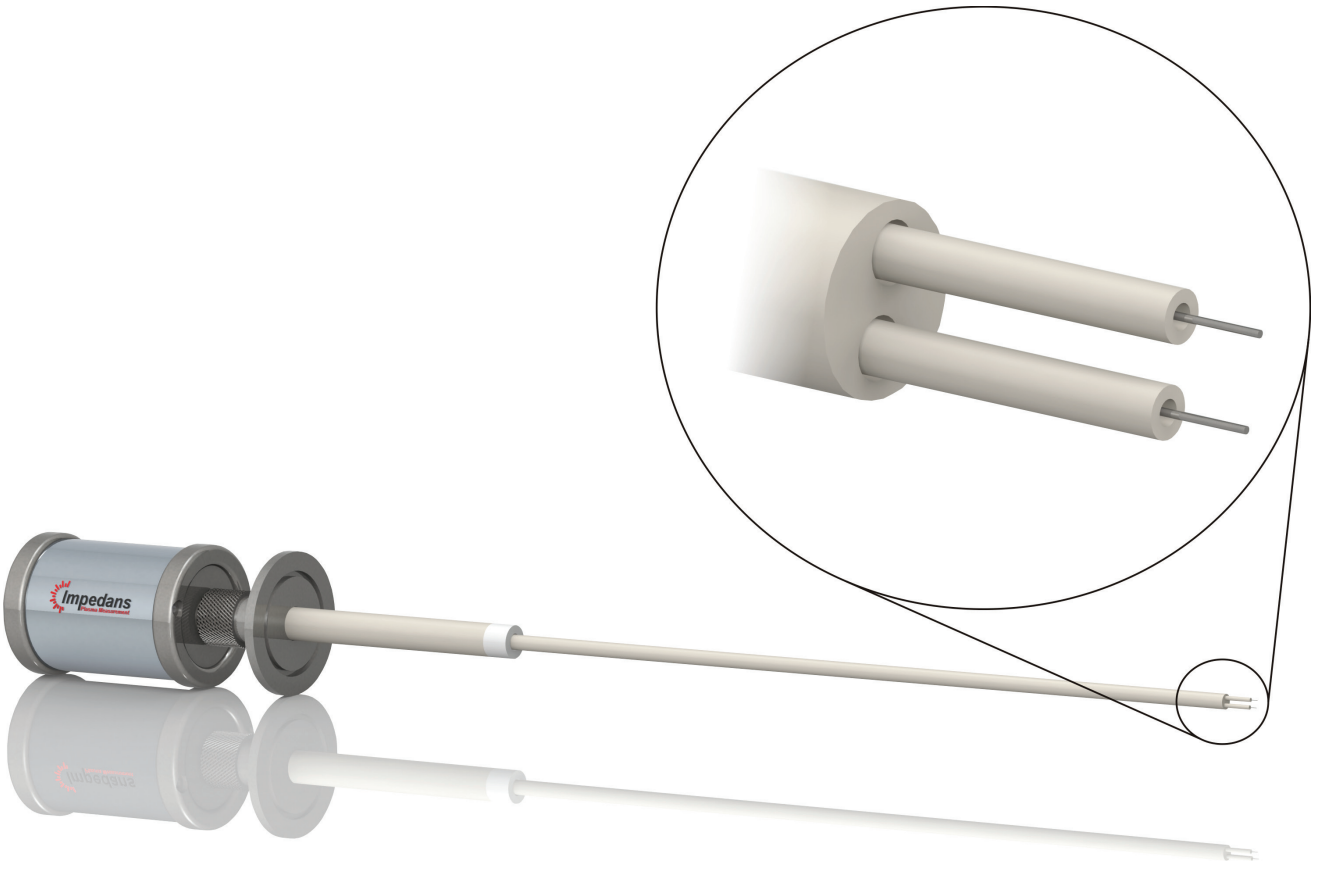
Langmuir DoubleProbe™

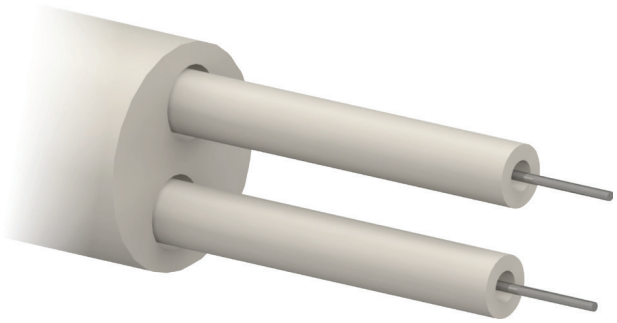
Double Langmuir Probe System



Impedans
Plasma Measurement

Self Biasing Probes
No Ground Required
Does Not Deplete Electron Density

Plasma Density
Ion Current Density
Electron Temperature



The **DoublePrbe™** is a precision plasma measurement instrument used in a large number of plasma laboratory applications. The **DoublePrbe™** is the key instrument used by scientists to measure the internal parameters of plasma. Among the key parameters measured are plasma density and electron temperature. The **DoublePrbe™** provides plasma parameter measurement in DC, RF, Microwave, Continuous and Pulsed plasma.

The **DoublePrbe™** has the most advanced technology on the market and enables one probe to be biased with reference to the second probe, without requiring the current to be returned to ground. This feature allows The **DoublePrbe™** to accurately measure the plasma parameters in plasmas with insulating walls and in conditions where the plasma is sensitive to ground return current. The **DoublePrbe™** is the fastest and most reliable Langmuir double probe in the world (time resolution 12.5ns). As well as The **DoublePrbe™** being the fastest and most reliable Langmuir double probe on the market it also provides the most advanced and trusted, fully automated data analysis in real time.

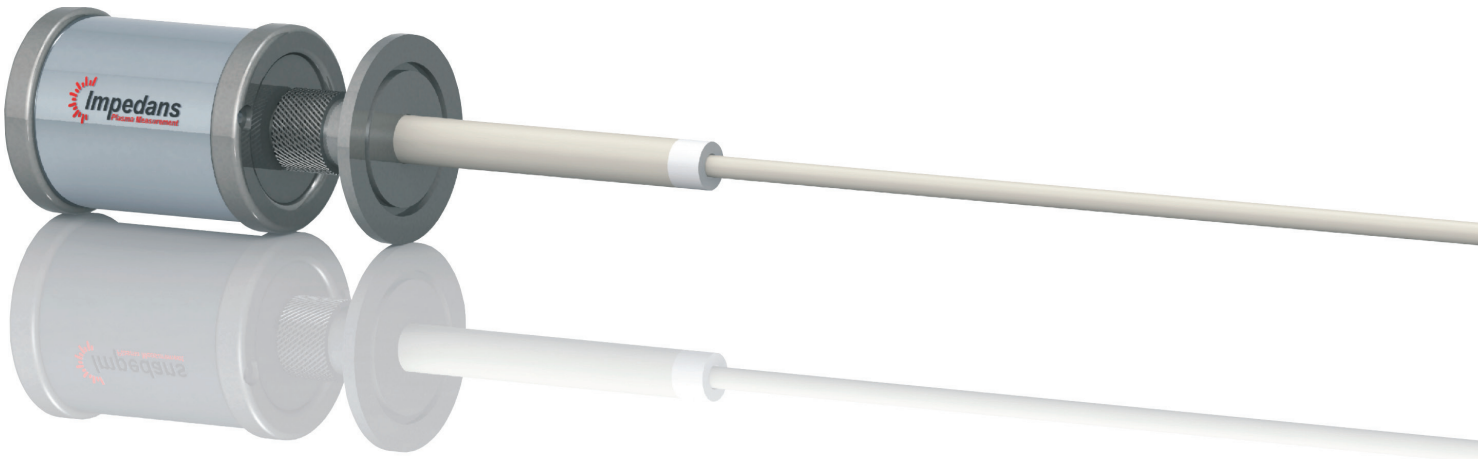
The **DoublePrbe™** is used to establish plasma process repeatability. It helps the user to understand plasma changes and the impact on surface treatment. The **DoublePrbe™** is an essential plasma process diagnostic for understanding the correlation between plasma inputs and the plasma state. The **DoublePrbe™** will help reduce process and tool development time and the time to market for new plasma products. Pulsed plasmas are used to tailor the electron or ion energy and The **DoublePrbe™** is an integral part of such process development.

Key Indicators

Plasma Density	$1x10^{8}$ to $3x10^{13}cm^{-3}$
Ion Current Density	$1uA/cm^2$ to $30mA/cm^2$
Electron Temperature	0.1 to 15 eV
Plasma Power Source	DC, RF, Microwave, Continuous, Pulsed Plasma
Time Resolution	12.5 ns
Ion Current Density	$1uA/cm^2$ to $300mA/cm^2$
Electron Temperature	0.1 to 15 eV

Benefits

- Low Disturbance Probe
- Robust and Easy to Install
- Easy to Use Software
- Real Time Measurements
- Automatic Tip Cleaning
- Replaceable Probe Tips
- Fastest Langmuir Probe in the World
- Custom Probe Shafts Available
- High Degree of Accuracy
- Key Instrument for Measuring Plasma Parameters
- Pulsed Power Compatible
- Broadband



Specifications

Plasma Parameters	
Plasma Density	$1x10^{8}$ to $3x10^{13}cm^{-3}$
Ion Current Density	$1uA/cm^{2}$ to $30mA/cm^{2}$
Electron Temperature	0.1 to 15 eV

Langmuir Probe	
Plasma Power Source	DC, RF, Microwave, Continuous, Pulsed Plasma
RF Plasma	Broadband Probe 2MHz to 100MHz
Probe Length	300mm to 1400mm (Custom Available)
Probe Diameter	6.5mm (Custom Available)
Probe Customisation	On request
Maximum Operating Temperature	230°C (Custom up to 1200°C)

Electronics Control Unit	
Probe Voltage Scan Range	-150 V to +150 V
Current Range	15 nA to 150 mA
Communication	USB 2.0
Sampling Rate	80 MSPS (V,I)
Data Acquisition Resolution	4.5mV, 4.5nV
Time Resolved Step Resolution	12.5nS
External Trigger	TTL Compatible 10Hz to 1 MHz

Application Software	
Operating System	Windows 2000, XP, Vista, Windows 7

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Plasma Measurement

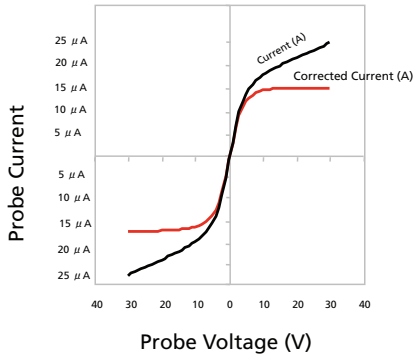
Product Operating Parameter Table

High	> 10^5Pa	>760 Torr	> 5000°	> 10^{14} cm^{-3}	SiH_4	Microwave (3 GHz - 20 GHz)
	1000Pa - 10^5Pa	10 - 760 Torr	5000°	10^{12} - 10^{14} cm^{-3}	$C4F_8$, SF_6	Microwave (1 GHz - 3 GHz)
	100Pa - 1000Pa	1 - 10 Torr	1000°	10^{10} - 10^{12} cm^{-3}	CHF_3	UHF (100 MHz - 1 GHz)
Medium	10Pa - 100Pa	0.1 - 1 Torr	500°	10^8 - 10^{10} cm^{-3}	Cl	RF (1 MHz - 100 MHz)
	1Pa - 10Pa	10 - 100 mTorr	200°	10^6 - 10^8 cm^{-3}	O_2	MF (0 - 1 MHz)
	0.1Pa -1Pa	1 - 10 mTorr	100°	10^4 -$10^6$$cm^{-3}$	N_2	pDC (0 - 350 kHz)
Low	< 0.1 Pa	< 1 mTorr	20°	< 10^4 cm^{-3}	Ar, He	DC (0 kHz)
	Pressure (Pascal)	**Pressure (Torr)**	**Gas Temperature**	**Density**	**Gas Reactivity**	**Power Frequency**

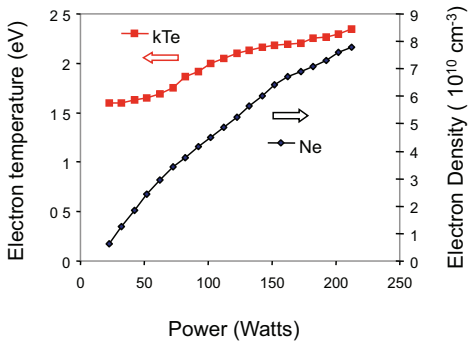
System Operating Parameters Beyond Operating Parameters

Graphical Data

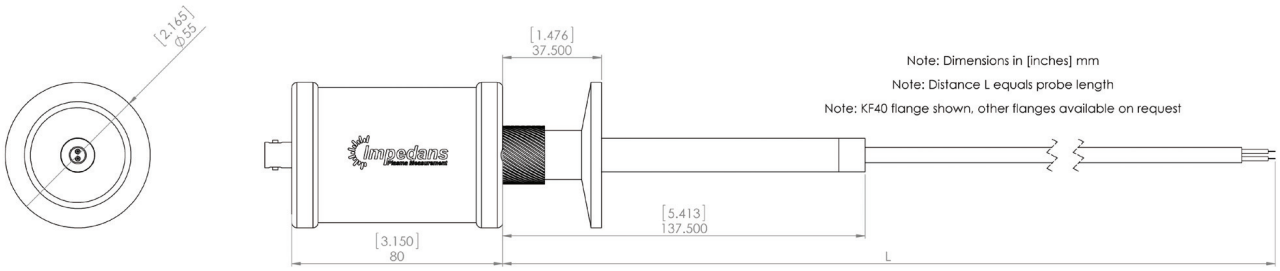
Langmuir Double Probe Current and Corrected Current as a Function of Probe Voltage



Plasma Parameters as a Function of Power



Product Dimensions



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