**Engine combustion Air Conditioning and Management system**

There is a requirement for an Engine combustion Air Conditioning and Management system for engine test beds at IC Engines Lab, IIT Madras.The conditions of the intake air (temperature and humidity) have a definite impact on the operating behaviour of an internal combustion engine. Hence, this Engine combustion Air Conditioning and Management system should maintain the temperature and humidity of the air supplied to the internal combustion engine at standard conditions defined in the technical specifications below, irrespective of the ambient air conditions inside the test laboratory. It can be a stationary installation with flexible hose arrangement for its outlet air, as shown in Figure 1 below. The system should have the following specifications.

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| **Technical Specifications to be met** |
| Air flow rate at engine inlet (It should be possible to set the flow rate at any two intermediate values as well) | Maximum = 1000 kg/h |
| Minimum = 50 kg/h |
| Inlet air conditions | Chennai ambient conditions considering variations over a period of 5 years (latest). |
| Temperature of air at outlet | 25 deg.C+1 deg. C |
| Relative Humidity of air at outlet | 50% +5% RH |
| Pressure of air at outlet | 950 – 102 mbar |
| Humidity control | All sensors and actuators needed have to be provided in the system for humidity control. The controller for humidity alone will be provided by IIT Madras. |
| Temperature Control | Should be by circulation of chilled water which is to be also provided within the system and must be controlled using a three way valve. The complete controller/PLC including all the sensors and actuators needed for humidity control should be provided by the bidder |
| Mounting | The whole arrangement should be trolley mountable |
| Piping | All internal piping and holding tanks must be in SS. The conditioned air must be available through a flexible pipe. |

**Essential Requirements:**

1. Complete details of the technical aspects including all the valves, sensors, actuators, controllers, outputs and inputs needed for humidity control, size of components, ratings, make of important valves, motors, controllers, sensors should be provided.
2. The price breakup of important components and services has to be given.
3. The company should have done at least three customised air handling systems for reputed government or research labs in the past three years. Evidence to this effect has to be provided with important details.
4. The installation and commissioning should be completed within 4 weeks of the PO.
5. Last date for submission of detailed quotations including all the technical requirements and commercials: **04-10-2017.**

Intake Duct to Engine

Air from Intake Air Conditioning System

Open Connection

Flexible Hose

**Figure 1:** Schematic of Interface to Engine

Quotations have to be submitted to the following address:

*Prof. A. Ramesh*

*Internal Combustion Engines laboratory*

*Department of Mechanical Engineering*

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Last date for submission of quotations: **04-10-2017**