The most advanced Langmuir Probe on the market

The Langmuir Probe is one of the most widely used plasma measurement instruments. It is used to measure the characteristics of the bulk plasma region. The Impedans Langmuir Probe System measures the key plasma parameters such as plasma potential, charged particle density (electron & ion) and the electron temperature using the most advanced theoretical models available. Langmuir probe measurements provide the user with fundamental insights into the physical phenomena that govern plasma behaviour. With an 80 MS/s sampling rate, pulse profiling and single shot plasmas can be measured with unrivaled time resolution.

Key Features

- Interchangeable single, double, spherical, planar and Mach probe head options.
- Time averaged, time trend, synchronised pulse profile and triggered fast-sweep modes.
- Automated tip cleaning function using plasma electron bombardment to remove oxides and insulating layers.
- Integrated linear drive mechanism available to automatically profile spatial plasma uniformity.
- Up to 5 integrated RF compensation filters in the one probe with a DC reference probe as standard.
- Compatible with DC, Pulsed DC, RF, Pulsed RF, vMicrowave and other plasma excitation methods.
- There are over 100 publications using this system.

Key Benefits & Applications

- Multiple, interchangeable probe head types in a single system, lowering the cost of ownership.
- State of the art plasma models built into the software for automatic data analysis.
- Intuitive and user-friendly interface.
- Saves time and improves productivity through sophisticated automation features. Batch scripts can be input for automation of measurements.
- Robust and durable design to survive in extreme plasma environments.
- Custom probe options including right angle elbows and flexible probe shafts to fit any chamber.
- Provides measurements for fundamental research, process development and model benchmarking.

EEPF

Spatial Data
Model Specifications

<table>
<thead>
<tr>
<th>Model #</th>
<th>Product Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>02-0144-02</td>
<td>Fixed Probe 10 mm</td>
<td>10 mm OD, rigid, Alumina Shaft (&lt;1 m length)</td>
</tr>
<tr>
<td>02-0463-01</td>
<td>Fixed Probe 6.5 mm</td>
<td>6.5 mm OD, Rigid, ceramic coated stainless steel shaft (&lt;1 m length)</td>
</tr>
<tr>
<td>02-0501-01</td>
<td>Feed-through for flexible shaft models</td>
<td>Feed-through for flexible Langmuir Probes</td>
</tr>
<tr>
<td>02-0466-01</td>
<td>Flexible 10 mm Shaft</td>
<td>Rigid tip section with flexible ceramic beaded cable</td>
</tr>
<tr>
<td>02-0467-01</td>
<td>Flexible 6.5 mm Shaft</td>
<td>Rigid tip section with flexible ceramic beaded cable</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model #</th>
<th>Product Name</th>
<th>Current Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>02-0241-01</td>
<td>Langmuir Probe</td>
<td>Electronics Unit</td>
</tr>
<tr>
<td>02-0045-01</td>
<td>Langmuir Probe</td>
<td>Electronics Unit</td>
</tr>
<tr>
<td>02-0460-01</td>
<td>Langmuir Probe</td>
<td>Electronics Unit</td>
</tr>
</tbody>
</table>

General Specifications

- **Probe Length**: 150 mm to 1400 mm
- **Probe Tip Length**: 10 mm, Customisable
- **Probe Tip Diameter**: 0.4 mm, Customisable
- **Probe Tip Material Options**: W, Ta, Ni, Pt
- **Max. Operating Temperature**: Model #02-1444-02: Air Cooled 230 °C
  - Model #02-1444-02: No Cooling 125 °C
  - Model #02-0463-01: 900 °C
  - Model #02-0501-01: 125 °C
- **RF Compensation Frequencies**: Max. 5
- **Typical RF Frequency Compensation Options**: 400 kHz, 2 MHz, 13.56 MHz, 27.12 MHz, 40.68 MHz, 60 MHz
- **Plasma Reactor Types**: DC, Pulsed DC, MF, RF, Pulsed RF, Microwave, Atmospheric Plasmas
- **Linear Drive Options**: 150, 300, 450, 600 & 900 mm
- **Time Resolved Step Resolution**: 12.5 ns
- **Air Cooling Inlet**: 4 mm tube push fit
- **Max. Compressed Air Pressure**: 4 bar
- **Voltage Scan Range**: -150 to +150 V
- **Sensor Pulse Synchronisation**: External sync: TTL input trigger (1 Hz to 1 MHz)

Langmuir Probe System Plasma Parameter Ranges

- **Floating Potential**: -145 V to +145 V
- **Plasma Potential**: -100 V to +145 V
- **Plasma Density**: $10^6$ to $10^{13}$ cm$^{-3}$
- **Ion Current Density**: 1 μA/cm$^2$ to 300 mA/cm$^2$
- **Electron Temperature**: 0.1 eV to 15 eV
- **Electron Energy Probability Function (EEPF)**: 0 eV to 100 eV

Publication list available at: impedans.com/langmuir-publications