

TENDER INVITATION NOTICE

The tenders are invited for the following items (**Package No. TEQIP-II-1AMU03-11** entitled “**Pump and Turbine_MED**”) through “National Competitive Bidding” process of World Bank under TEQIP-II Project.

Item no.	Specifications	Quantity
<p>Centrifugal Pump and Pelton Turbine with ancillaries</p> <p>(a) Universal Dynamometer (b) Turbine Dynamometer (c) Pelton Wheel</p>	<p>A) Universal Dynamometer</p> <ul style="list-style-type: none"> • Electric motor with external speed and torque sensors, mounted onto a transportable base plate with handles • Includes a motor drive and display unit with digital displays of speed, torque and calculated mechanical (shaft) power • Has multiple outlets to provide power for other instruments supplied with the Fluid Power Modules, for a neater and safer arrangement • Trunnion bearings for repeatable and accurate torque readings • Direct drive – no belts or pulleys • Variable speed electric motor with industry-standard electronic drive control • Connects to Versatile Data Acquisition System (VDAS)[®] • Gives motive power and instrumentation • It has two parts: the Electric Dynamometer, and a Motor Drive and microprocessor controlled display Unit • Is an induction motor, trunnion-mounted to allow it to move freely against a strain gauge load cell. An inductive sensor measures the shaft speed. The load cell measures the shaft torque • Motor Drive and Display Unit - 450 mm x 350 mm x 340 mm • Electric Dynamometer - 410 mm x 350 mm x 280 mm • Rotor Diameter: 142 mm with 6 blades, material: aluminium • Aluminium pump housing • <i>Motor Power: 1.5 kW</i> • <i>Torque Measurement (in N.m):</i> Load cell and digital display • <i>Speed Measurement (in rev.min⁻¹):</i> Inductive sensor and digital display • <i>Shaft Power Measurement (in Watts)</i> Fundamental calculation from the speed and torque readings All parameters displayed on VDAS[®] <p>B) Centrifugal Pump Module</p> <ul style="list-style-type: none"> • Centrifugal pump mounted in a mobile frame with full instrumentation • Fully compatible with the Universal Dynamometer • Inlet and delivery valves for a wide range of operating conditions • Connection plate with schematic diagram clearly shows the water flow circuit and how the parts of the module connect to each other • Fully variable speed, for a range of test results • Includes Microprocessor controlled digital pressure display of pressure • Connect to the Versatile Data Acquisition System (VDAS)[®] • For use with and driven by the Universal Dynamometer • Includes a centrifugal pump, a venturi flowmeter, valves, a reservoir and instrumentation; • Fully variable speed • Centrifugal Pump is the power source for the Pelton Wheel, Francis turbine and Kaplan turbine • Self contained water circuit , 200 Litres • <i>Power: 1.5 kW (for Universal Dynamometer)</i> • <i>Maximum Pump Speed: 2800 rev.min⁻¹</i> • <i>Maximum Flow Rate: 4 L.s⁻¹ (nominal)</i> • <i>Maximum Delivery Pressure (head): 2.5 Bar (nominal)</i> <p>C) Turbine Dynamometer & Instrumentation</p> <ul style="list-style-type: none"> • A friction brake with electronic load cell 	<p>1 (ONE)</p>

- Maximum dissipation 300W
- Torque arm length: 75 mm
- Complete with microprocessor controlled display unit
- Connects to the Versatile Data Acquisition System (VDAS)[®]
- *Torque Measurement (in N.m):*
- Load cell and digital display
- *Speed Measurement (in rev.min⁻¹):*
- Inductive sensor and digital display
- *Shaft Power Measurement (in Watts)*
- Fundamental calculation from the speed and torque readings
- All parameters displayed on VDAS[®]
- Compatible with the Centrifugal Pump test set above
- Compatible with the Pelton Wheel, Francis turbine and Kaplan turbine
- Part of a modular fluid power test set

D) Turbine-Pelton Wheel

Maximum power output: 250W

16 buckets

Brake wheel diameter 150 mm to be compatible with the Turbine

Dynamometer above (to measure Torque, Speed and Power)

Stainless steel housing

Fully adjustable spear for water flow adjustment

Maximum delivery pressure:

2.5 Bar (nominal)

Instruments and measurements:

- Pressures: transducers and digital displays
- Flow: Venturi and differential pressure transducer

Nett dimensions and weight: 550 mm x 230 mm x 240 mm and 10 kg

Other features:

- Flexible inlet pipe with inlet pressure tapping.
- Variable Spear Jet - 16 turn adjustable control
- Maximum shaft power : Approximately 185 W

VDAS

- VDAS-F (frame-mounted version of the Versatile Data Acquisition System)

The VDAS[®] software has a comprehensive range of functions, including:

- Recording data automatically or with some manual input.
- Display of real-time data, either in digital form or as an analogue meter.
- Logging data for printing and later analysis.
- Exporting data for use by other software.
- Performing real-time calculations to generate user-defined data.
- Creating and printing charts and data tables.
- In addition, the high flexibility of the software enables

Computer connection:

- USB (lead included)

or

- RS232 D-Type 9-pin port (lead available separately)

Accessories (supplied):

- All mains connectors and cables
- STP leads for equipment connection

Compatible PC Operating Systems:

Microsoft[®] Windows 98SE[®], ME, NT(SP6), 2000 or XP

(Microsoft[®] Windows

XP is recommended)

<p>Compressible Nozzle Flow Apparatus</p>	<p>1. Nozzle pressure distribution in actual flow of compressible fluids in three nozzles with pressure measurement points: 1 convergent nozzle, 1 short and 1 long de Laval nozzle (all Brass) 2. Compressed air regulator for adjusting the pressure downstream of the nozzle - control .range: 0.8 to 6bar 3. Needle valve on the flow meter for adjusting the mass flow between 0.7 to 8.3g/s 4. Instruments: manometer/gauges (pressure: 2x 0.-10bar, 8x 1-9bar) and digital temperature display upstream and downstream of the nozzle (0-100°C) as well as rotameter</p>	<p>1 (ONE)</p>
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- Interested bidders may purchase the Bid Document for Rs. 500/- (Non-refundable) from the office of the Principal, ZHCET, AMU, Aligarh.
- The date of commencement of sale of bid document is 19.12.2012 time 10:00 hrs.
- The last date for sale of Bidding Document is 19.01.2013 time 11:00 hrs.
- The last date for receipt of bids is 19.01.2013 time 16:00 hrs.
- Rest of the details will be made available in the bid document.
- The Demand Draft of Rs. 500/- should be in favour of “MHRD/NPIU under TEQIP-II (Z.H.College of Engg. & Tech., AMU)”, payable at Aligarh, U.P.
- The bidder should have registration with Central Govt. Agency (as supplier) or must have DGS&D Registration.

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