

GOVERNMENT OF NATIONAL CAPITAL TERRITORY OF DELHI  
DELHI TECHNOLOGICAL UNIVERSITY  
(FORMERLY DELHI COLLEGE OF ENGINEERING) Ph. 27871018  
SHAHBAD DAULATPUR: BAWANA ROAD: DELHI-110 042

No. F. DTU/SP/211/01-03/16-17

Dated:

**NOTICE INVITING TENDER**

E- Tenders along with illustrated literature/leaflets for the supply/execution of item(s)/stores/work detailed below are invited from the Manufacturers or their Authorized Distributors only in two-bids system **(the bidder should be registered with the Delhi VAT Department and carry a valid Tax Identification Number issued by it to ensure that the delivery of goods is made from Delhi against a sale invoice issued from Delhi only)** through 'e' procurement solution only as per the guidelines and terms & conditions given in tender document - details of the NIT along with terms & conditions, specifications etc. can be seen/downloaded at/from the website.

The interested tenderers should upload duly signed tender form and their bids along with scanned copies of all the relevant certificates, documents etc. in support of their technical & price bids - all duly signed - on the: <https://govtprocurement.delhi.gov.in>. latest by **27/10/2016 up to 2.30 P.M.** An index prepared after pagination of all documents may also be uploaded. The technical bids will be opened online on **27/10/2016 at 3.00 P.M** {those bidders only whose original instrument of EMD amount is dropped in Tender Box placed in the office of Officer In-charge (S&P)} in the presence of the bidders who wish to be present and will also be displayed on the website. For participation in the tender through e-procurement solution, the tenderers are required to have digital certificate and get registered with application Service Provider NIC.

Tender document is also available for viewing on the website of Delhi Technological University, Delhi at [www.dtu.ac.in](http://www.dtu.ac.in)

Yours faithfully,

**EMD: Rs. 46,300/-**

Officer In-charge (S&P)

S.no.	DESCRIPTION	Qty.
01	Supply of Computerized CRDI VCR Programmable Open ECU & EGR Engine Test Setup (Compete Set;As per specification)	01 Set

Detailed specifications on next page...

## Tender Specifications:

### **COMPUTERIZED CRDI VCR PROGRAMMABLE OPEN ECU & EGR ENGINE TEST SETUP :**

The setup should consist of single cylinder, four stroke, CRDI VCR (Variable Compression Ratio) engine connected to eddy current dynamometer. It should be provided with necessary instruments for combustion pressure, crank-angle, airflow, fuel flow, temperatures and load measurements. These signals should interface to computer through high speed data acquisition device. The set up shall have a stand-alone panel box consisting of air box, twin fuel tank, manometer, fuel measuring unit, transmitters for air and fuel flow measurements, process indicator and piezo powering unit. Rotameter should be provided for engine cooling water flow measurement.

CRDI VCR engine shall work with programmable Open ECU for Diesel injection, fuel injector, common rail with rail pressure sensor and pressure regulating valve, crank position sensor, fuel pump and wiring harness. The setup should enable study of CRDI VCR engine performance with programmable ECU at different compression ratios and with different EGR.

Engine performance study should include brake power, indicated power, frictional power, BMEP, IMEP, brake thermal efficiency, indicated thermal efficiency, Mechanical efficiency, volumetric efficiency, specific fuel consumption, Air fuel ratio, heat balance and combustion analysis.

The set up should have the following features

- Performance optimization with Open ECU
- Tests at different CR and EGR
- Plotting of Torque and Power Curves
- Determination of Specific Fuel Consumption
- Determination of Volumetric Efficiency and Air – Fuel Ratio
- Determination of Mechanical Efficiency
- Determination of the Frictional Power
- Heat Balance Sheet
- Performance Test under different Load
- P  $\theta$  and PV Diagram
- Combustion analysis

Instrumentation:- Product should be supplied with best quality instruments. The components like Open ECU, Combustion pressure sensor ,Crank angle sensor, fuel flow transmitter, Pressure transmitter, high speed data acquisition device should be of MNC grades.

The Engine should be a **Single** cylinder four stroke, water cooled, modified to CRDI VCR Diesel Engine. It should be possible to change the compression ratio without stopping the engine and without altering the combustion chamber geometry by specially designed tilting cylinder block arrangement.

The set up should have the following Open ECU features:-

- Closed loop control for idle RPM
- Demand speed control
- Closed loop fuel pressure control
- Start control
- Pilot injection
- Separation control among pilot injection
- Injection timing control
- Engine Performance optimization

## Software

The software should be Labview based package developed for engine performance monitoring. It should serve most of the engine testing application needs including monitoring, reporting, data entry, data logging. The software should evaluates power, efficiencies, fuel consumption and heat release. Various graphs should be obtained at different operating condition. While on line testing of the engine in RUN mode necessary signals should be scanned, stored and presented in graph. Stored data file should be accessed to view the data graphical and tabular formats. The data in excel format should be used for further analysis

COMPONENTS DETAILS		
1.	Engine	Single cylinder, 4 stroke, water cooled, stroke 110 mm, bore 87.5 mm, 661 cc. Power 3.5 KW, 1500 rpm, CR range 12-18 modified CRDI VCR Engine
2.	Dynamometer	Eddy Current Type water cooled with loading unit of suitable capacity to test the engine at full load condition.
3.	Propeller shaft	with universal joints
4.	ECU cable	solenoid injector driver with programmable ECU software and Calibration
5.	Common rail	With pressure sensor and pressure regulating valve
6.	EGR	SS, Water cooled
7.	Injector	Type Solenoid driven
8.	Piezo sensor	Combustion: Range 350Bar with low noise cable
9.	Crank angle sensor	Resolution 1 Deg, Speed 5500 RPM with TDC pulse.
10.	Data acquisition device	NI USB-6210, 16-bit, 250kS/s.
11.	Temperature sensor	Type RTD, PT100 and Thermocouple, Type K
12.	Temperature transmitter	Type two wire, Input RTD PT100, Range 0–100 Deg C,
13.	transmitter	Output 4–20 mA and Type two wire, Input Thermocouple,
14.	Load sensor	Load cell, type strain gauge, range 0-50 Kg
15.	Fuel flow transmitter	DP transmitter, Range 0-500 mm WC
16.	Fuel tank	type: Duel compartment, with fuel metering pipe of glass
17.	Air flow transmitter	Pressure transmitter, Range (-) 250 mm WC
18.	Air box	M S fabricated with orifice meter and manometer
19.	Software	performance analysis software
20.	Rotameter	cooling 40-400 LPH
21.	Pump	Type Monoblock

NOTE: The following details must be submitted by the bidder with the technical bid:

1. Detailed technical specifications of CRDI VCR Engine Test Setup (Computerised)

2. Compliance Statement of technical specification.
3. Deviation Statement.
4. Detailed catalogues/literature etc.
5. Preference will be given to ISO certified suppliers

(TO BE SUBMITTED ALONG WITH TECHNICAL BID)

TENDER NOTIFICATION NO: -----

Phone No:- 27871018

UNDERTAKING

The Registrar,  
Delhi Technological University,  
Bawana Road,  
Delhi-110042

We the undersigned (herein after called as Contractor/Vendors/Suppliers) hereby offer to execute supply of items as per specification against which we have quoted over rates and for which this tender may be accepted at the rates stated there in and subject to the terms & conditions set forth for such items as may be ordered by the Registrar, Delhi Technological University or officer acting on his behalf.

Date this \_\_\_\_\_ Day of \_\_\_\_\_

Signature of Contractor \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## Guidelines/Procedure to be followed in introduction of 'e'-procurement solution:

**1. Payment of cost of Tender documents:** The collection of cost of Tender documents is dispensed away with, as there is no physical supply of tender documents and also to have absolute anonymity of bidder participating in e-procurement solution. The bidders can view/download the tender documents from the: <https://govtprocurement.delhi.gov.in>.

**2. Submission of bids:** The bidders who are desirous of participating in 'e'- procurement shall submit their price bids in the standard formats prescribed in the Tender documents, displayed at : <https://govtprocurement.delhi.gov.in>. The bidder should upload the scanned copies of all the relevant certificates, documents etc. in the: <https://govtprocurement.delhi.gov.in> in support of their price bids. The bidder shall sign on all the statements, documents, certificates, uploaded by him, owning responsibility for their correctness/authenticity and copies thereof may also be submitted in the office of the Officer In-charge (S&P), DTU along with original EMD before the specified date & time. In the event of the specified date for physical submission of EMD along with copies of bid documents is declared a holiday, the same will be received up to the appointed time on the very next working day. However, documents of the bidders downloaded online or requisitioned subsequently only will form the basis for deciding the tender.

**3. Payment of Bid Security (Earnest Money Deposit):** The EMD shall be in the form of the **DD/BG/Fixed Deposit Receipt only** of a scheduled bank issued in favour of Registrar, Delhi Technological University, Delhi and the zerox copy thereof is to be scanned and uploaded along with the bid, and the original shall be sent to DTU so as to reach before the date & time of closing of the bids; failing which bid will be rejected. The Bid Security (EMD) of unsuccessful bidders will be discharged immediately after finalization of the order/contract without any interest. However, firms registered with NSIC etc., are exempted from submitting EMD provided such registration includes the item(s) they are offering are manufactured by them and not for selling products manufactured by other companies.

**4. Price Bid Opening:** The Price Bids of only technically qualified bidders (whose bids satisfy the prescribed technical specifications/parameters and have also submitted all requisitioned documents & EMD) will be opened online at the specified date & time and will subsequently be evaluated to determine the lowest bidder. The result will be displayed on the: <https://govtprocurement.delhi.gov.in> which can be seen by all the bidders who participated in the tenders. There shall not be any negotiation normally. However, in exceptional cases, negotiations can be held with the lowest evaluated responsive bidder only. Counter offers tantamount to negotiations and shall be treated at par with negotiations.

**5. Processing of Tenders:** The concerned officer/officers will evaluate and process the tenders as done in the conventional tenders and will communicate the decision to the bidder online.

**6. Payment of Performance Security:** The successful tenderer shall furnish a Bank Guarantee/FDR of the value of 05% of the basic cost of the item for a period of 14 months beyond the warranty period from a nationalized bank to ensure the satisfactory performance of item supplied. The performance guarantee is to be submitted at the time of installation / demonstration of equipments. In case the performance of the item is not found satisfactory, the amount of Performance Security will be forfeited & credited in university account.

**7. Participation of Bidders at the time of opening of bids:** Bidders have two options to participate in tendering process at the time of opening of Bids:

- (i). Bidders can come at the place of opening of bids (electronically) as done in the conventional tender process.
- (ii). Bidders can visualize the process online.

**8. Participation Financial Rules for e-procurement:** The e-procurement system would be applicable for purchase of goods, outsourcing of services and execution of work as prescribed in GFRs.

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DELHI TECHNOLOGICAL UNIVERSITY,  
SHAHBAD DAULATPUR, BAWANA ROAD, DELHI - 110 042

## TERMS AND CONDITIONS

Procedure for submission of bids: The bidders who are desirous of participating in 'e'- procurement shall submit their technical and price bids in the standard formats prescribed in the Tender documents, displayed at: <https://govtprocurement.delhi.gov.in>. The bidder should upload the scanned copies of all the relevant certificates, documents etc. after page-numbering all documents and tender document and prepare an index thereof in the: <https://govtprocurement.delhi.gov.in>. in support of their price bids. The bidder shall sign on all the statements, documents, certificates, uploaded by him, owning responsibility for their correctness/authenticity and copies thereof may also be submitted in the office of the Officer In-charge (S&P), DTU along with original EMD. However, documents of the bidders downloaded online or requisitioned subsequently only will form the basis for deciding the tender.

1. Manufacturers (OEMs) or their Authorized Distributors/Suppliers / Agents/Channel Partners only should submit their bids.
2. ALTERATION IN THE SPECIFICATION.
  - (i) The specifications mentioned/issued with this form of tender must not be altered by the Suppliers.
3. INCOMPLETE TENDERS
4. The Bidder is expected to examine all instructions, forms, terms and specifications in the bidding documents. Failure to furnish all information/documents, as asked for in the NIT, or submission of a bid not substantially responsive to the NIT in every respect, will be at the Bidder's risk and may result in rejection of its bid.
5. CANCELLATION OF TENDER/ CONTRACT/ IN PART OR IN FULL IN CASE OF DEFAULT IN CONTRACT/SUPPLY:

If the Supplier, in the opinion of the Institute, fails or neglects to comply with any of the terms & conditions forming, part of the order issued, the head of institute shall without prejudice to any other right or remedies under the contract, has the right to cancel the contract /order by giving 15 days notice in writing to the Suppliers/firms without being liable to pay compensation for such cancellation.
6. Tender shall be uploaded as per guidelines indicated for e-procurement solution.
7. Demonstration of equipments has to be arranged by the suppliers, if desired by the institute. The technical committee may visit production facility if so desired for sample verification.
8. **The quotation should be valid for a period of one year from the date of opening of the tender.**
9. Rates are to be quoted in INR (Rupee terms) only and any revision thereof is not allowed after the tenders have been opened.
10. The delivery period should be clearly mentioned against each item, incase, the items are not readily available, ex-stock offer will be preferred.
11. Rates should be quoted F.O.R Institution. Taxes and Duties namely Sales tax/VAT/Custom Duty (against Custom Duty Exemption Certificate)/Excise Duty should be mentioned clearly.
12. Consignment will not be insured at the Institute/University Cost.
13. **Bidder, if is not the Original Equipment Manufacturer (OEM), must submit OEM's or their Distributor's Authorization to quote/sell the product(s).** Preference will be given to quotation pertaining to indigenous products. However, where suitable substitutes are not available and item need to be imported the following clarification/information should be given.
  - o Whether the item will be imported by the intended tenderers against its own import license or university will have to provide Custom Duty Exemption Certificate (CDEC).
  - o Name and address of the foreign supplier, make & model of the offered product and authorization to sell from OEM or their Distributor/ Authorized Chanel Partner.
  - o Delivery period including information about mode of dispatch and possible duration (after dispatch) for receipt of item at the port.
  - o Whether the item required any special preparation for installation. In case yes, full details should be given regarding operation maintenance of the items.
  - o In case of costly/sophisticated items whether the tenderers will arrange any special training regarding operation / maintenance of the items.
  - o Nature of assurance for the supply of spares after the warranty period.

14. The payment will be made within 30 days after the successful demonstration/installation of the equipment and fulfilling of other obligations (like training etc., if any) as per the purchase/work order, against a Bill/Invoice; containing therein details of goods delivered/services performed. Rejected items/goods should also be removed within 30 days after which no responsibility will be accepted by University.
15. In the event of the item(s) being imported product(s), Custom Duty Exemption Certificate (CDEC) will be issued by the University on the written request of the supplier; who, in turn, will furnish copies of relevant Customs Related Documents namely Airways Bill, Packing List, TR-6 challan etc. along with Bill/Invoice.
16. Conditional quotations and/or incomplete quotations in any respect will be rejected.
17. In case you cannot quote for one or more of the items asked for in the tender the word "NOT QUOTED" (in the rate column) should be indicated.
18. The specification of the item quoted by the firm should confirm to the University specifications. Confirmation, in this respect should be specifically mentioned in the tender. Where the tenderer feels that the specification of the item not fully given or differ, from the specification of the item mentioned by the university, the exact specification of such item should be attached with the tender indicating the item quoted.
19. The Firm is required to link the University specifications with catalogues & leaflets/literature and also **mention Make and the Model for each item**. Detailed features, for compliance of specification should be provided on specification sheet & appropriate reference i.e. page no. & para of literature, leaflet wherefrom the relevant information has been checked, should be indicated.
20. **EARNEST MONEY:-** EMD should be attached with the technical bid. The EMD shall be in the form of the **DD/BG/Fixed Deposit Receipt** of a scheduled bank issued in favour of Registrar, Delhi Technological University, Delhi. Zerox copy thereof is to be scanned and uploaded along with the bid, and the original instruments shall be sent to DTU so as to reach before the date of closing of the bids. Failure to furnish the original instrument before the closing of the bid, will entail rejection of bid and blacklisting. **If the tenderer after acceptance of the tender refused to take up the purchase order, his Earnest Money will be forfeited.** Any tender received without / less Earnest Money deposit shall be summarily rejected.
21. The Purchase Order/Contract will be awarded to the successful Bidder whose bid has been determined to be responsive and has been determined to be the lowest evaluated bid, provided further the Bidder is determined to be qualified to execute the Order/Contract satisfactorily.
22. There shall not be any negotiation normally. However, in exceptional cases, negotiations can be held with the lowest evaluated responsive bidder only. Counter offers tantamount to negotiations and shall be treated at par with negotiations.
23. The Competent Authority reserves the right to reject any or all the tenders and annual the bidding process at any time prior to award of Contract, without assigning any reason, without thereby incurring any liability to the affected Bidder or Bidders, and his decision will be final.
24. The supplies shall have to be made within the period specified in the purchase order failing which the order shall be cancelled and the Earnest Money will be forfeited. However, in exceptional circumstance and, on written request, from the supplier/tenderer, extension of date for supply of the material will be considered. Extension in supply period is at the sole discretion of the competent authority.
25. Service manuals, wherever available/ required, should be provided along-with the Equipments.
26. The University reserves the right at the time of award of PO/Contract to increase or decrease the quantity of goods and services originally specified in the Schedule of Requirements without any change in unit price or other terms and conditions. Further, the quantities in the PO/Contract may be enhanced by 30% within the delivery period.
27. In the case of purchase of may items against one tender, which are not inter-dependent or where compatibility is not a consideration, comparison would be made on the basis of prices quoted by the firms for identifying the lowest quoting for each item.
28. **WARRANTY: All products must have a minimum of One Year Warranty.** A Warranty Certificate should invariably be supplied along with the item at the time of delivery. If after delivery, acceptance and installation and within the guarantee and warranty period, the operation or use of the goods proves to be unsatisfactory, the supplier shall rectify the defects, errors or omissions by repair or by partial or complete replacement on free of cost basis.



29. The Competent Authority reserves the right to levy liquidated damages up to 2% of the value of the order for delayed supply. If the supply is delayed beyond the extended period, the University reserves the right even to cancel the order and forfeit the EMD of the firm/ tenderer.
30. PERFORMANCE SECURITY DEPOSIT:- The successful tenderer shall furnish Performance Security Deposit of the value of 05% of the basic cost of the item in the shape of Bank Guarantee/FDR etc. from a nationalized bank pledged to Registrar, DTU, for a period of 14 months beyond the warrantee period to ensure the satisfactory performance of item supplied. The performance guarantee is to be submitted at the time of installation / demonstration of equipments. In case the performance of the item is not found satisfactory and/or the Supplier fails to complete its obligation under the contract/purchase order, the amount of Performance Security will be credited in University account.
31. DEFAULT: - In the event of default and unsatisfactory service of the contractor/Supplier firm, the DTU will be at liberty to repair/get the item serviced from other party at the cost of supplier/ contractor/ tenderer.
32. In case of software items, the suppliers should ensure that:-
  - o Legal software is supplied in original sealed pouches / P. K. T.
  - o A license agreement is enclosed with it.
  - o A registration card is available for software.
33. FAILURE AND TERMINATION: - If the Contractor / Supplier fails to deliver the stores or any installment thereof within the period fixed for such delivery or at any time repudiates the contract before the expiry of such period, DTU may without prejudice to the right of the purchaser recover damages for breach of the contract.
34. The technical & financial bids of only those bidders will be opened who fulfill the eligibility criteria and whose documents are found in order. If any of the date earmarked for opening of technical or financial bids happens to be a holiday, the bids will be opened on the very next working day.
35. Terms & conditions for Comprehensive Annual Maintenance Contract (CAMC) will be as per Annexure - 1.(N/A)
36. Notwithstanding the provisions relating to extension of time, penalty and cancellation of tender/contract for default, the vendor shall not be liable for forfeiture of its performance security/ liquidated damages or termination for default, if and to the extent that, its delay in performance or other failure to perform its obligations under the contract is the result of an event of Force Majeure (i.e. an event or situation beyond the control of the vendor that is not foreseeable, is unavoidable, and its origin is not due to negligence or lack of care on the part of the vendor; such as wars or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes etc.). If the performance in whole or in part or any obligation under the contract is prevented or delayed by any reason of force-majeure for a period exceeding 60 days, either party may at its option terminate the contract by sending a written notice without any financial repercussions on either side.
37. The contract can be extended on mutual agreement for another year.
38. For any query/clarification in r/o technical aspect of the enquiry, **HOD (Mechanical)** , DTU may be contacted.
39. Prof of VAT/Sale Tax Registration no. and VAT Return copy of fourth quarter for last three financial year date of tender.
40. PAN No(Copy PAN no. Attached )
41. P.Os Copies /rate having executed similar items/order copy with at least 03 financial year date of tender.
42. Authorization certificate from Original equipment Manufacturer (OEM) or their Distributor to quote/sell the product, in case the bidder is not the OEM.
43. Disputes, if any, arising out of this tender shall be subject to exclusive jurisdiction of Courts of Delhi/New Delhi only.

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CHECK LIST OF DOCUMENTS TO BE SENT WITH TECHNICAL BID.

S.No.	Particulars of documents	Page no.	No. of pages
1.	Proof of EMD (mention amount with instrument number and date)		
2.	Proof of PAN no. (mention no.....)		
3.	Proof of VAT/Sales Tax Registration No and VAT Return copy of fourth quarter ( January to March ) for last three financial year date of tender.		
4.	Brochure/Leaflets/Technical Information, including Make & Model, Imported/Indian of the item(s)		
5.	UNDERTAKING as per page no. 05 of Tender Document, duly signed.		
6.	Technical specifications, terms & conditions and delivery period etc. to be submitted on firm's letter head		
7.	Warranty Certificate from manufacturer or authorized dealer of manufacturer		
8.	P.Os Copies having executed similar items/order copy only With at least 3 financial years date of tender.( minimum one purchase order copy Per financial year )		
9.	Authorization Certificate from Original Equipment Manufacturer (OEM) or their Distributor to quote/sell the product, in case the bidder is not the OEM		
10.	Proof of ISO Certified		

Note: All copies of above documents should be duly signed and stamped by the tenderer before uploading.

Signature of tenderer: .....  
 Name: .....  
 Name of firm: .....  
 Telephone No.....

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S.No.	Particulars of documents	No. of pages

**Pagination must be completed properly .**