

NCCRD EQUIPMENT LIST

Optical automobile engine.

Description- Optical engine spray studies using alternative fuel such as bio diesel & emulsion



Ducom cylinder optical engine



Hand operated overhead travelling Crane



AVL transient fuel measurement system



GDI Engine



AVL Transient fuel measurement system

Optical gas turbine engine

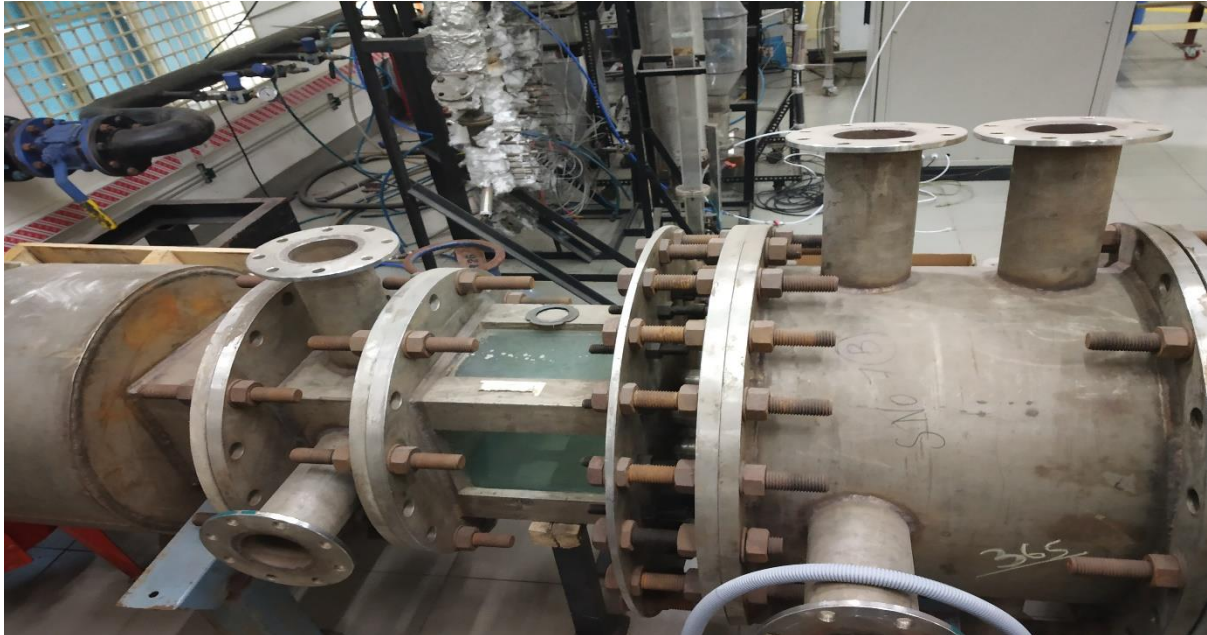
Description- Study spray at high pressure up to 10 bar.



Tec-Sol Spray rig 3A

High pressure spray testing rig

Description- Spray nozzle study at 10 Bar



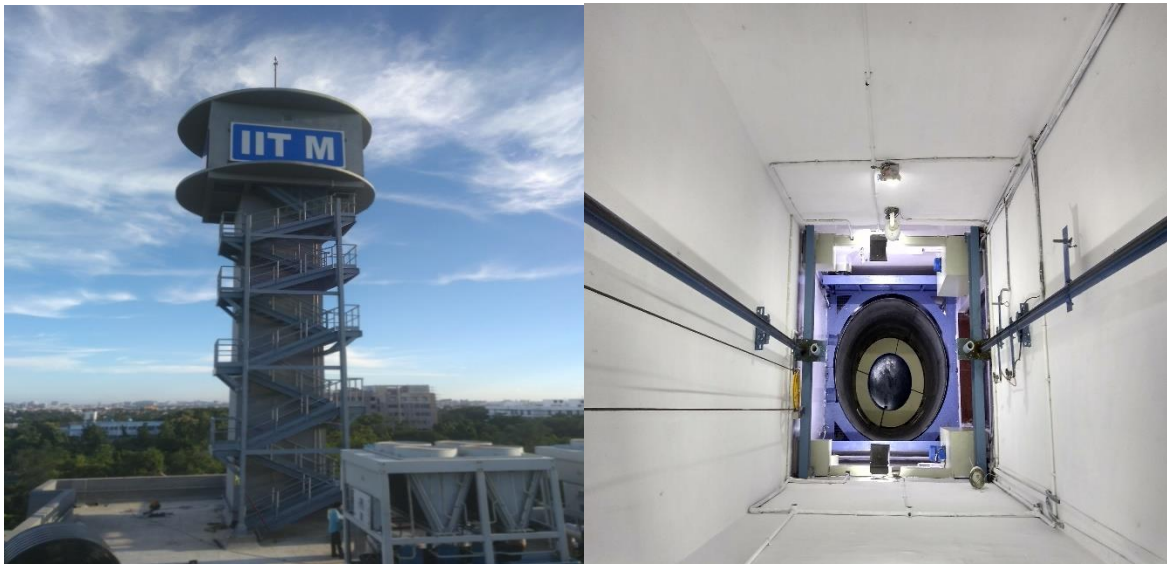
Supersonic combustor set up

Description- Study physics of supersonic combustion at Mach 2.5.



Drop tower for micro gravity

Description- Conduct experiments for short duration in microgravity.



Phase Doppler particle analyser (pdpa)

Description- To measure the particle size and three direction component velocity



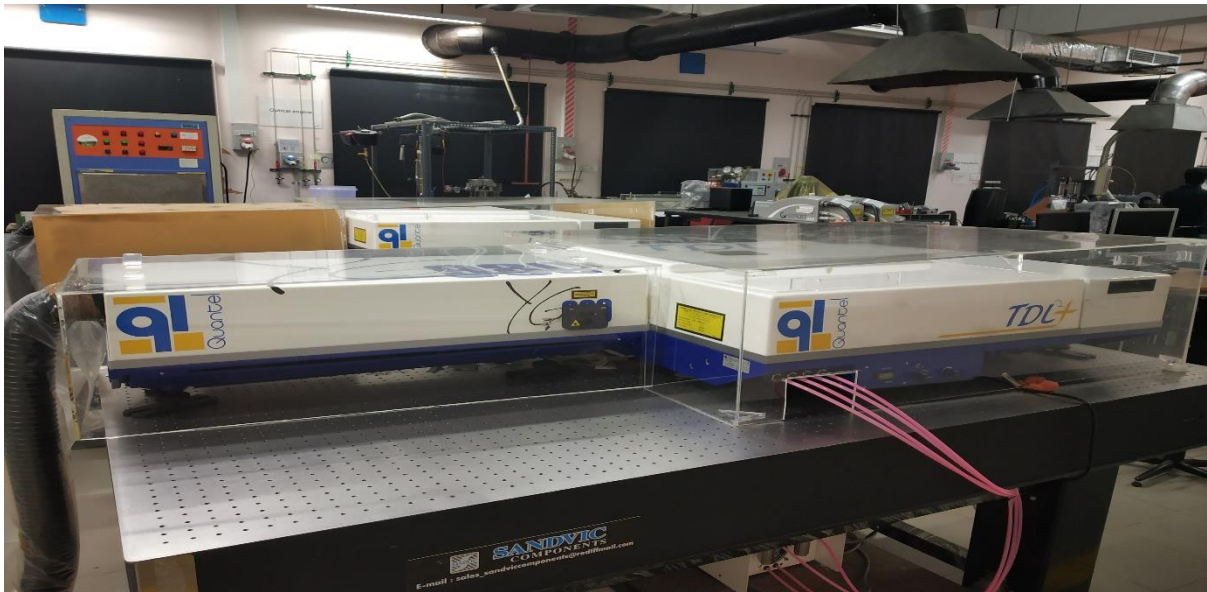
Spray/particle analyser based on Mie scattering

Description- Measure spray patterns of industrial spray nozzles (atomiser), droplet distribution & uniformity.



Time resolved planer laser

Description- For CH,OH,NO and similar radical based PLIF experiments for low speed (up to 10 Hz) imaging application.



High speed planar laser induced fluorescence system (HSPLIF)

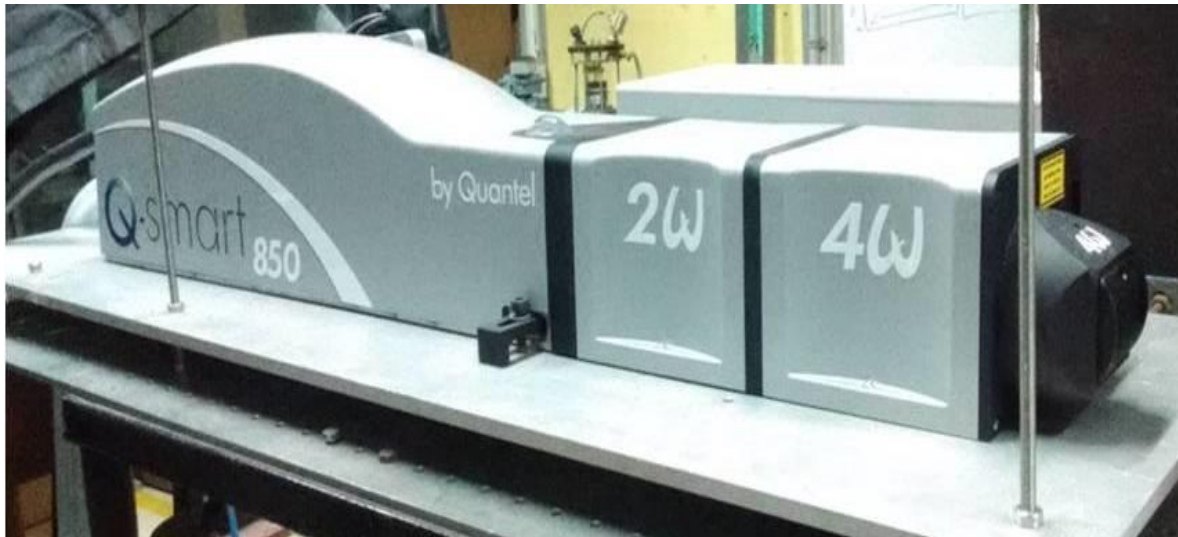
Two colour plif thermometry

Description- For CH,OH,NO and similar radical based PLIF experiments for low speed (up to 10 Hz) imaging application.



Laser induced incandescence (LII) set-up

Description- Pulsed Nd:YAG laser with separate detachable units for providing second, third, and fourth harmonic and a repetition rate of 10 Hz.



TDLAS set up induced laser

Description- Solid state Nd:YAG dual cavity pulsed laser having a maximum repetition rate of 15Hz with a output wavelength of 532nm and maximum energy of 145mj per pulse. Main applications of this laser includes low speed PIV and low speed imaging. Internal and external triggering / synchronization feature is available.



Spectrometer and accessories-2no.

Description- Wave meter is used for precise wave length measurement on laser beam, optical wave length of optical devices .They can be operated with very low light intensity coupled through an easy-to-use optical multi-mode fibre.



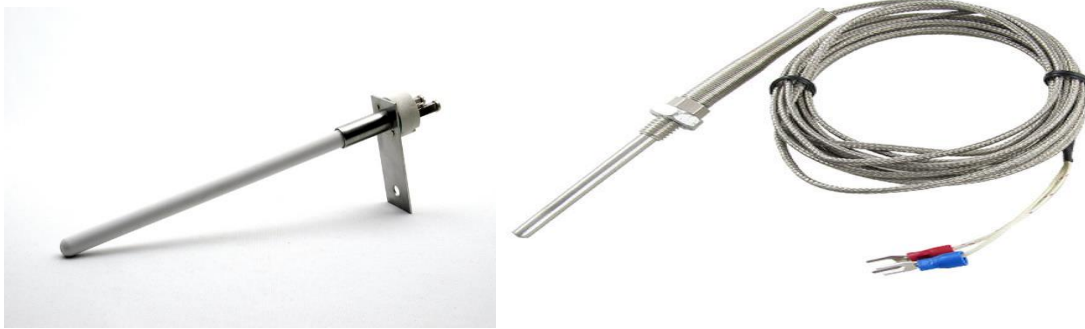
Online chromatography set up

Description- Identify the organic constituents in liquid samples/fuels, and quantify them



Thermocouples/thermal anemometer and accessories.

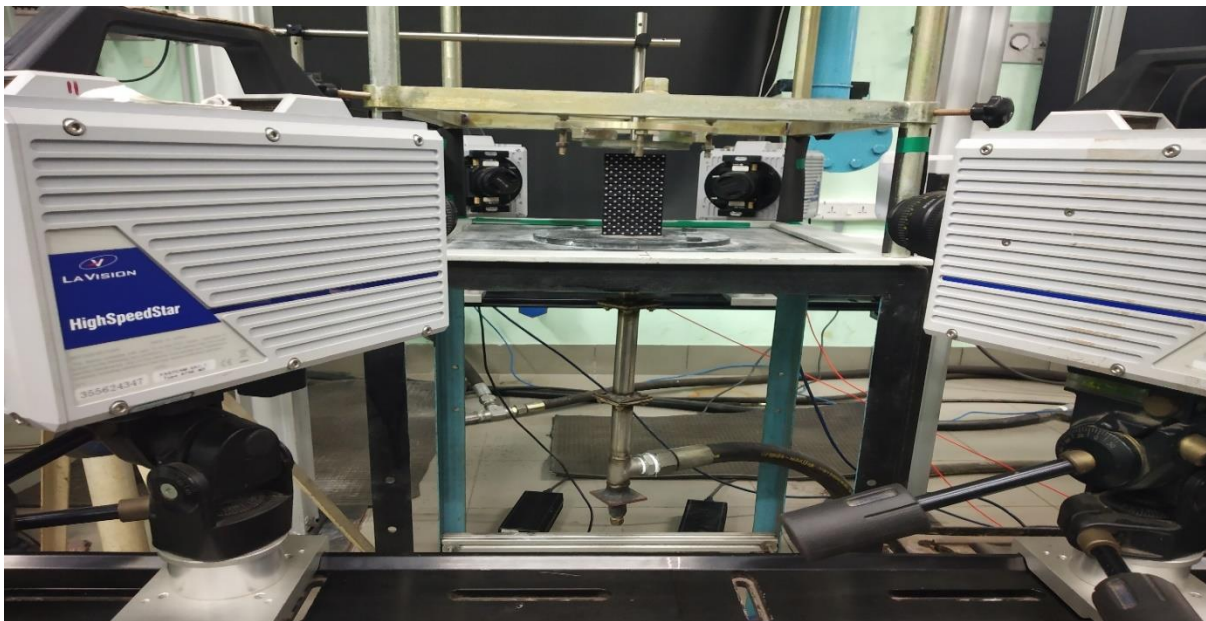
Description-Measure gas Temperature



Measure gas flow

High speed stereo particle image velocimetry (piv system)

Description- Measure time resolved three component velocity field in a volume



High Speed Tomographic PIV 4 Camera

Component laser Doppler velocimetry LDV system

Description- Measure the velocity of particle in the flow



3D Miniature Laser Doppler Velocimetry

30KVA UPS -1NO& 10KVA UPS

Channel hot wire anemometer (HWA) system

Description- Measure gas velocity



Optical accessories (optical table, x profiles, 3 axis traverses, lens, mounts, filters, UV/IR grade lenses and mirrors, camera, c mount, lenses, adapters, etc.

Description- Accessories needed for laser diagnoses.



Optical table with noiseless compressor

Pressure transducers (strain gauge, differential, piezo-electric, piezo resistive, condenser type microphone)

Description- Measure static and dynamic pressure



Micro manometers, scanivalve, flow meters, anemometers, etc.

Description- Measure static instant time



Alicat Mass flow controller

Thermal analysers (TGA, DTA, DSC, TMA)

Description- Measure exhaust gas composition.



Indus fuel gas analyser

3m sa-2000 dual Gas detector



GAS Detector for Hydrogen gas

High pressure thermogravimetric analyser

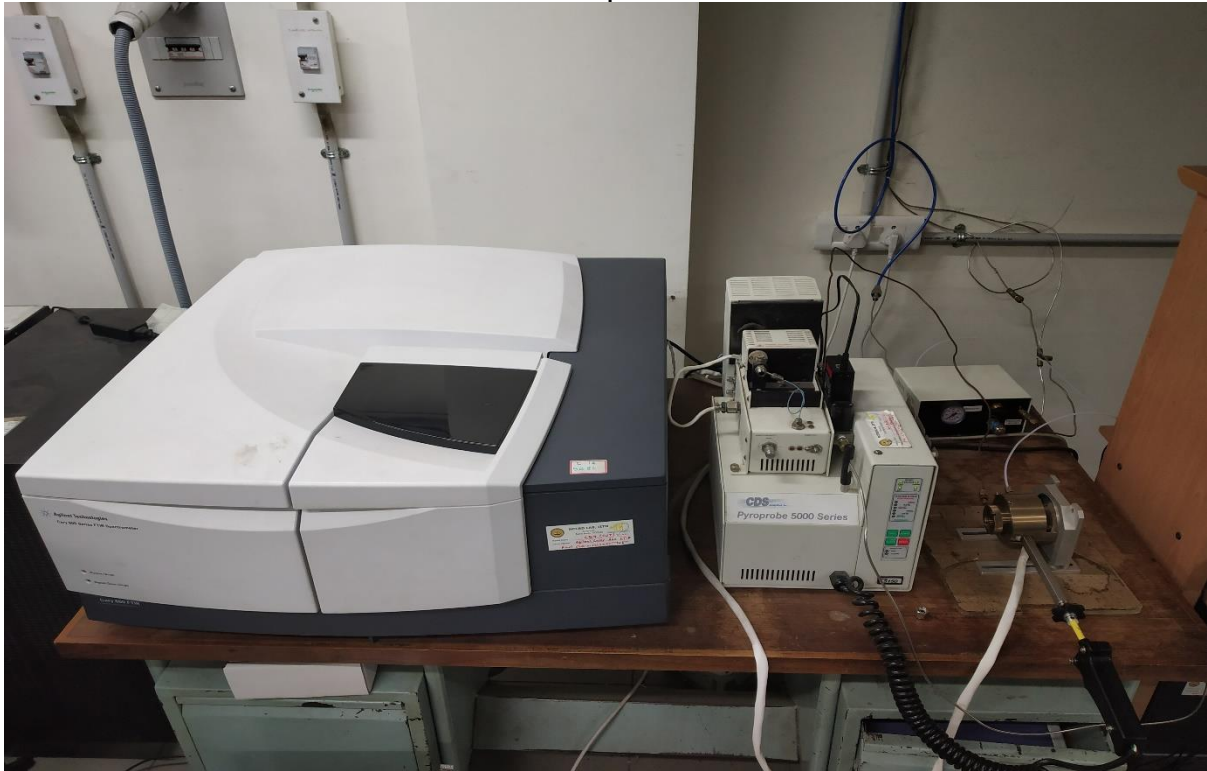
Emission analysers (8 species)-3no

Description-Study performance and exhaust of IC engines.



FTIR Spectroscopy capable of taking solid, liquid, and gaseous samples (for aerosol analysis)

Description- Determine the organic functional groups in solid and liquid samples



Calorimeter for fire safety characterisation

Description- Test for heat and visible smoke release rates for materials up to a size of 100mm X 100mm with a peak heat release rate of 0.15 kW



Cone calorimeter

Open calorimeter



Pyro probe



Bio-diesel rancimat



Bhoomi Analysers



Digital weighing machine-labman

Proximate ultimate and sulphur analyser for coal (and other solid fuels)

Description- Perform proximate analysis of solid samples as per ASTM standard procedure



Data acquisition/image processing systems

Description-Acquire and process the data from the experiments.



Dell 3020 Led computer



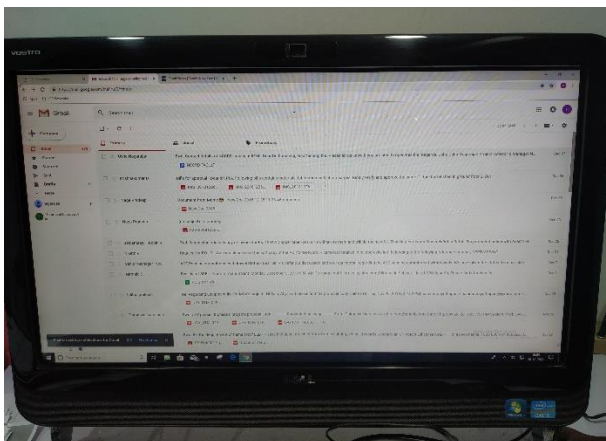
Kyocera- Plain paper copier



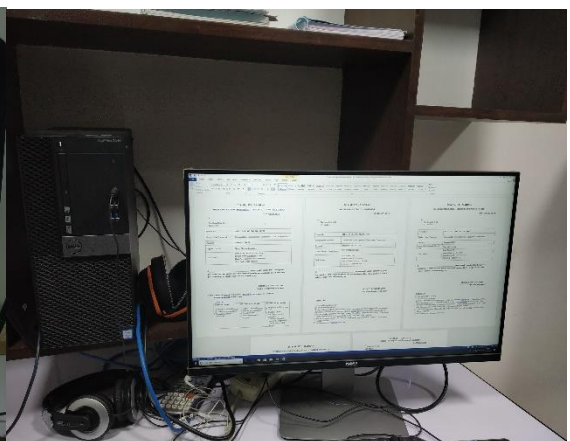
UPS system with power-10kva



30 kva ups



Dell Vostro computer 360 AIO



Dell computer 3040 Model

Frequency analyser, wave form generators, signal conditioners, oscilloscopes.

Description-Measure frequency to create wave (sine, pulse)



Wave form generator

Vitiated hot air supply (50,000 litres at 15 bar and 1000 deg.c)

Description-Supply continuous compressed air for experiment



Compressor –Ingersoll rand model 2475

compressed air pipe lines



Reciprocating compressor- 2stage 120hp
Supply of air at 40 bar



Ingersoll rand screw Air compressor-3no
to supply at 10 bar

Air conditioning, ducting and other site preparations

Description-Machines used to assist the projects.



Esteam Brand Workshop lathe



Akash Brand Bench grinder



EIFCO Hydraulic drilling Machine
And motor



Hydraulic hand pallet and stacker-1set



Diesel forklift



Gemini AC water chiller unit



Epson projector



Polycom sound station

High performance computing cluster

Description-High performance computers for post processing and data storage.



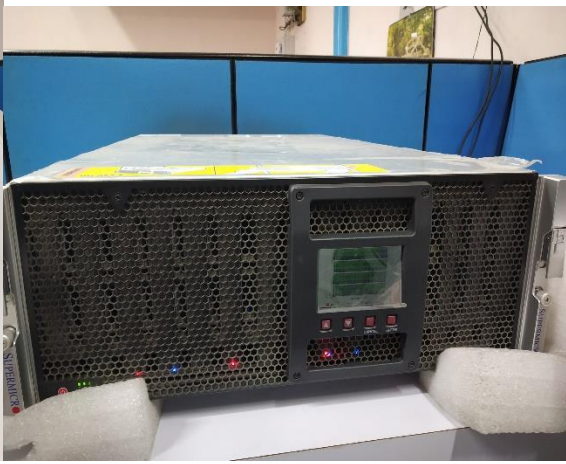
UPS system with dc power pack 10kva



Dell workstation-T5600



Fulitsu Celsius R920-Work station



Boston Data Server