

Full Automation  
for multi-element analysis

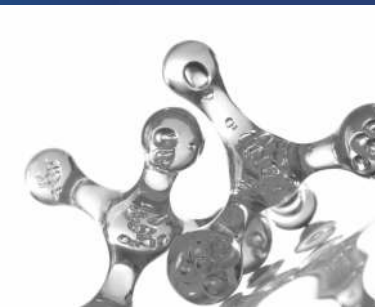
**NEW**

# AA8000

ATOMIC ABSORPTION SPECTROPHOTOMETER

**GLP COMPLIANT**

**LABINDIA**  
ANALYTICAL  
WHERE COMMITMENT IS CULTURE



The AA8000 Atomic Absorption Spectrophotometer is a double beam with sealed and vibration free optical system, having Czerny-turner Monochromator with Holographic grating (1800 lines/mm). It's a high performance automated instrument designed to meet the requirements of the modern laboratory. Due to its versatility and performance it can be used for a wide range of applications including: Agriculture, Soil, Environmental, Food, Metal, Mining, Petrochemical, Clinical, Pharmaceutical.

The Instrument is available in three configurations:

- **AA8000F** - The Instrument is equipped with a Flame atomiser only. 3 flames are available with the air/acetylene as standard configuration and  $N_2O$ /acetylene or air/LPG (natural gas) available as an option. All 3 flame configurations offer coded burner for full safety protection.
- **AA8000G** - The Instrument is equipped with a Graphite Furnace Atomiser only. The Graphite head is fixed into the optical path to maximise performance and eliminate drift. The transversally heated graphite tube is efficiently heated and cooled due to the precision feedback system.
- **AA8000FG** - The Instrument is equipped with both Flame and Graphite Furnace Atomiser's as detailed in the previous description. Both configurations are installed into the instrument and can be changed over by a simple selection in the versatile AA-Win software.

#### SALIENT FEATURES

- Benchtop Model.
- PC system built into the instrument as standard. Windows professional platform with latest version operating system.
- Full software control of the instrument and autosampler.
- Pre-installed AA-Win Software GLP and 21- CFR Part 11 Compliant, export of data to other applications and integrated QC Protocol.
- Automatic 8 lamp turret controlled and optimized by the AA-Win software.
- Automatic alignment and optimization of energy using coded lamps & built-in power supply.
- GLP compliant software is now available for all AA8000 Configurations.
- D2 lamp or Self reversal background systems.
- High precision minimal optics ensures maximum light throughput to the computer controlled Czerny-Turner monochromator.
- High sensitivity absorbance better than 0.9abs for 5ppm Cu
- A universal autosampler is available which can be used for flame as well as graphite furnace system with Auto Dilution facility.
- Absorption and Emission modes are standard as well as peak height, peak area, sequential and manual integration modes.
- Auto-flame Ignition. Nebulizer Interlock for gas leakage etc.
- New upgrade available with Full Automation for Multi-Element Analysis.
- Spray chambers chemically inert material capable of handling all corrosive materials.

#### SOFTWARE FEATURES

- Built in AA Cookbook for all elements
- Easy built in user Tools
- Automatic programming multiples of 8 elements approx 32
- Instrument controlled via built in PC
- Hollow Cathode Lamp Energy Graph
- Normal, Standard addition and standard curve calibration methods supported
- Flexible and comprehensive results database filters to select and display the required data.
- Validation Package
  - a. Validation should be able to be performed by the operator
  - b. Automatic OQ test available
- Height of Burner Head - stored in method
- Gas flow control: Fully Automatic. Total gas flow control system to maintain gas flows (ratio of fuel / oxidant) at set levels even when subjected to outside variations like nebuliser adjustments. Automatic gas flow adjustment during change over between air  $C_2H_2$  &  $N_2O$

#### FLAME ATOMISER FEATURES

3 flame systems are available. Air/acetylene is the standard configuration with the  $N_2O$ /acetylene and Air/LPG as options.

##### Air/Acetylene

- This flame uses a 100mm single slot burner for standard configuration.
- The high sensitivity (Cu 5ppm > 0.9A) is due to the efficiency of the fixed position High Efficiency Nebuliser fitted as standard. An acid resistant replacement is available as an option.

##### $N_2O$ /Acetylene

- The burner for this gas has a 50mm slot and is used to measure elements less prone to ionization such as: Aluminium, Tin, Titanium, Calcium and Vanadium.
  - The switchover from air/acetylene and flame off is fully computer controlled.

##### Air/Propane (LPG)

- This flame uses a 3 slot burner and with the low pressure requirement it is also much safer to operate. Due to the lower temperature it is ideal for analysing alkali metals such as Potassium, Sodium and Lithium, especially when used in the Emission mode.
- There are some remote areas in the world that have difficulty obtaining acetylene or even a high enough purity to operate the flame, so LPG can



#### GRAPHITE FURNACE ATOMISER FEATURES

- The graphite furnace atomiser is available in 2 Models:
  - In the AA8000G instrument the graphite furnace head is fixed into the light path.
  - In the AA8000FG instrument the graphite furnace head is positioned automatically into the light path by a simple operation in the AA-Win software.
- Furnace Head Design
  - The Transverse head is heated and cooled efficiently due to the feedback system and has been designed to reduce analytical problems normally associated with this type of technique.
  - Pyrolytically coated graphite tubes are used as standard and are manufactured to improve performance as well as increase the analytical life.
  - Platform Tubes are supplied as standard and will accept volumes up to 20µl.
- Heating Program
  - Up to 10 heat stages are available. These can be set up and stored in the AA-Win software.
- The graphite furnace tube is cooled efficiently by an optional water circulation system / chiller.
- Safety Features:
  - Argon Gas Pressure Sensor
  - Water Flow Sensor
  - Over Temperature Sensor

#### FULLY ADJUSTABLE INERT NEBULISER

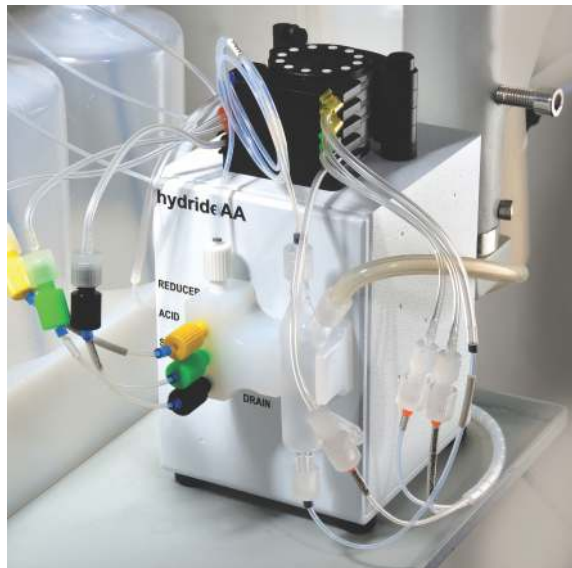


It is fully adjustable so that a wide variety of sample matrices - aqueous or organics (oils etc.), acid or alkali dilute or concentrated solutions can be analysed under optimum conditions.

- Fully inert nebuliser
- Adjustable from 2-6 ml/min
- Excellent RSD's typically <1.0%
- Enhanced sensitivity
- Resistant to all acid including HF



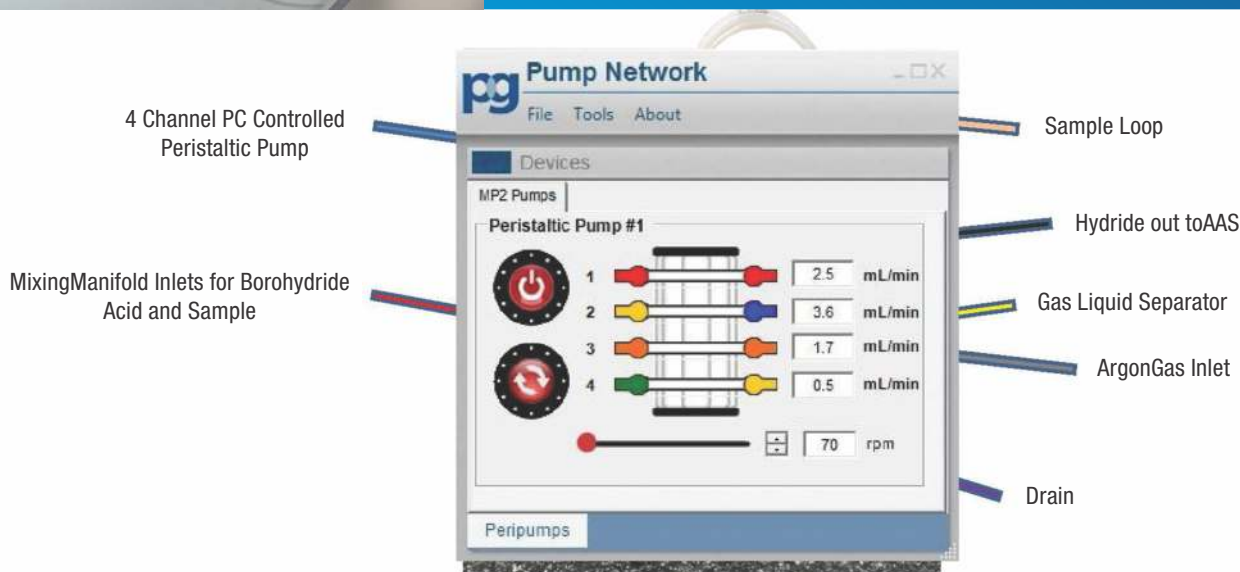
# HYDRIDE SYSTEM



## CONTINUOUS FLOW HYDRIDE ANALYSIS SYSTEM

### Main Features

- Improved detection limits for inorganic Hg
- Easily adapted to standard hydride mode with improved detection limits for As, Se, Sb and other hydride forming elements via a heated cell
- Improved stability: The micro peristaltic pump is controlled via AAHyd-Win creating a stable flow of sample and reagent and producing a stable formation of H<sub>2</sub> gas and hydrides
- Compact system the smallest footprint of its kind on the market (95mm x 118mm x 140mm)
- Chemically resistant: ceramic pins, PFA mixing block, and quartz glass



## FLOW INJECTION HYDRIDE GENERATOR

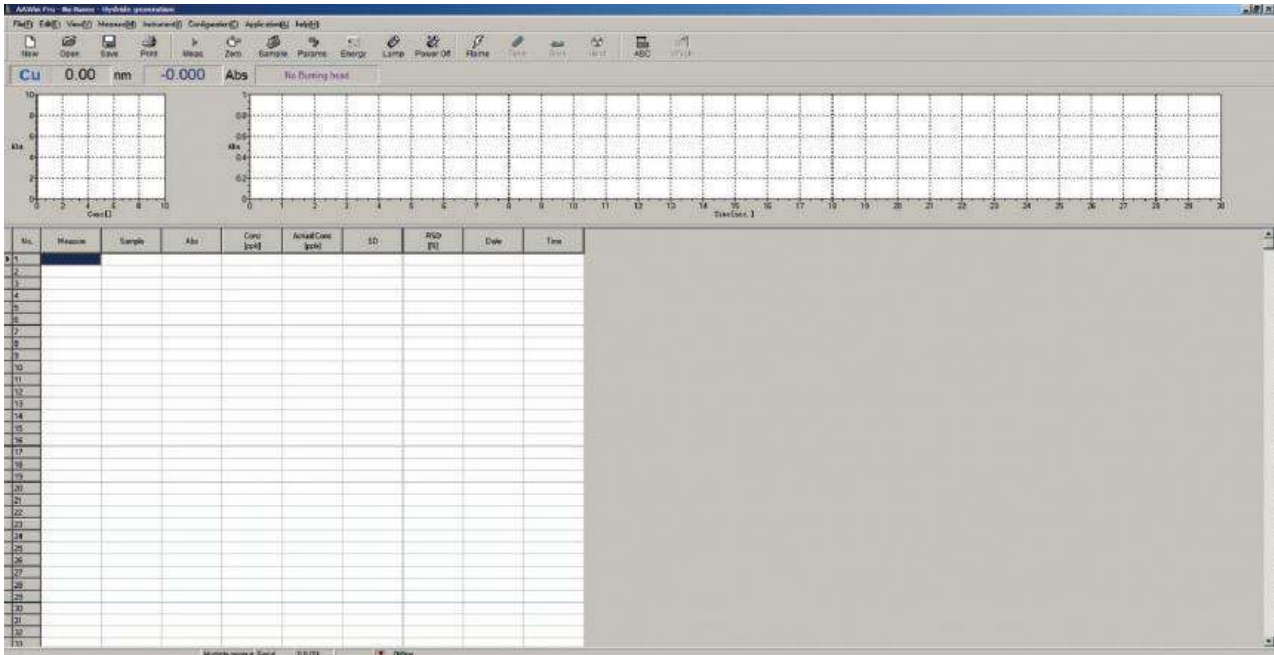
### Main Features

1. Unique pneumatic automated technology such as auto-sampling system, automatic fluid measurement system, flow stabilizer (instead of the peristaltic pump), program-time controller and so on are pneumatic automatic systems which are run by the carrier gas source pressure. Many performances are superior to those of the electric systems.
2. Highly Automatic: After pressing the start key, the whole process (sampling, reacting, calibrating and cleaning) will be finished automatically. Automatically reading is possible when connecting with the main unit (if the main unit has the function)
3. Unique electric quartz absorption tube (atomizer): compact (can be used in the Zeeman AAS), speedy temperature rising, easy installation, and stable temperature. The lifetime of this tube is 10 times longer than the flame tube. As long as the temperature lowers down, the analysis method can be changed.
4. Superior performance (sensitivity, detection limit, stability, efficiency): the sensitivity of most elements is better than 1 ng/ml/1%A. For example, the sensitivity of Arsenic is better than 0.15 ng/ml/1%A. Relative standard deviation (RSD) is lower than 3%. The single measurement will take 25 to 35 seconds.
5. High adaptive: the hydride generator can be used on all the old models of AAS
6. Good reliability: low failure rate, seldom consumables.
7. Small footprint: width\*depth\*height = 20.5(cm)\*15(cm)\*12.5(cm); weight = 1.5 kg.
8. Multiple readings: peak height reading (recommended), peak area reading, continuous reading are possible
9. Less solution: sample 2-2.5 mL (including clean). potassium borohydride 1-1.5 mL, carrier liquid 5-6 mL
10. High performance lamps for hydride elements (e.g. Pb, As, Hg, Sb & Bi)



# AAWin Software

AAWin Software is a powerful and intuitive software product designed to allow control and data acquisition.

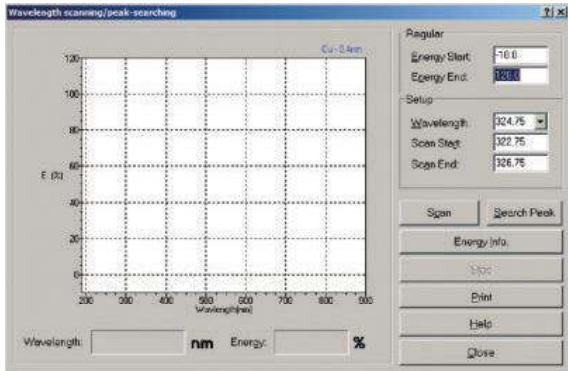


The AAWin software allows the Analyst to control all aspects of their analytical method whilst providing an extensive range of tools for data collection, storage and interpretation. The software interface consists of three key workareas, whilst having toolbars to access many others. These work areas allow the user to view real-time signal acquisition, up-t-odate display of calibration curves and a flexible, sample table. The AAWin software offers full automation allowing the user to measure multiple elements sequentially by means of a sample wizard and optional random access autosampler.

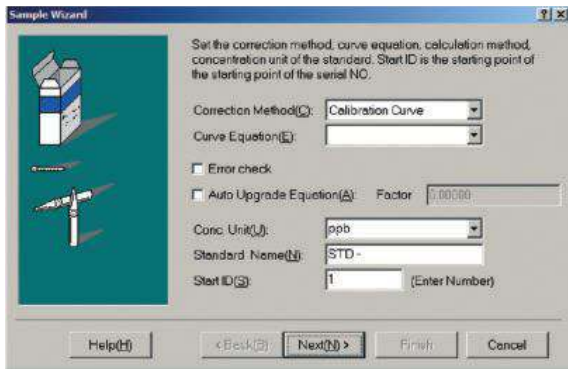


Lamp turret setup, operating and warm-up currents, along with the desired analytical wavelength are easily selected in the configuration.

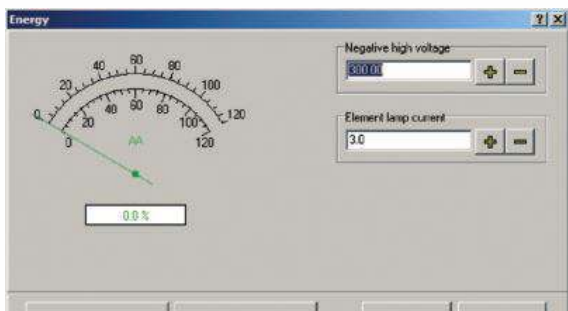
# Full Automation for Multi-Element Analysis



Ensure optimal peak position at the chosen analytical line by scanning the emissions spectra.



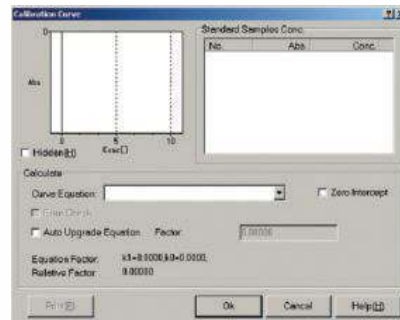
Each stage of analysis setup is made quick and simple by means of sample wizard.



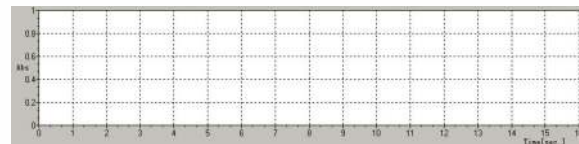
Obtain reliable and accurate results by using the energy control feature to manually optimise atomiser position and setup. Use the auto-balance feature to ensure energy level, and optical alignments are optimised when using background correction

| No. | Measure | Sample | Abs | Conc (ppb) | Actual Conc (ppb) | SD | RSD (%) | Date | Time |
|-----|---------|--------|-----|------------|-------------------|----|---------|------|------|
| 1   |         |        |     |            |                   |    |         |      |      |
| 2   |         |        |     |            |                   |    |         |      |      |
| 3   |         |        |     |            |                   |    |         |      |      |
| 4   |         |        |     |            |                   |    |         |      |      |
| 5   |         |        |     |            |                   |    |         |      |      |
| 6   |         |        |     |            |                   |    |         |      |      |
| 7   |         |        |     |            |                   |    |         |      |      |
| 8   |         |        |     |            |                   |    |         |      |      |
| 9   |         |        |     |            |                   |    |         |      |      |
| 10  |         |        |     |            |                   |    |         |      |      |
| 11  |         |        |     |            |                   |    |         |      |      |
| 12  |         |        |     |            |                   |    |         |      |      |
| 13  |         |        |     |            |                   |    |         |      |      |
| 14  |         |        |     |            |                   |    |         |      |      |
| 15  |         |        |     |            |                   |    |         |      |      |
| 16  |         |        |     |            |                   |    |         |      |      |
| 17  |         |        |     |            |                   |    |         |      |      |
| 18  |         |        |     |            |                   |    |         |      |      |
| 19  |         |        |     |            |                   |    |         |      |      |
| 20  |         |        |     |            |                   |    |         |      |      |
| 21  |         |        |     |            |                   |    |         |      |      |
| 22  |         |        |     |            |                   |    |         |      |      |
| 23  |         |        |     |            |                   |    |         |      |      |
| 24  |         |        |     |            |                   |    |         |      |      |
| 25  |         |        |     |            |                   |    |         |      |      |
| 26  |         |        |     |            |                   |    |         |      |      |
| 27  |         |        |     |            |                   |    |         |      |      |
| 28  |         |        |     |            |                   |    |         |      |      |
| 29  |         |        |     |            |                   |    |         |      |      |
| 30  |         |        |     |            |                   |    |         |      |      |
| 31  |         |        |     |            |                   |    |         |      |      |
| 32  |         |        |     |            |                   |    |         |      |      |
| 33  |         |        |     |            |                   |    |         |      |      |

Use the sample table to perform quick measurements of both Standards and Samples. Easily append the sample table to add new samples or even revise calibration curves either by manual introduction or using an Autosampler.



View up-to-date calibration curves in 1st, 2nd, or 3rd order using a standard calibration or standard addition. Perform retrospective curve fits to ensure optimum



View real-time signal acquisition for flame, graphite furnace

# AA8000 SPECIFICATIONS

## FLAME SYSTEM

|  |  |
|--|--|
| Instrument can be configured with Flame, Graphite or Integrated Flame & Graphite (interchanged using Software) |  |
| Wavelength Range   | 185nm – 915nm  |
| Optics   | Double Beam, Sealed & Vibration free optical System with a reflective optical compartment  |
| Detector   | PMT (Wide Range)   |
| Monochromator  | Czerny-turner type with Holographic Grating of 1800 lines/mm and Reciprocal Linear Dispersion better than 1.6 nm/mm, focal length 300mm.   |
| Spectral Bandwidth   | Adjustable slit from 0.1 nm. to 2 nm. (software selectable)  |
| Wavelength Accuracy  | ± 0.15nm   |
| Wavelength Reproducibility   | < 0.05nm   |
| Resolution   | 0.2nm ± 0.02nm   |
| Baseline Stability   | 0.005A/30min   |
| Sensitivity (Cu)   | >0.9 Absorbance or better for 5 ppm Cu solution  |
| Detection Limit  | Cu < 0.004 µg/ml (flame) Cd < 0.4 x 10 <sup>-12</sup> g (graphite furnace)   |
| Repeatability  | Cu < 0.7% ( Air/Acetylene flame)<br>Ba < 1.0% ( Nitrous oxide/Acetylene flame)<br>Cu < 2.0% Cd < 2.0% (Graphite Furnace)   |
| Background Correction  | Deuterium Arc / Self reversal upto 2.5 Absorbance  |
| Characteristic Concentration   | Cu < 0.02 µg/ml, Ba < 0.15 mg/ml (N <sub>2</sub> O/Acetylene) Burner Heads   |
| Nebuliser  | High Efficiency Nebuliser  |
| Burner Head  | Titanium Alloy   |
| Atomization Chamber  | Corrosion-resistant material   |
| Position Adjustment  | Automatic changeover (AA8000GF) Manual (AA8000F)<br>Automatic Setting of Optimum Height for Flame Burner.<br>Burner movement in horizontal & vertical direction by software.                       |
| Safety Functions (Interlocks)  | Burner Identification, Flame Sensor, Gas leak Sensor,<br>Low Gas Pressure Sensor, Drain Trap Sensor,<br>Power Loss Protection, Circulation Water (graphite),<br>Over Temperature Sensor (graphite) |

## GRAPHITE SYSTEM

|   |                                    |
|---|------------------------------------|
| Graphite Tubes are pyrolytically coated & transversely heated upto 3000°C             |                                    |
| Platform tubes supplied as standard, capable of accepting volumes upto 20 µL          |                                    |
| Programmable graphite furnace upto 10 stages which can be set & stored using Software |                                    |
| Replacement of Graphite tube performed by a simple command using Software             |                                    |
| Graphite tube cooling by additional water circulatory system                          |                                    |
| Cd Sensitivity: 4x10 <sup>-12</sup> gm  |                                    |
| Safety Features   | 1. Argon Gas pressure sensor       |
|   | 2. Water Flow sensor               |
|   | 3. Over Temperature sensor         |
|   | 4. Broken Graphite Tube protection |



# AA8000 SPECIFICATIONS

## AUTOSAMPLER

The AA8000 Autosampler with Autodilution facility can be used with both Flame & Graphite Instrument Configurations with Dilution facility

### Flame System

|                           |   |
|---------------------------|---|
| Vial Capacity             | 38 positions  |
| Sample Vial Size          | 6 ml  |
| Standard Sample Vial Size | 12 ml   |
| Reproducibility           | Cu < 0.6% (air/acetylene) Cu < 1.0% (air/LPG) Ba < 1.0% (nitrous oxide/acetylene) |

Pressure Protection for Wash

Position Adjustment using Software

### Graphite System

|                    |                        |
|--------------------|------------------------|
| Vial Capacity      | 76 positions           |
| Sample Vial Size   | 1.5 ml                 |
| Modifier Vial Size | 12 ml                  |
| Upto 3 Modifier    | Additions              |
| Reproducibility    | Cu < 2.0 %, Cd < 2.0 % |

Pressure Protection for Wash

Position Adjustment using Software

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Manufactured in Technical Collaboration with PG Instruments (UK)



Striving to become the best individuals, we endeavour to foster the best team. Performing sensibly, we try to achieve the best efficiency. Working innovatively, we seek to make the best products. Listening patiently, we excel to offer the best service. So, no matter what your needs are, **come to us, GET THE BEST**

LABINDIA reserves the right to change specifications without notice as part of its continuous programme of product development.