Civil Engineering Department

IIT Delhi, Hauz Khas, New Delhi -16

Sealed Quotations are invited in Indian Rupees (INR) **OR** USD/GBP from well known companies/distributers or their authorized representatives for supply of following equipment's conforming to technical specifications and prescribed terms & conditions as given hereunder. Interested parties are required to submit their quotations.

The bid should be addressed to Dr D R Kaushal and submitted in Department of Civil Engineering, IIT Delhi, Hauz Khas, New Delhi – 110016 latest **by 3:00 PM** on **January 31, 2013.**

S.No	**Product**	**Technical Description**
1	**Kaplan Turbine**	Must be a self-contained, small scale hydropower unit designed to demonstrate the operating principal of Propeller Turbine which is designed to be used in conjunction with Computer interfacing along with software. Must consist of a framework base which houses a 75 litre water reservoir and a circulating pump which produces 14m head at 4.4litres/second. **Instructional Capabilities:** Determining the turbine characteristics of a propeller turbine, including the relationships of volume flow rate, head, torque produced, power output and efficiency to rotational speed. **Specifications:** o Maximum Power should be 55W o Maximum Speed should be 8500rpm o Maximum Torque should be 0.60Nm • A stainless steel top must support the turbine itself and a dynamometer assembly. • The propeller must be housed in a clear acrylic pipe to allow maximum visibility of the workings. • The unit must incorporate a paddle wheel type flow meter and a pressure sensor to measure the inlet condition of the water. • The dynamometer module must incorporate a magnetic type brake which applies load to the turbine. The level of braking must be controlled directly from the software. • The unit must link to a PC via a USB interface. • A load cell must measure the braking force, and hence the power; and an optical sensor must measure the rotational speed of the turbine. • Must be supplied with full educational software package including comprehensive results processing and help facilities. • Dimensions should be: Height: 1.12m, Width: 0.91m, Depth: 0.66m.

2	**Computer Interface Unit with Software**	• A computer interface accessory for use with Turbine Units. • Connects to Turbine Units equipment sensors via a single multi-way connector. • Output with variable frequency for accurate motor speed control. • Sensor-less vector motor drive to measure motor torque. • Automatic slip compensation to maintain constant speed. • Secondary mains output, switched under software control. • Interface driver allows linking to other software packages. • Built-in watchdog circuitry for remote operation (with suitable equipment). Windows based software is supplied with the Turbine Units offering a complete teaching package of coursework and laboratory investigation. Easily explore the principles of each machine quickly and easily, highlighting the difference between theoretical and practical measurements. The software runs under Windows operating systems. Also: > Diagrammatic representation of the equipment, complete with real time display of the various sensor outputs > Presentation screens, giving an overview of the software, the equipment, the procedure and associated theory > Detailed 'Help' facilities giving in depth guidance > Automatic data logging of sensor values into a spread sheet format > Control over sampling intervals > Student questions and answers, including a layered 'Hint' facility > Processing of sampled values (this may be linked to the questions and answers to ensure student understanding) > Sophisticated graph plotting facilities of both measured and calculated values, including comparisons taken under different conditions > Export of data to Microsoft Excel or other spread sheets > Links to user defined word processor > Calibration facility for sensors > Real time bar graph display of sensor outputs > Recent history graphical display The analogue output data is digitized and transferred to a computer using the standard USB (Universal Serial Bus). This allows any standard modern Windows computer to be used, including notebooks, and does not require any internal access to the computer. The equipment is supplied complete with a USB lead for connection to the computer. The Turbine Demonstration Unit interfaces to the computer via Computer Interface device and the USB port of the computer. Also available is a software driver that allows the outputs to be read in other software programs, such as Labview.

Terms and Conditions:

1. The **Technical Bid** with detailed specifications and **Commercial Bid** for financial details should be in **two separate sealed envelopes,** put into one larger envelope. All envelops should bear the **title** of the item quoted and the content, failing which the quotation shall be rejected.
2. Vendor should attach a letter from the manufacturer/their product principal permitting to quote for this tender for authenticity of dealership/agency and the dealer should be an authorized service provider. Quotations without authorized service provider certificate will be rejected.

3. Vendor should get a certificate for this particular quote directly from their product principal clearly mentioning about two years on site comprehensive warranty of the equipment to be delivered. Vendor may also quote for third year additional warranty charges separately if any.
4. The Company/Manufacturer should be registered for ISO certificate. The Company/Vendor should attach a copy of the certificate.
5. The Vendor should have minimum annual turnover of Rs.10.0 crore and minimum experience for selling similar kind of equipment should be at least 3 years.
6. In case the items are proprietary products of the company, a proprietary item certificate stating the same may be provided.
7. Special discount/rebate wherever admissible keeping in view that the supplies are being made for educational purpose in respect of Public Institution of national importance may please be indicated.
8. Delivery period should be clearly mentioned.
9. Validity of the quotation should be at least 3 months.
10. Taxes, Terms and Conditions should be clearly mentioned.
11. In case of import of product, payment shall be made through L/C and the foreign bank charges for L/C will be borne by the beneficiary.
12. All prices quoted should be CIF Delhi.
13. Vendor should attach the relevant product brochure/leaflet for the model quoted.
14. Supplier/Vendors will do the installation of Equipment at IIT Delhi without any additional cost.
15. The power cables used for equipment supplied should be compatible as per Indian power supply standards i.e Single phase 220 - 240 Volts AC, 50Hz.
16. In case a Computer System is required for processing of observed data of the equipment to be supplied in that case Computer System would be made available by us. The price for computer system should not be included in the equipment's cost but the software for data transfer from the equipment should be compatible with Windows environment i.e All version of MS Windows 7 / Windows 8 Operating Systems.

Note: The institute/committee has the right to accept or reject any bid or all quotations without assigning any reasons whatsoever.