



# Ambient Pressure Photoemission System with Nitrogen Environment

APS04-N2-RH

## System Description

The Ambient Pressure Photoemission Spectroscopy with Nitrogen Environment system (APS04-N2-RH) allows the measurement of material energy levels under nitrogen or ambient conditions. Absolute work function ( $\Phi$ ) can be measured with an accuracy of 0.05 eV. The relative humidity in this system can be automatically controlled from 20% to 85% via the user-friendly software. As well as this, the APS04-N2-RH comes with the KP Technology Scanning Kelvin Probe platform, perfect for plotting the changes in properties over the sample surface.

The APS04-N2-RH incorporates a tuneable deep ultra-violet (UV) source outputting 3.4-7.0 eV, for absolute work function and highest occupied molecular orbital (HOMO) measurements, a surface photovoltage spectroscopy (SPS) module outputting 400 - 1000 nm for  $V_{oc}$  and  $E_g$  measurements, together with a 50 x 50 mm scanning area for planar relative work function measurements (Fermi level). This system allows absolute work function determination in the presence of a nitrogen atmosphere. Our dedicated software allows the user full control of the energy scan ranges, tip potential, signal gain and averaging. Cube or square root fitting of the emission data over user-selectable photon energy, normalised light intensity and baseline correction.



*APS04-N2-RH system with ambient pressure photoemission spectroscopy, nitrogen environment and scanning capabilities*

## Features

- Work function by photoemission in air/N<sub>2</sub>
- Work function resolution of  $\leq 3$  meV
- Automatic control of relative humidity
- Atmospheric control to  $< 1\%$  oxygen
- 3.4 eV to 7.0 eV energy range

## Applications

- Organic and non-organic semiconductors
- Metals and metal alloys
- Thin films and surface oxides
- Nanotechnology
- Solar cells and organic photovoltaics



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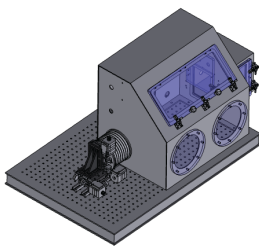
APS04-N2-RH

## System Specifications

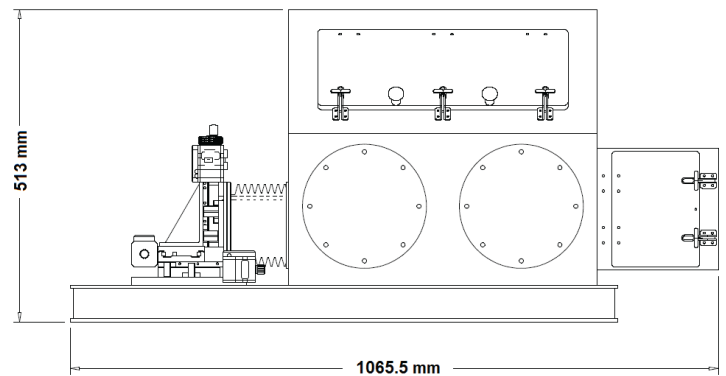
	APS04-N2-RH
Tip material/diameter	2 mm stainless steel
Absolute work function resolution ( $\Phi$ )	$\leq 0.05$ eV
Contact potential difference resolution ( $\Delta\Phi$ )	$\leq 0.001$ eV
Sample scanning	50 x 50 mm
Atmospheric control	Nitrogen and RH control
Relative humidity range	20-85%
Height control	25 mm automatic
Kelvin probe mode and PE mode	CPD and PE measurements
WF measurement time	PE measurements in < 5 minutes
Optical system	Colour camera with zoom lens for monitoring and positioning
Oscilloscope	Digital TFT oscilloscope for real time signal
Test sample	Gold, aluminium, silver and silicon solar cell test samples
Breadboard footprint	900 x 600 mm
Control supplied	PC control with dedicated software
Detection system	Off-null with parasitic capacity rejection
Warranty	12 months

## Upgrades and Add-ons

- Surface Photovoltage (QTH or LED)
- Surface Photovoltage Spectroscopy (400-1000 nm)
- Sample Heating to 115°C



Isometric view of the glove box section of the APS04-N2-RH system



Dimensions of glove box section of APS04-N2-RH system

## The Company

KP Technology Ltd was founded with the aim of bringing to the market new surface research tools. These tools have featured in over 250 peer-reviewed client publications in the last 3 years. KP Technology Ltd also performs a significant amount of material research and training consultancy, mostly based upon the work function ( $\Phi$ ) or surface potential evaluation of client samples. KP Technology Ltd holds international patents on their Ambient Pressure Photoemission Spectroscopy (APS) system for measuring absolute workfunction. Along with a strong research and development division and over 500 systems shipped worldwide, this has placed KP Technology Ltd as the leading supplier of Kelvin probes in the world.

## Contact

For quotation requests, further information or to discuss any research or particular measurements, please feel free to contact us:

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KP Technology Ltd is the proud winner of the Queens Award for Enterprise: International Trade 2013

