NATIONAL INSTITUTE OF TECHNOLOGY

TIRUCHIRAPPALLI – 620015

DEPARTMENT OF MECHANICAL ENGINEERING

Web: www.nitt.edu Phone: 0431 – 2503401, 2503423

TENDER DOCUMENT

Tender Notification No.: Rc.No .RA/Thermal LAB/ Engine and Auxiliaries /Plan/2012

Dated: 01.05.2012

Name of the Items	1. Compact Electronic EGR setup 2. Electronic variable Diesel injection timing kit 3. LPG manifold injection system 4. Single cylinder water cooled diesel engine with eddy current dynamometer
Quantity Required	01
Delivery	Within two weeks from the date of purchase order delivery
Last Date of submission of quotation	**09.05.12** up to 3.00 p.m.
Date of opening of quotation	**09.05.12** up to 3.30 p.m.

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NOTICE INVITING QUOTATION

The National Institute of Technology, Tiruchirappalli (NITT) is an autonomous body under MHRD, Government of India, University, imparting Technical Education and engaged in Research Activities. It is proposed to procure the following equipment for the departmental academic/research activities.

Sealed quotations are invited for the following equipment subject to the following terms and conditions, from the reputed manufacturers or their authorized dealers so as to reach this office on or before scheduled date and time. The Quotations will be opened on the same day in the presence of the Registrar.

Requirement

Name of the Equipment: **Compact Electronic EGR setup**

Name of the Equipment: **Electronic variable Diesel injection timing kit**

Name of the Equipment: **LPG manifold injection system**

Name of the Equipment: **Single cylinder water cooled diesel engine with eddy current dynamometer**

1. Name of the Equipment: Compact Electronic EGR setup

Specifications:

The Exhaust Gas Re-circulation system should be a compact and should be controlled from computer. The Exhaust Gas Re-circulation should have the facility to set the percentage of EGR and the assigned percent should be maintained on various engine load conditions.

The Exhaust Gas Re-circulation should consists the below mentioned components.

SL. No	Description	Descriptions
1	Surge Tank	Size: Square (Size: 500mm X 500mm) Material: Mild Steel
2	Stainless Steel EGR Cooler	Shell and tube heat exchanger and suitable Mild steel piping Minimum temperature: 50ºC
3	Control Valve	0-100% Flow rate
4	Power Supply	230 V
6	Mounting Frame & Connecting Hose	Suitable Mounting Frame & Connecting Hose has to be provided for to mount in any kind of engine
7	EGR Valve	Micro controller based control valve with EGR software

2. Name of the Equipment : Electronic variable Diesel injection timing kit

Specifications:

Electronic variable diesel injection timing kit should be portable which can be fitted on any single cylinder Diesel Engine. The kit should have the full flexibility to change the below mention parameters in real time from the computer. The Electronic variable diesel injection timing kit should include the below mentioned Components.

<table>
<tr><th>Parameters</th><th>Descriptions</th></tr>
<tr><td>Start Angle of injection</td><td>Should be variable from 0 to 720^{o} CA</td></tr>
<tr><td>Multiple injection</td><td>Should be capable of doing below mentioned parameters
<table>
<tr><th>Type of injection</th><th>Selectable</th><th>Variable injection duration and start angle</th></tr>
<tr><td>Pilot1</td><td>Yes</td><td>Yes</td></tr>
<tr><td>Pilot2</td><td>Yes</td><td>Yes</td></tr>
<tr><td>Main</td><td>Yes</td><td>Yes</td></tr>
<tr><td>Post</td><td>Yes</td><td>Yes</td></tr>
</table></td></tr>
<tr><td>Injection Pressure</td><td>100 to 1000 Bar depending upon the engine load condition</td></tr>
<tr><td>Fuel tank</td><td>Mild steel fuel tank with capacity of 5 litres</td></tr>
<tr><td>Fuel Filter</td><td>Standard type fuel filter between the pre-suction pump and high pressure pump, removes dirt and contaminants from fuel before it is delivered to the high pressure pump.</td></tr>
<tr><td>Pre-supply Fuel Pump</td><td>The pre-supply is electric driven pump. A nylon filter is provided at the suction of the pre-supply pump.</td></tr>
<tr><td>Connecting pipe for pre-supply fuel pump, Connecting pipe for pump to fuel rail and Connecting pipe for fuel rail to Injector</td><td>Standard stainless steel based pipings to connect pre-supply fuel pump, pump to fuel rail and fuel rail to Injector</td></tr>
<tr><td>High Pressure Pump</td><td>500 bar maximum</td></tr>
<tr><td>Pressure Control Valve</td><td>Solenoid valve at a frequency of 1 kHz.
Internal spring pressure 100 Bar.</td></tr>
<tr><td>Fuel Pressure Sensor</td><td>Piezo electric based sensor up to 1000 bar</td></tr>
<tr><td>Injector</td><td>common rail injector with hydraulic servo/electromagnetic system to operate, ECU based injector control unit with variable diesel injection software</td></tr>
<tr><td>Motor</td><td>5 HP Three phase, mounting stand for motor,</td></tr>
</table>

3. Name of the Equipment: LPG Manifold Injection System

LPG manifold injection system should be portable, which can be fitted on any single cylinder Diesel Engine. The System should have the full flexibility to change the below mention parameters in real time from the computer. LPG manifold injection system should include the below mentioned Components.

Specifications:

Parameters	**Descriptions**
Entry pipe fitting	Fitting for copper pipe carrying LPG from tank
Start angle of injection	Should be variable from 0 to 720^{o} CA (controlled from computer)
Injection Duration	Variable(controlled from computer)
LPG Filter	Component used to clean the LPG coming from tank
Solenoid Valve	Normally closed, has the function to intercept and stop the LPG flow.
Reducer heating system	To prevent the freezing of the LPG, a heating chamber, obtained on the reducer body, is connected to the engine water cooling circuit by two orientable fittings. The warm fluid laps base and walls of the chamber, heating them.
Reducer 1° Stage	Chamber that allow a reduction of pressure of the LPG
Outlet fitting	Fitting for copper pipe at the outlet of the reducer, to the engine
Outlet pressure regulation	Allows a manual regulation of the outlet pressure in order to meet the requirement of the different automotive engines.
Pressure relief valve	Valve with a retaining spring that allows the relief of the LPG in vapour phase from the reducer, in case of overpressure.
Injector	12 V
Crank Angle Sensor	Standard
ECU	Electronic Control Unit with adjustable start of injection and injection Duration
Fuel Measurement	Load cell with Indicator
Software	LPG Injection Software

4. Name of the Equipment : Single cylinder water cooled diesel engine with eddy current dynamometer

Engine	
Make	Kirloskar
No of Cylinder	Single
Cooling	Water Cooled
Fuel	Diesel
Speed	1500 rev/m
HP	5 HP
Starting	Crank Start
Lubrication	Forced
Dynamometer	
Type:	Eddy Current Dynamometer
Cooling	Air
Load Measurement method	Spring balance
Max Speed	2000 rev/m
HP	5 HP
Coupling Type	Direct Tyre
Load of Eddy Current Dynamometer	
Indication	Spring Balance
Air Tank	
Type	Square (Size: 500mm X 500mm)
Material of Construction	Mild Steel
Method of Measurements	
Air Flow	

Type/Description	Glass tube manometer
Fuel Flow	
Type/Description	Burette with stop watch
Engine Speed	
Type/Description	A non-contact PNP sensor is used to measure the engine RPM. A PNP sensor gives a pulse output for each revolution of the crankshaft. The frequency of the pulses is converted into voltage output and connected to the computer.
Range	0-9999 RPM
Water Flow	
Type/Description	Acrylic Body Rotameter
Range	10-100 LPH for Engine Jacket
Temperature	
Type/Description	Digital (Panel Mounted)
Range	0-999°C
Measurement of Temperatures at different points	
Type Range Indication Location	"K" 0-900ºC Digital Exhaust Smoke
Type Range Indication Location	"K" 0-300ºC Digital Water inlet from engine jacket
Type Range	"K" 0-300ºC

Indication Location	Digital Water outlet from engine jacket
Type Range Indication Location	"K" 0-300ºC Digital Ambient

1. The items to be used is strictly according to the specification and subject to test by the Institute/concerned authorities. It must be delivered and installed in good working condition.

2. The bidder should give details of their ***technical soundness and provide list of customers of previous supply of similar items to Universities, Institutes or Government Departments / Undertakings / public sectors with contact details***. The details of the agency/profile should be furnished along with the copy of all related documents.

3. ***Payment: No advance payment will be made***. Payment will be made only after the supply of the item in good and satisfactory condition and receipt of performance security by supplier. In case of imports, the payment will be made through LC after installation and performance security need to be submitted at the time of LC commitment.

4. Rate shall be inclusive of all taxes. The Institute is eligible for customs duty and excise duty exemption.

5. The sealed cover should be addressed to

The Director,
National Institute of Technology,
Tiruchirappalli – 620 015

The cover should be subscribed with the following details

1. **Kind Attention to Dr. R.Anand, Assistant Professors / Mechanical Engineering.**

2. **Quotation Notification No.**

3. **Date of Opening**

6. The clear specification, make, model range etc., of product shall be mentioned in the quotation.

7. Guarantee and Warrantee period should be specified.

8. Period required for the supply and installation of item should be specified.

9. The Director reserves the right to reject any or all the offers without assigning any reasons thereto.

10. Time for completion of supply after placing purchase order: Within Four Weeks

11. Last Date of submission of quotation: **09.05.12**

12. Place, Date and time of opening of Quotations

Date	: **09.05.12**
Time	: **3:30 PM**
Venue	: **Director Office**

13. **Note:** The Institute shall not be responsible for any postal delay about non-receipt / non delivery of the bids or due to wrong addressee.