed data sheets and technical specifications of the product. The quote should enlist additional accessories, if applicable, as options priced separately.
15. The bids along with a very clear and unambiguous specifications-compliance sheet with reference the NIQ document should be submitted
16. Comprehensive warranty of at least 3 years.

Sealed quotations (two separate sealed and clearly marked "Technical" and "Price" bid envelopes placed together in a sealed cover envelope clearly mentioning "Quotation for Rotational/torsional vibrometer" with our NIQ reference marked on the top) should be submitted.

Sole agency certificate, proprietary certificate, etc. as applicable should be submitted with the quotation. The technical bid should accompany a list of such system supplied to reputed organizations in India from whom IITD can seek feedback on the performance of the product. Necessary information in respect of the Comprehensive Warranty, Delivery Period, and Installation & Demonstration at our premises are to be included.

#### **TERMS & CONDITIONS COVERING SUBMISSION OF QUOTATIONS**

- 1. DELIVERY:** Please quote the F.O.B. price, and indicate separately the C.I.F. charges (Air Freight), Delhi Airport
- 2. TERMS OF PAYMENT:** 100% through Letter of Credit. Please specify the name in whose favour the L/C to be opened, and 'payable at'
- 3. VALIDITY OF QUOTATIONS:** 90 days
- 4. CORRESPONDENCE:** No correspondence regarding acceptance/rejection of a quotation will be entertained.
- 5. SUBMISSION OF QUOTATIONS:** Quotations may please be sent to the address mentioned below
- 6. DISCOUNT/REBATES:** Special discount/rebate wherever admissible, keeping in view that the supplies are being made for Educational purpose in respect of a public institution, may please be indicated in the offer.
- 7. DIRECTORS RIGHTS:** Director, IIT Delhi reserves the right of acceptance or rejection of any or all quotations.

Sealed quotations may please be sent to on or before February 11, 2013 (11 am) to the following address:

Dr A K Darpe  
 Department of Mechanical Engineering  
 IIT Delhi, Hauz Khas, New Delhi – 110016