

Complete Eddy flux / Covariance System Package	
System Component	Specification
Eligibility criteria for vendor	<p>1. A list of at least 3 Institutions/R&D units where similar eddy flux / covariance system have been supplied in India, including contact details (name of the person-in-charge, email, and phone number), is to be provided.</p> <p>2. Three performance certificates of the similar eddy flux / covariance system in reputed institutions in India should be enclosed duly signed and stamped by the concerned scientist.</p>
Installation	The Eddy Flux tower will be installed in an Agricultural Field in Tirunelveli District of Tamil Nadu and NOT at IIT Madras campus
Comprehensive Warranty (5 years)	Full Comprehensive AMC (including replacement of spare parts) for 5 years from the date of installation with field visits twice every year for 5 years
DATALOGGER	Measurement and Control Datalogger to log and store the data locally with SD memory card (16 GB or higher) Optional USB Drive.
GSM / GPRS for remote monitoring and data acquisition	The GSM /GPRS system should be compatible with the mobile network systems in India. Including network service plan for 5 years
OPEN PATH CO ₂ /H ₂ O GAS ANALYZER & Integrated or Stand Alone 3D SONIC ANEMOMETER	<p>Operating Temperature Range: -25° to +50°C Calibrated Pressure Range: 70 to 106 kPa Measurement Rate: 60 Hz Output Bandwidth: 5, 10, or 20 Hz; user programmable Output Options: SDM, RS-485, USB / Ethernet (CO₂ and H₂O Analog/Digital) Auxiliary Inputs: air temperature and pressure Necessary conductors, mounting brackets and Cables of Length: Minimum 10m or more</p> <p>For Gas Analyzer</p> <p>Precision RMS (CO₂) 0.2 mg/m³ (0.15 μmol/mol) Precision RMS (H₂O) 0.004 g/m³ (0.006 mmol/mol)</p> <p>Accuracy within 2%</p> <p>Calibrated Range (CO₂) 0 to 1,000 μmol/mol</p>

	<p>Calibrated Range (H₂O) 0 to 72 mmol/mol</p> <p>Standard Operating Temperature Range: -40° to +70°C</p> <p>Relative Humidity:</p> <p>Measurement Range 0 to 100% RH Accuracy ±2% (at 25°C, over the range 80 to 100% RH)</p> <p>Air Temperature:</p> <p>Measurement Range -40°C to +70°C Accuracy ±0.2°C (over the range -40 to +70°C)</p> <p>Solar Radiation Shield (Necessary conductors, mounting brackets and Cables of Length: minimum 10m or more)</p>
AIR TEMPERATURE & RELATIVE HUMIDITY SENSOR	
WIND SPEED & DIRECTION SENSOR	<p>Wind Speed Range 0 to 60 m/s Accuracy ±2% (@ 12 m/s) Resolution 0.01 m/s</p> <p>Wind Direction Range 0° to 359° (no dead band) Accuracy ±3° Resolution 1°</p> <p>(Necessary conductors, mounting brackets and Cables of Length: Minimum 10m or more)</p>
BAROMETRIC PRESSURE SENSOR - SETRA	<p>Pressure Range 600 to 1100 hPa Resolution ±0.01 hPa Accuracy ±2.0 hPa (@ -40° to +60°C) (Necessary conductors, mounting brackets and Cables of Length: Minimum 10m or more)</p>
RAINFALL SENSOR	<p>Resolution 1 tip Accuracy 1.0% up to 50 mm/h (2 in./h) (Necessary conductors, mounting brackets and Cables of Length: Minimum 10m or more)</p>
Multi Profile SOIL MOISTURE & TEMPERATURE SENSOR	<p>Measurements Made: Volumetric water content (VWC), electrical conductivity (EC), and temperature</p> <p>Operating Temperature Range: -40° to +60°C</p> <p>Measurement Depths: 5, 10, 20, 30, 40, 50, 60, 75, and 100 cm</p> <p>Electrical Conductivity Range 0 to 10 dS/m</p>

	<p>Accuracy $\pm 2\%$ (0 to 2.5 dS/m) $\pm 5\%$ (full range)</p> <p>Volumetric Water Content Range 0 to 100% Water Content Accuracy $\pm 1.5\%$</p> <p>Soil Temperature Accuracy $\pm 0.15^\circ\text{C}$ (between -30° and $+40^\circ\text{C}$)</p> <p>(Necessary conductors, mounting brackets and Cables of Length: Minimum 10m or more)</p>
SOIL HEAT FLUX SENSOR (Self Calibrating)	<p>Temperature Range -30° to $+70^\circ\text{C}$ Measurement Range $\pm 2000\text{ W m}^{-2}$ Accuracy: -15% to $+5\%$ (Necessary conductors and Cables of Length: Minimum 10m or more)</p>
PAR Sensor	<p>Field of View (FOV) 180° Spectral Range 390 to 690 nm Spectral Selectivity $< 10\%$ Operating Temperature Range -40° to $+70^\circ\text{C}$ Measurement Range 0 to $4000\ \mu\text{mol m}^{-2}\text{ s}^{-1}$ Sensitivity 0.01 mV per $\mu\text{mol m}^{-2}\text{ s}^{-1}$</p> <p>(Necessary conductors, mounting brackets and Cables of Length: Minimum 10m or more)</p>
Four Component NET RADIOMETER	<p>Sensor Two thermopile pyranometers, two pyrgeometers Measurement Description Measures incoming and outgoing short-wave and long-wave radiation</p> <p>Pyranometer</p> <p>Spectral Range 385 to 2105 nm (upward-looking) 295 to 2685 nm (downward-looking)</p> <p>Sensitivity 0.057 mV per W/m^2 (upward-looking) 0.15 mV per W/m^2 (downward-looking)</p> <p>Pyrgeometer Spectral Range 5,000 to 30,000 nm Sensitivity 0.12 mV per W/m^2</p> <p>(Necessary conductors, mounting brackets, ventilation units and Cables of Length: Minimum 10m or more)</p>
Infrared Canopy Temperature (2Nos.)	<p>Wavelength Range 8 to 14 μm (corresponds to atmospheric window)</p>

	Field of View (FOV) At least 20° (half angle) Absolute Accuracy $\pm 0.2^{\circ}\text{C}$ (-10° to +65°C)
Software, Data Acquisition system and Online monitoring and control	All necessary software(s) to acquire, process and analyse the data including online monitoring and control should be provided
MOUNTING HARDWARE	Heavy Duty Adjustable Tripod (2-10 Meters)
Necessary Enclosures for the data loggers, power supply, battery / batteries, solar panels	As needed should be provided