



Wagtech Projects is one of the UK's largest independent manufacturers and suppliers of scientific testing and laboratory equipment.

From small orders for urgently required consumables through to complete laboratory installations, we regularly ship products to customers in more than 120 countries worldwide.

In addition, we recognise the need for local support, after sales service and product training, and have established an extensive network of local and regional offices, agents, distributors and subsidiary companies in many countries throughout the world.

**Wagtech Projects Ltd**

Wagtech Court | Station Road | Thatcham  
Berkshire RG19 4HZ | United Kingdom

**Tel:** +44 (0) 1635 872929

**Fax:** +44 (0) 1635 862898

**E-mail:** [sales@wagtechprojects.com](mailto:sales@wagtechprojects.com)



# INTRODUCTION

Wagtech Projects are a multi-award winning, privately owned, British based manufacturing company with a head office, manufacturing and central sales office in Thatcham, UK.

Wagtech Projects is now in its 30th year and has grown rapidly in the UK and globally with over 120 dealers.

Our concentrated team consists of highly skilled individuals from various backgrounds such as engineering, innovative product design, production, management, scientific research and software design. Our focus and vast skill set has enabled us to develop and successfully market an ever-increasing range of environmental testing solutions including highly precise water testing instruments.

Key to our success is the role played by our local and regional offices throughout the globe, offering After Sales support, local ICT and Technical assistance in country.



We aim to develop partnerships with government ministries, bilateral and multilateral donors, aid agencies, local and international businesses.





# **OUR PRODUCTS ARE USED BY SCIENTISTS, ENGINEERS AND TECHNICIANS WORKING IN RESEARCH, EDUCATION AND INDUSTRY COVERING:**

- Water Quality Testing
- General Environmental Monitoring
- Agriculture
- Health
- General Laboratory
- Construction
- Installation, Commissioning and Training
- Site Surveying
- Climate Monitoring Solutions
- International Projects and Tenders
- Mobile Laboratory Specialists
- Higher Education and Vocational Training
- Hydrology and Groundwater
- Meteorological Instrumentation

**Wagtech Projects' mission is to research, develop, manufacture, source and supply affordable high quality equipment within the specialist areas of environmental testing, agronomy, materials testing, education, scientific and laboratory applications.**

# THE WAGTECH PROJECTS CATALOGUES

Comprehensive resources designed to provide you with the latest and most efficient testing solutions for your requirements...



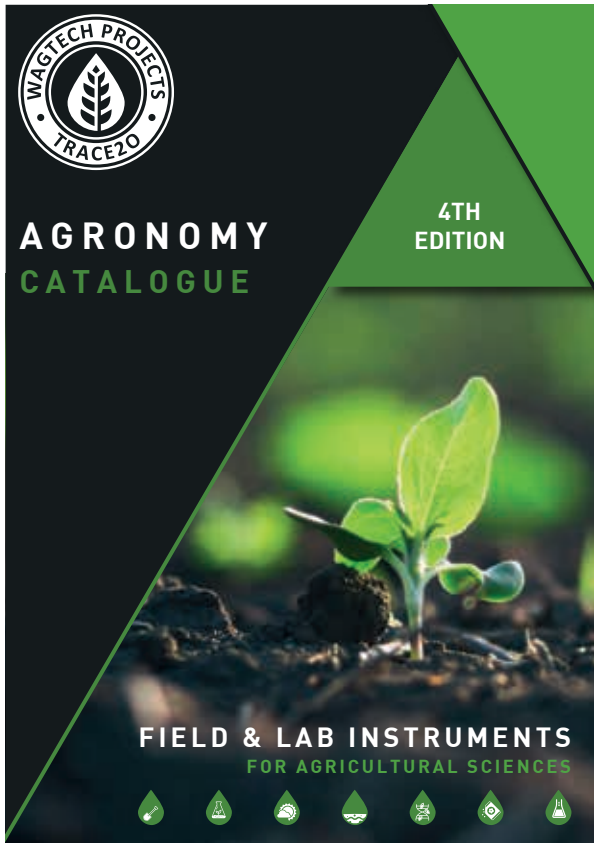
## ENVIRONMENTAL CATALOGUE

The Environmental Catalogue contains an extensive range of field and laboratory instruments for use by environmental scientists and technicians to sample and monitor water, soil, sediment, air, dust, global warming and noise pollution.

As global manufacturers of a wide range of portable water quality testing laboratories and reagents, we also supply environmental monitoring solutions that align with all current environmental issues. These come with an emphasis on hydrometeorological equipment such as weather stations that monitor changing climate conditions.

# THE WAGTECH PROJECTS CATALOGUES

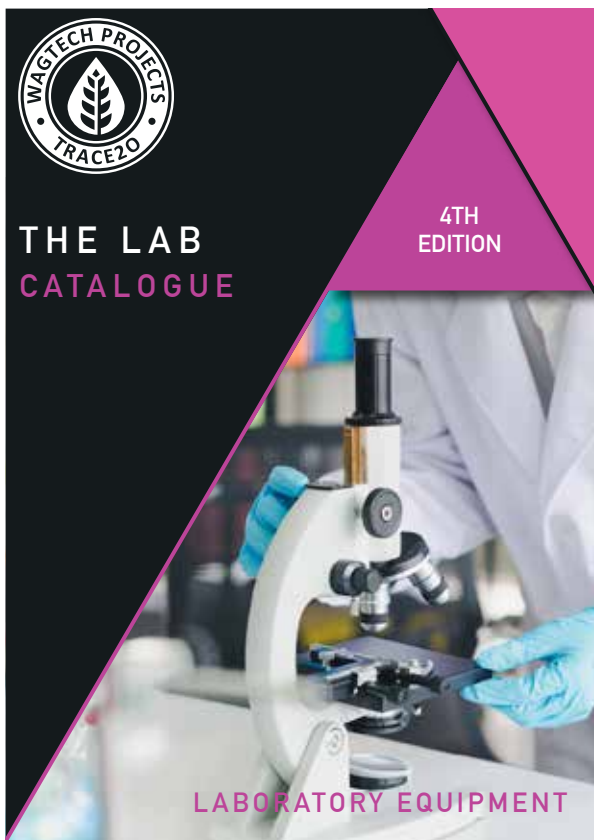
Comprehensive resources designed to provide you with the latest and most efficient testing solutions for your requirements...



## AGRONOMY CATALOGUE

The Wagtech Projects Agronomy line contains a wide range of the latest laboratory and field based testing equipment for use by experts involved in the cultivation and management of agricultural crops, plants and soil science applications.

Wagtech Projects regularly supply Agronomy equipment to National and Regional Agricultural Research Centres, Universities and Higher Education establishments, Vocational Training Centres, Seed Testing Laboratories, Crop Quality Control Laboratories, National Standards Bureaus, Private laboratories, and Specialist Consultancies.



## THE LAB CATALOGUE

Wagtech Projects offer a comprehensive range of Laboratory equipment, to fulfil your every requirement. We have selected over 40,000 products from educational teaching items through to high-end analytical instrumentation, to meet every available budget.

Using either our website's online search facility or simply browsing through our catalogue, we are confident you will find your required products quickly and easily.

# WAGTECH PROJECTS

The Wagtech Projects Agronomy line contains details and information on a wide range of the latest laboratory and field based testing equipment for use by experts involved in the cultivation and management of agricultural crops and plants such as Agronomists, Agricultural Scientists, Hydrologists, Engineers, Agro-meteorologists, and Farmers.

Wagtech Projects regularly supply Agronomy equipment to National and Regional Agricultural Research Centres, Universities and Higher Education establishments, Vocational Training Centres, Seed Testing Laboratories, Crop Quality Control Laboratories, National Standards Bureaus, Private laboratories, and Specialist Consultancies.





### **WATER QUALITY**

Wagtech Projects manufacture a wide range of portable water quality laboratories and kits which enable a full range of tests to be carried out according to WHO guidelines.



### **GENERAL ENVIRONMENTAL MONITORING**

Assessing the impact that changes in the environment have on our everyday lives involves sampling, measuring and analysing the soil, water, air, dust and noise pollution levels around us.



### **AGRONOMY**

Our brand new Agronomy Catalogue contains details and information on a wide range of the latest laboratory and field testing instruments.



### **GENERAL LABORATORY**

Wagtech Projects can offer a wide range of general laboratory equipment, glassware and consumables at competitive prices.



### **VOCATIONAL TRAINING**

Wagtech Projects handles the supply, installation and commissioning of equipment requirements in vocational training institutes, workshops, industrial training schools, and colleges.



### **INSTALLATION, TRAINING AND COMMISSIONING**

Wagtech Projects have a team of qualified engineers and technicians who are available for installation, commissioning and training around the world.



### **METEOROLOGY**

Wagtech Projects are specialists in automatic weather monitoring systems, automatic lightning detector systems and cloud based data monitoring and visualisation systems.



### **HYDROMET**

Providing you with facilities to monitor water levels and quality from a remote location, integrated early warning systems for flooding and cloud based data monitoring and visualisation systems.

# INTERNATIONAL NETWORK



## Office, Agents and Distributors

Wagtech Projects has its own offices, authorised dealers or distributors in many countries throughout the world.

All of them have the necessary skills and relevant experience to provide you with a wide range of services from providing equipment, spares, consumables and reagents to full after sales service and technical support.

Contact us for details of your nearest appointed agent or distributor.

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Catalogue Developed and Produced by Wagtech Projects.

Designed by Jabb Design.

Every effort has been made to ensure that the descriptions given in this catalogue were correct at the time of going to press, but we accept no liability for any error and the specifications are subject to change without prior notice.



# INTERNATIONAL PROJECTS AND TENDERS

## Calculated risks bring growth and development...

Compiling responsive and competitive tenders is a specialised process and for this reason, Wagtech Projects has a dedicated Projects Team in place which has developed an enviable record for success in international competitive bids and donor funded projects worldwide. Combining many years of industry related experience, this highly skilled team specialises in the sourcing, preparation and submission of international tenders and projects in new areas of Vocational Education, Health, Agriculture and Environmental projects.

## Continued commitment...

The division offers the opportunity for complete installation, commissioning and training to be provided in support of the equipment supply programme. Technical manuals are provided in the local language and local agents have the necessary expertise to provide a continued service over the long term.

## New challenges are new opportunities...

The Wagtech Projects Team are continuously broadening the company's horizons, discovering new areas of interest, and fundamentally improving the wholeness of the solutions that Wagtech has to offer. Wagtech is always actively seeking out new project partners particularly in areas of Vocational Education, Environment, Health and Agriculture.



# INTRODUCTION

Wagtech Projects is pleased to present our new Agronomy Catalogue which contains details and information on a wide range of the latest laboratory and field testing instruments for use by experts engaged on the cultivation and management of agricultural crops and plants.

Working in:

- National and Regional Agricultural
- Research Centres
- Universities & Higher Education
- Vocational Training Centres
- Seed Testing Laboratories
- Crop Quality Control Laboratories
- National Standards Bureaus
- Private Laboratories
- Specialist Consultancies

The catalogue is divided into the following sections:

- Physical Survey
- Soil Science
- Agrometeorology
- Hydrology and Groundwater
- Crop Science
- Seed Technology
- Forestry
- Laboratory Chemical Analysis

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## After Sales Support, Service & Training

This is an important feature of Wagtech Projects which we take very seriously. In addition to the support provided by our local companies, our team of agronomists, scientists and engineers make regular country visits and, for particular projects, dedicated site visits to install and commission equipment and to train the local experts in their use.

Please remember should you not find the particular product or specification you are seeking please contact us and our in house agronomists and engineers will be pleased to advise you on alternatives that may be available.



# GENERAL SURVEY



A full survey of a region is essential in determining the suitability of a particular ground for agricultural development. This section includes a basic range of instruments required to carry out essential survey work prior to any development project.

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The range includes both conventional field instruments and other items that are required for a full survey, including altimeters, inclinometers, binoculars, hand held GPS etc.



# SOIL SCIENCE

Soil Science is concerned with the study of soil as a natural resource, and in agricultural applications, this refers to assessing its properties in order to enable plants and crops to flourish. Information on soil characterisation is a key indication of how an ecosystem works.

The properties of soil horizons must be known in order for a prediction to be made on how fast water will take to move through them.

Soil properties also indicate as to whether or not the soil has the potential to store enough water to keep plants growing through a drought, to withstand a flood, and to provide the right combinations of chemicals to plants (as indicated in measurements of pH, and NPK levels) so that they will grow properly.



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## After Sales Support, Service & Training

Although certain physical and chemical tests require the use of specialised laboratory analytical equipment, many of the key properties of soil can be measured using a range of field testing instruments and kits.

A comprehensive range of this equipment is included within this section, covering the following:

- Soil Sampling
- Soil Classification
- Soil Analysis
- Soil Water Sampling
- Irrigation Water Quality Testing
- Soil Moisture and Permeability
- Soil Compaction



# AGROMETEOROLOGY

Information on weather conditions is essential for the modern farmer and agronomist. Although such information may be readily available from national meteorological offices, details of more localised conditions may not be, and such data is of vital importance to farmers to ensure their crops are protected and flourish. Local weather conditions can vary greatly from the national picture due to the aspect, altitude, and microclimate of a particular area.

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This section includes a range of automatic weather stations that are used for measuring all the standard parameters such as wind speed, wind direction, air temperature, relative humidity, solar radiation, and rainfall. In addition, some more specialised stations have also been included for Agrometeorology, Hydrological and Soil Conditions monitoring.



# HYDROLOGY & GROUNDWATER

Water is a precious agricultural resource and thus its careful monitoring is essential in order to ensure that it is used as effectively as possible. In any water resources assessment study, long term measurements of water quality, flow, level, and depth are crucial to produce accurate data for later processing and analysis. This section contains a comprehensive range of equipment that is widely used for measuring and recording such data.

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Contained within this section are items such as Flow Meters, Flumes, Dipmeters, Water Samplers, and Water Level Monitors. For a further range of equipment such as Multi-Parameter Water Quality Testers and Portable Echo Sounders, please refer to the our Environmental Catalogue, which is available upon request.

Our comprehensive range has been divided into the following sections:

- Current Flow monitoring
- Water Level Monitoring
- Geophysical Testing



# CROP & FOOD SCIENCE

Crop & Food Science is concerned with the scientific processes that serve to enhance and maintain the quality of crops. Plant related factors are as essential to effective crop productivity as the quality of soil. The purpose of crop science is to exemplify how plants use primary inputs such as water and solar energy, and to then provide methods and practices that serve to aid successful irrigation scheduling.

This section includes a range of automatic weather stations that are used for measuring all the standard parameters such as wind speed, wind direction, air temperature, relative humidity, solar radiation, and rainfall. In addition, some more specialised stations have also been included for Agrometeorology, Hydrological and Soil Conditions monitoring.

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The equipment listed covers the following fields:

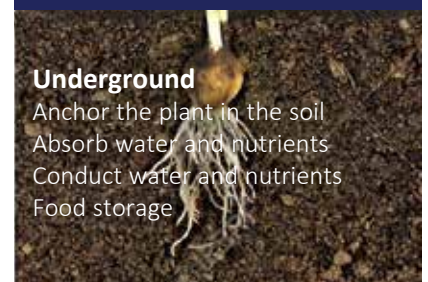
- Plant Physiology
- Microbiology
- Entomology
- Nematology
- Light Measurement
- Forestry Science

## THE SHOOT SYSTEM



**Above the ground** Includes the leaves and reproductive organs  
Elevates the plant above the soil  
Serve many functions including:  
photosynthesis reproduction  
and dispersal food and water  
conduction

## THE ROOT SYSTEM



**Underground**  
Anchor the plant in the soil  
Absorb water and nutrients  
Conduct water and nutrients  
Food storage



# SEED TECHNOLOGY

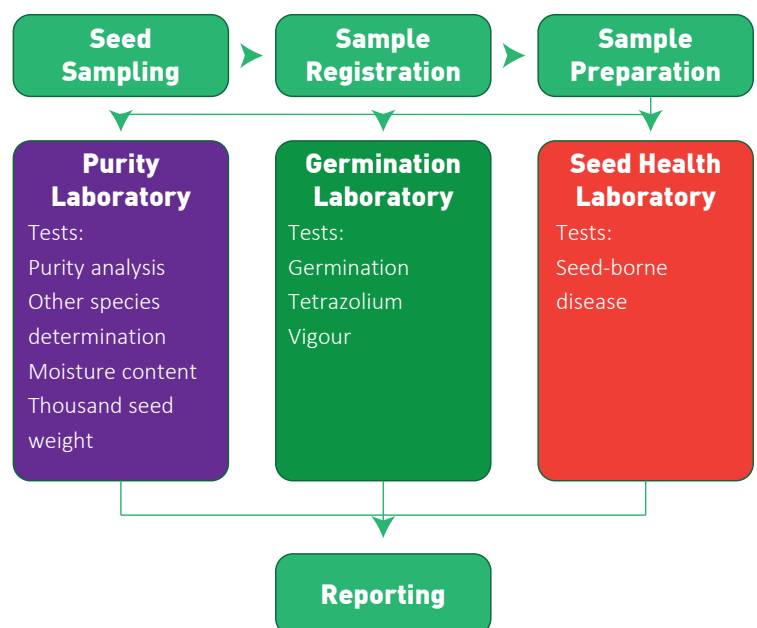
Seed Scientists and Seed Technologists have established standard procedures and tests to evaluate seeds. The various steps are highlighted in the diagram below, which make it possible to determine information on those important quality characteristics such as purity, uniformity, germination, moisture content, seed health etc.

The International Seed Testing Association (ISTA) accreditation has been prepared to meet specific needs of ISTA, its member laboratories and the International Seed Trade.

The ISTA rules for seed testing, published in Seed Science and Technology, form an integral part of the standard, as they constitute the methods which must be used for the issuance of ISTA certificates by accredited Seed Testing Laboratories.

Wagtech Projects has taken care to manufacture and supply equipment suitable for independent seed testing laboratories around the world. This equipment includes products for physical, biological and cultivator purity, incidence of noxious weed seeds, germination percentage, moisture and content etc.

After sample registration, seed samples are transferred to the Purity Laboratory. The Purity laboratory is responsible for sampling and preparation of samples before testing in any of the three disciplines, i.e. Purity Laboratory, Germination Laboratory, and Seed Health laboratory.







# LABORATORY CHEMICAL ANALYSIS

A wide range of specialised analytical and general laboratory equipment is required to carry out a full analysis of soil and plant material

This equipment can be summarised as follows:

- Atomic Absorption
- Spectrophotometry
- Gas Chromatography (GC)
- Spectrophotometry
- Flame Photometry
- Colorimetry
- Ion Selective Electrodes
- Microscopy
- Titration.
- Kjeldahl
- Soxhlet
- Dietary Fibre

Details of these instruments can be found in our General Laboratory Catalogue or in our Environmental Catalogue. However for research work involving soil and crops specific tests are required in particular for protein determination, extraction of fats and oils, and the analysis of dietary fibre. This section contains details of the instruments required to carry out these tests.

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## **Kjeldahl:**


Long established and widely used analytical technique for the determination of nitrogen/protein involving the Digestion, Distillation, and Titration of the sample material.

## **Soxhlet Apparatus:**

Used for the determination of oil and fat content in agricultural products.

## **Dietary Fibre:**

Agricultural products contain substances belonging to different categories: eg - carbohydrates, proteins, fats, mineral salts and fibres. The “fibre” consists of polymers (lignin, cellulose, hemicellulose, pectin) which are non-digestible for humans but nevertheless form part of a healthy diet. The equipment in this section is used to determine the levels of dietary fibre in agricultural products.



Wagtech have many years' experience in creating bespoke Mobile Laboratories, which are ideal for situations where central fixed laboratory sites are either not available or not practical.

We use many different brands and models of vehicles, from Land Rovers to Ford Rangers, to Toyota Hilux's and Land Cruisers, so that we can find a solution that meets not only your budget, but also your exact requirements.

The Wagtech range of Mobile Laboratories are specifically designed for each application and offer complete flexibility of design, including:

# Mobile Laboratories



# General Survey

General Survey

Soil Science

Agrometeorology

Hydrology

Crop Science

Seed Technology

Laboratory

General Survey: A full survey of a region is essential in determining the suitability of a particular ground for agricultural development. This section includes a range of instruments required to carry out essential survey work prior to an agricultural development project.

The range includes both conventional field instruments and other items that facilitate a detailed and accurate survey.

- Compasses
- Clinometers
- GPS Receivers
- Digital Planimeter
- Theodolites
- Automatic Level
- Line Locator
- Binoculars
- Land Measuring Wheel
- Levelling Staff

AG11-100



## Sighting Compass

These hand held sighting compasses represent the highest quality in precision, sensitivity and durability, offering the performance required by professionals. They have friction free sapphire jewel bearings with short settling time for quick and accurate readings. The compasses incorporate a 10x magnification precision ground sighting lens with a diopter sight for compass estimations to 1/4 of one degree. The Prismatic version combines the traditional features with a superbly clear and open to light prismatic sighting system. Due to its advanced construction, it is extremely easy to obtain accurate readings even when used in poor lighting conditions.

- Anodised aluminum housing with cord
- High quality glass lens for sighting
- 360° true bearing and 360° back bearing scales
- Precision scale aluminum compass card

| Catalogue No | Description  |
|--------------|--|
| AG11-100     | Model: Prismatic   |
|              | Sighting system: Open light Parallax lens, 10x magnification         |
|              | Compass card: Transparent compass card with precision scale          |
|              | Accuracy: 0.33°  |
|              | Capsule: Anti-static liquid filled for optimal dampening of the card |
|              | Weight, g: 115   |
|              | Weight, g: 75 x 52 x 15  |



## Clinometer

AG11-120

This type of handheld Clinometer/ heightmeter is perfect for quickly and very accurately measuring vertical angles/ heights. Typical users of this kind of instrument are: foresters, geologists, engineers, telecom, pylon erectors, overhead cable management, miners, crane operators, architects, surveyors, and others who have to measure vertical angles/heights in forests, city, quarries, mines, caves, buildings etc. Available with different angle/ heigh scale depending on user category. The instrument is very easy to use and comes complete with full instructions.

- 10x magnification parallax-free lens provides distortion-free readings
- Liquid damped for quick and accurate readings
- Inch and metric scales, instructions and lanyard included

| Catalogue No    | Description  |
|-----------------|--|
| <b>AG11-120</b> | Model: Prismatic   |
|                 | Sighting system: Open light Parallax lens, 10x magnification         |
|                 | Compass card: Transparent compass card with precision scale          |
|                 | Accuracy: 0.25°  |
|                 | Capsule: Anti-static liquid filled for optimal dampening of the card |
|                 | Weight, g: 110   |
|                 | Dimensions, mm: 75 x 52 x 15   |



## Compass Clinometer

AG11-142

This hand held instrument uniquely provides a combination of both the Sighting Compass and the Clinometer. The unit is especially well suited for professionals who need to measure vertical angles/heights and compass bearings. The Prismatic combines the original features with a superbly clear and open to light prismatic sighting system. Due to its construction, it is extremely easy to obtain accurate reading even when in dark conditions.

The unit is equipped with a top scale for direct readings on the top of the card. Sapphire jewel bearings are used for friction free movement of the card, allowing for fast and accurate readings.

- Two instruments in one
- Easy to read due to the open to light, crystal-clear scales
- Quick setting time due to the liquid damped scales
- Extremely accurate readings

| Catalogue No    | Description  |
|-----------------|--|
| <b>AG11-142</b> | Model: Prismatic   |
|                 | Sighting system: Open light Parallax lens, 10x magnification         |
|                 | Compass card: Transparent compass card with precision scale          |
|                 | Accuracy: 0.25°  |
|                 | Capsule: Anti-static liquid filled for optimal dampening of the card |
|                 | Weight, g: 175   |
|                 | Dimensions, mm: 120 x 76 x 15  |



## Measuring Tape

AG11-800

- 13mm wide blade
- 3:1 rewind ratio for return
- Metric and imperial markings

| Catalogue No    | Description                      |
|-----------------|----------------------------------|
| <b>AG11-800</b> | Measuring tape, 30 metre length  |
| <b>AG11-802</b> | Measuring tape, 50 metre length  |
| <b>AG11-804</b> | Measuring tape, 100 metre length |





AG11-160



## Mirror Compass with Inclinometer

A sighting compass for really advanced users. Specially designed to simplify map work. Scale markings for measuring co-ordinates and built in magnifier. Also equipped with luminous markings in the housing, on the needle and on the baseplate, for difficult navigation in the dark.

This is a classic, detailed sighting compass with magnifying mirror and sighting hole at the lower edge of the mirror for the most accurate bearings. With Silicon rubber feet on the baseplate for best friction on map when taking bearings, magnifier and measuring scales in millimeters and inches. Also equipped with Romer scales (1:50.000 and 1:25.000) for plotting positions on maps and mm/ inch map measuring scales. Built-in magnifying lens and luminous markings for night navigation, as well as permanent compensation for magnetic declination and a clinometer for inclined angles are other important features for the most demanding users.

- Built in clinometer and a magnetic declination adjuster for measuring vertical angles
- Lid with large sighting mirror
- Exceptional performance in all conditions

| Catalogue No    | Description                             |
|-----------------|---|
| <b>AG11-160</b> | Sighting method: Mirror, notch and hole |
|                 | Accuracy: 2°                            |
|                 | Dimensions: 65 x 101 x 18               |
|                 | Weight: 74g                             |

AG11-180



## Altimeter/Barometer

This is a classic hand held altimeter/barometer which shows both the absolute barometric pressure as well as the altitude above sea level and height differences. Calibration is made easy by simply turning the altimeter scale ring.

The unit comes with a click on lanyard and the design and friction treatment of the body provides a perfect hand-fit both with and without gloves.

| Catalogue No    | Description                 |
|-----------------|-----------------------------|
| <b>AG11-180</b> | Units of measure: M/Hpa     |
|                 | Altitude range: 0-5000m     |
|                 | Pressure range: 580-1040Hpa |
|                 | Accuracy: ±30m              |

### NOTE:

A further range of surveying equipment is available upon request.



## GPS Receiver

AG11-200

The GPS Receiver is a tough and rugged piece of equipment suited to all types of terrain. It has a highly-sensitive WAAS/EGNOS-enabled receiver which holds a GPS signal in the toughest conditions. It has a bright colour screen, barometric altimeter, electronic compass, microSD and automatic routing.

- Power supply 2 x AA batteries
- Transflective, 65-K colour screenTFT
- USB compatible
- Rugged and weater proof case
- Water resistant to IEC-529, IPX7 standards
- 25 Hours battery life
- Store up to 200 Routes, 2000 waypoints, 10,000 points and 200 saved tracks

| Catalogue No | Description                     |
|--------------|---------------------------------|
| AG11-200     | Receiver: 12 channel            |
|              | GPS Antenna: Patch              |
|              | Acquisition time: 0:15 - 0:45   |
|              | Accuracy: <15m                  |
|              | Internal memory: 24MB           |
|              | Number of waypoints: 1000       |
|              | Number of tracking plots: 10000 |
|              | Weight, g: 156                  |
|              | Dimensions, mm: 111 x 50 x 30   |



## Digital Planimeter

Planimeters are excellent tools to use when measuring irregular-shaped areas on plans or drawings. They eliminate the need for grids, charts, or calculations to be done by hand.

This is a very precise instrument used for quick and accurate determination of areas on blueprints, maps, photographs and drawings. Simply follow the outline of the area with the tracer. The revolution of the measuring wheel to either direction is sensed by the electro shaft-encoder which generates pulses to be processed by the built-in processor.

- Cordless operation - powered by rechargeable Ni-Cad battery
- Direct digital readout of traced area in cm<sup>2</sup> , m<sup>2</sup> , km<sup>2</sup> , inch<sup>2</sup> , ft<sup>2</sup> .  
No table references, no calculations
- Accumulative measurement of different areas
- Push button averaging of several measurements of the same area
- 'Hold' function freezes readout to prevent accidental loss of result
- Measures drawings when vertical scale differs from horizontal scale

AG11-300

| Catalogue No                   | Description   |
|--------------------------------|---|
| AG11-300                       | Measuring range: 3000mm x 300mm                       |
|                                | Accuracy: Better than ±2% (±2/1000 pulses)            |
|                                | Resolution: One digit corresponds to 1mm <sup>2</sup> |
|                                | Operating Hours: 30 hours                             |
|                                | Internal memory: LCD with zero suppression            |
|                                | Weight approx: 650g                                   |
| Dimensions, mm: 150 x 240 x 39 |   |





AG11-400



## Electronic Theodolite

Designed for enhanced reliability in construction applications, advanced features let the contractors work faster and longer, in proving productivity and increasing profitability. Automatic vertical compensator with 2" horizontal and vertical readout. Precision dual LCD panels with large, easy to read numbers. Vertical angle measuring provides three different options plus percentage of grade. Auto power off option, laser plummet, zero resetting, removeable tribach for multiple setups.

Rugged IP54 protection - water resistant, sealed construction. Theodolite is supplied complete with, Laser Plummet, Carrying Case, Plumb Bob, Rechargeable Battery, Charger, Alkaline Battery Holder and Tools Set.

| Catalogue No    | Description  |
|-----------------|--|
| <b>AG11-400</b> | <b>Telescope</b>   |
|                 | Image: Erect image   |
|                 | Magnification: 30x   |
|                 | <b>Display</b>   |
|                 | Display screen: LCD  |
|                 | Operating temperature:-20°C to +45°C                           |
|                 | Operating time: 8 hours  |
|                 | Power source: Re-chargeable Ni-H battery. 8 hours running time |
|                 | Weight, kg: 5.2  |
|                 | Dimensions, mm: 160 x 150 x 330                                |

### Accessories

| Catalogue No    | Description                                     |
|-----------------|---|
| <b>AG11-402</b> | Description: Budget Aluminum Tripod- Quick Lock |
|                 | Height/ Weight: 0.98m- 1.65m / 3.7kg            |

AG11-450



## Optical Theodolite

This is a compact, low height unit that is ideally suited to the alignment of pillars, masts, scaffolds, sheathings and elements, as well as for simple pegging tasks and levelling. The low height and compact design of this Theodolite make it an indispensable piece of equipment in all surveying applications. The unit is supplied in a fully portable and rugged case.

- Practical system of control and reading guarantees fast and safe operation
- Fast transit telescope with 20x magnification
- Erect and on-reversed telescope image
- Cross lines grid with double and single lines for exact target location and distance lines for optical distance measuring
- Optical peep sights in both telescope positions to facilitate rough pointing

| Catalogue No    | Description                            |
|-----------------|--|
| <b>AG11-450</b> | <b>Telescope</b>                       |
|                 | Image position: Erect and true-to-side |
|                 | Magnification: 20x                     |
|                 | View field angle: 2° (3.5m/100m)       |
|                 | <b>Temperature</b>                     |
|                 | Operating range:-20°C to +50°C         |
|                 | <b>Instrument</b>                      |
|                 | Weight, kg: 1.2                        |
|                 | Dimensions, mm: 260 x 140 x 140        |

### Accessories

| Catalogue No    | Description                                     |
|-----------------|---|
| <b>AG11-402</b> | Description: Budget Aluminum Tripod- Quick Lock |
|                 | Height/ Weight: 0.98m- 1.65m / 3.7kg            |



## Automatic Level

Many rural and agricultural applications require accurate information concerning the differences in levels between two or more points. Typical examples include pipelines, irrigation design, water supplies, drainage design and road building.

This reliable instrument is compact, portable and easy to use.

The design allows for the instrument to be quickly and easily fitted upon a tripod. The Level is ideally suited for building construction, transferring elevations, excavations, setting grades/lines, and establishing foundation elevations.

- Sealed structure is totally waterproof
- Excellent shockproof function
- Exclusive closed magnetic field, magnetically dampened compensator
- Friction-braked rotation and endless horizontal drive
- Prism for viewing circular vial
- Water, dust and dirt proof

Level is supplied complete with tripod and 5m levelling staff.

| Catalogue No    | Description                            |
|-----------------|--|
| <b>AG11-500</b> | SD for 1km double run levelling: 2.5mm |
|                 | Image: Erect                           |
|                 | Magnification: 20x                     |
|                 | Objective aperture: 36mm               |
|                 | Field of view: 1° 20'                  |
|                 | Minimum focus: 0.8m                    |
|                 | Multiplication constant: 100           |
|                 | Compensation range: ±15'               |
|                 | Compensation setting accuracy: ±0.5"   |
|                 | Weight (Level, Tripod & Staff): 10kg   |
|                 | Dimensions, cm: 30 x 30 x 120          |

## Accessories

| Catalogue No    | Description   |
|-----------------|---|
| <b>AG11-502</b> | Standard Aluminium Tripod. Collapses to 1.02m, extends to 1.62m. Weight 4.2kg |

## Pocket Binoculars

Pocket Binoculars are a useful accessory for any package of surveying equipment. The general terrain can be examined, prominent landscape features noted and the survey route planned, whilst they are easily stored in pockets. These small, lightweight binoculars are very practical to have with you at all times. Rubber-coated and with anti-reflection coated optics, these Binoculars offer exceptional quality for their size.

| Catalogue No    | Description               |
|-----------------|---------------------------|
| <b>AG11-600</b> | Pocket Binoculars 8 x 20  |
| <b>AG11-602</b> | Pocket Binoculars 10 x 25 |

## Pocket Stereoscope

Designed for the interpretation of aerial photographs, this pocket stereoscope facilitates the clarification of contours, and enables measurements to be made of essential features so that detailed maps of the region can be made. The unit is equipped with an impact resistant plastic frame with metal folding legs.

| Catalogue No    | Description                        |
|-----------------|------------------------------------|
| <b>AG11-620</b> | Interpupillary range, mm: 55 to 75 |
|                 | Field of view, mm: 125 x 125       |

AG11-500



AG11-502



AG11-600



AG11-620







AG11-650



## Land Measuring Wheel

Featuring an extra rugged construction, this measuring wheel has been specifically designed for use over agricultural land and other rough terrain. The handle can be removed and folded away for easy storage.

- Robust solid tyre fitted to spoke wheel
- Heavy duty counting head fitted directly to wheel
- Five figure counting head, 7mm high figures
- Scraper to prevent mud build up on wheel
- Adds forwards, subtracts in reverse

| Catalogue No    | Description                        |
|-----------------|------------------------------------|
| <b>AG11-650</b> | Accuracy: $\pm 5\%$<br>Weight: 5kg |

AG11-670



## Levelling Staff

Lightweight aluminium levelling staff with 5 durable telescopic connectable sections and English 'E' style metric markings.

| Catalogue No    | Description        |
|-----------------|--------------------|
| <b>AG11-670</b> | 5m Aluminium Staff |

AG11-700



## Survey Rods

1 and 2 metre survey rods. The rods are 27mm in diameter and are constructed of reinforced glass fibre.

| Catalogue No    | Description  |
|-----------------|--|
| <b>AG11-700</b> | 1 metre survey rod.  |
| <b>AG11-702</b> | 2 metre survey rod. PVC plastic covering and solid steel point |



# Unique Solutions...

Wagtech Projects provide a range of bespoke Portable Testing Kits:

- Soil Survey Kit
- Agricultural Inspectors Kit
- Irrigation Water Test Kit
- Plant Tissue Analysis Kit
- Soil pH Kit
- Soil Fertility Kit
- Soil Nutrients Kit
- Soil Analysis Kit



# Soil Science

General Survey

Soil Science

Agrometeorology

Hydrology

Crop Science

Seed Technology

Laboratory

**Soil Science** is concerned with the study of soil as a natural resource, and in agricultural applications, this refers to assessing its properties in order to enable plants and crops to flourish. Information on soil characterisation is a key indication of how an ecosystem works. The properties of soil horizons must be known in order for an accurate prediction to be made on how fast water will take to move through them (permeability).

**Soil Sampling & Classification** is required to determine the physical and chemical characteristics of a particular area or plot required for agricultural development.

The equipment in this section will enable disturbed and undisturbed samples to be taken away for later analysis in the laboratory.

AG21-050



## Soil Survey Kit

A self contained soil survey kit comprising a comprehensive range of specialist equipment, that is designed to provide the soils specialist with all the equipment required for soil sampling, classification, basic chemical analysis, and soil compaction.

- Hand held GPS
- 50m measuring tape
- Dutch and Riverside hand auger kits, 55mm and 75mm diameter, depth to 6m
- Surface soil sampler
- Soil colour charts
- Soil texture kit
- Range of soil sieves
- Pocket soil Penetrometer
- Soil analysis kit for NPK
- Field handbook

| Catalogue No | Description     |
|--------------|-----------------|
| AG21-050     | Soil Survey Kit |



## Agricultural Inspectors Kit

Supplied in a purpose built aluminium carry case this kit possesses the unique ability for the user to carry out the full range of seed and soil quality testing procedures all in one fully portable system. Ideally suited to farmers who require an on the spot determination of the quality of both seeds and soils.

### Contains the following components:

- Grain Moisture Meter, 0-100 Relative scale and digital readings for 15 pre-programmed crop calibrations
- Soil Moisture Probe with a range of 0-1bar negative pressure
- N-P-K Soil Testing Kit, sufficient for 50 tests
- Tropical Soils Colour Chart
- Set of 5 stainless steel, agricultural sieves with lid and receiver
- Hand Held GPS system for the accurate recording and measurement of bearings and positioning
- Sack Spear Sampler for grain, 12.7mm diam. x 650mm long, single slot, protective cover
- Soil Auger
- 2 x Plastic Sample Bottles
- Pack of 25 re-sealable Polyethylene Bags
- Hand Held magnifying Glass

### Grain Moisture Meter

Easy to use, lightweight and portable, this meter is ideal for measuring moisture content in a wide range of crops.

### Soil Moisture Probe

A robust soil tensiometers which is used to measure the moisture available within the soil for plant growth. An important tool for use in irrigation scheduling.

### NPK Soil Test Kit

A simple test kit used for measuring the key nutrients in the soil essential for plant growth:

**N** - Nitrogen: promotes the growth of leaves and vegetation

**P** - Phosphorous: promotes root growth

**K** - Potassium: promotes flower and fruit growth

Other items in the kit will help to take samples and classify soil and crops.

Finally, a hand held GPS survey unit is included to enable the inspector or farmer to log their survey position accurately using 21st century technology.



| Catalogue No | Description                 |
|--------------|-----------------------------|
| AG21-100     | Agricultural Inspectors Kit |

### NOTE:

You can find all these items sold as individual components throughout the rest of our catalogue.



AG21-150



### Hand Auger Kit

A comprehensive set for augering all types of soil down to a depth of 8-10 metres. These kits are specifically designed for use in soil research studies and are made to a high standard to ensure a long service life.

**Clip-on connection:** The advantage of the clip-on connection is that it is very fast with little weight. The clip-on connection is strong, rigid and long lasting

**Hand Auger Kit consisting of:**

- 6 x 1 metre clip-on rods
- 1 x Driving Handle
- 2 x Dutch Hand Augers S/L (55mm and 75mm diameter)
- 7 x Slide Tubes for clip-on rods
- 1 x Short tube for clip-on rods
- 1 x Solid clip-on adapter for driving handle

| Catalogue No | Description                                     |
|--------------|---|
| AG21-150     | Hand Auger Kit: depth 6m, 55 and 75 mm diameter |

AG21-200



### Professional Auger Kit

Professional soil sampling kits which are designed for soil sampling professionals who want the strongest, most durable connection.

These professional augers feature threaded connection and have thick cutting teeth with stronger welds. The kits come with either a 55mm or 80mm threaded professional regular auger and mud auger, as well as four 1.2m extensions, cross handle. All of the components fit into an included deluxe carrying case with handles and wheels for added portability.

| Catalogue No | Description                 |
|--------------|-----------------------------|
| AG21-200     | 55mm Professional Auger Kit |
| AG21-202     | 80mm Professional Auger Kit |

AG21-600



### Soil Colour Chart

The Munsell Soil Chart is an affordable way to evaluate the type of soil that is present in a given area, the book is set up to allow users to make soil colour evaluations in the field quickly and easily. Practitioners from a wide range of professions can share reliable and consistent information about the colour of soils at a particular site with colleagues anywhere around the world.

| Catalogue No | Description   |
|--------------|---|
| AG21-600     | Soil colour chart. Complete with supplementary tropical soil charts |

General Survey

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## Surface Soil Sampling Kit

AG21-300

This kit enables surface soil samples to be taken using the In-situ density, core cutter method detailed in BS1377 part 9.

The following items are included in the kit :

- Core Cutter 100mm diameter x 130mm long x 3
- Core Cutter Driving Dolly 100mm - 1
- Core Cutter Driving Rammer 100mm with steel rod and handle - 1
- Spatula with 200mm stainless steel blade - 1
- 300mm Straight Edge Trimming Blade - 1



| Catalogue No | Description           |
|--------------|-----------------------|
| AG21-300     | Sample ring kit, 53mm |

## Soil Coring Kit

AG21-400

This soil coring kit allows sampling for environmental research of soil containing volatile components. During sampling the sample is pushed into the sample tube upon which the tube is shut off. This will optimally prevent volatilisation and oxidation of the soil sample.

- Prevents loss of volatiles during sampling
- Prevents loss of volatiles during transport
- No hassle in the field with methanol
- Can be combined with methanol method
- Can be hammered in hard soils
- All parts except caps can be decontaminated over and over

This soil coring kit, used to establish the presence of volatile components, is suitable for augering down to a depth of 5m. The set contains an Edelman auger, the Riverside auger, extension rods, 1x extension rod 50 cm, 1x push-pull handle, handle with grip, sample tubes, filling blocks, caps, insulation plates, coring apparatus, handle with beating head, sample extruder for sample tube, utility probe, down-the-hole hammer, maintenance items and various accessories in a transport case. The set has a total weight of 41.5kg.



| Catalogue No | Description   |
|--------------|---|
| AG21-400     | Soil Sampler, T-handle with extension rod, 38mm dia. 900mm long |

## Soil Prospecting Kit

AG21-500

A complete set of soil prospecting equipment contained within a tough, durable and fully portable carrying case make this the ideal kit for soil prospecting applications in field studies. Maximum depth of 15 metres, for sample sizes of 25mm diameter.

The kit comprises the following items:

- 10 x 1 metre long Boring Rods
- 2 x Driving Points
- 12 x Couplings
- Driving Head
- Core Tube
- Clearing Rod
- 2 x Wrenches
- Clay Core Tube
- Core Tube Adaptor
- Spiral Auger Tool
- Lifting Tool
- Prospecting Hammer
- Hammer and Tommy Bar



| Catalogue No | Description          |
|--------------|----------------------|
| AG21-500     | Soil Prospecting Kit |



AG21-700



## Soil Texture Kit

Soil texture refers to the proportionate distribution of the different sizes of mineral particles within a soil. Particles are grouped according to their size into what are called 'size separates' (clay, silt, and sand). Soil separates are a group of mineral particles that fit within definitive size limits expressed as diameter in millimetres.

Included in this set, are three calibrated conical tubes with a stand, in addition to dispersing reagent and flocculating reagent that work together to speed settling of finely divided particles. Instructions explain method for breaking down soil samples into sand, silt and clay fractions. "A Study of Soil Science" provides background information on weathering and its relationship to soil formation. Provides for 50 tests.

| Catalogue No | Description  |
|--------------|--|
| AG21-700     | Soil texture kit.  |
| AG21-702     | Soil texture kit refill pack. Provides reagents for 50 tests |

AG21-800



## Agricultural Soil Set

Soil sieve set providing a fast and effective means for the coarser components to be separated from a dry sample in order for preliminary analysis to be undertaken on site. The Alloy nesting sieves are 125mm in diameter and have round hole openings of sizes 0.5mm, 1mm, 2mm, 3mm and 5mm diameter. With lid and receiver, weight 4kg.

| Catalogue No | Description                 |
|--------------|-----------------------------|
| AG21-800     | Agricultural soil sieve set |

AG21-810



## Soil Sieve Set

Supplied as a complete set comprising of a broad range of sieve sizes with a lid and pan. 10 no sieves in the set with aperture sizes 2mm, 900mic, 600mic, 400mic, 250mic, 200mic, 140mic, 125mic, 100mic, 63mic. Pan diameter 100mm, pan height 45mm.

| Catalogue No | Description           |
|--------------|-----------------------|
| AG21-810     | Set of 10 soil sieves |

### NOTE:

For a further range of Sampling Equipment, please refer to General Lab Catalogue.



## Motorised Sieve Shaker

AG21-850

This is a simple, and low cost Sieve Shaker, ideal for both site and laboratory use.

It incorporates an electric motor to provide an effective sieving action. This unit will accept 200, 250, 300 and 315mm, 8 and 12 inch diameter sieves. The shaker can hold up to eight 200mm diameter sieves or seven 300mm diameter sieves.

It is fitted with a 0 to 60 minute timer. Wet sieving kits in the appropriate sizes may be used with this shaker.

| Catalogue Number: | Description   |
|-------------------|---|
| <b>AG21-850</b>   | Sieve sizes accepted: 200mm, 250mm, 300mm, 315mm, 8inch, 12inch |
|                   | Timer: 0-60m  |
|                   | Rating: 110W  |
|                   | Power Supply: 220-240V 50Hz 1ph                                 |
|                   | Dimensions, mm: 350 x 400 x 950                                 |
|                   | Weight: 24kg  |



AG21-900

## Soil Sampling Bags

A set of 100 plastic bags that are used for the submission of samples for analytical assessment. The bags have a wire closure designed for sampling of soils and other materials.

| Catalogue No    | Description              |
|-----------------|--------------------------|
| <b>AG21-900</b> | Dimensions, mm: 75 x 125 |
|                 | Pack quantity: 100 bags  |



# SOIL CONDITIONS MONITORING SYSTEM

Soil Conditions Monitoring System with a 9 channel datalogger that has been specifically designed for use by farmers, soil scientists and agronomists to measure soil temperature, soil water potential and soil moisture using the following sensors:

- 1 x soil temperature sensor, 3m cable
- 3 x 60cm tensiometers, 3m cable
- 3 x gypsum block sensors, 3m cable

**AG31-500**





## A comprehensive range of laboratory equipment can be found in our Wagtech Projects General Laboratory Equipment Catalogue.

This contains products made by leading manufacturers certified to ISO 9001 quality standard, supplied and shipped to your nominated destination.



General Survey

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# Soil Analysis

Soil Analysis: Measuring the key chemical characteristics of the soil is essential in order to be able to create the best conditions for good plant growth.

This section includes a wide range of field testing kits and instrumentation for measuring the pH of the soil plus major nutrients such as Nitrogen, Phosphorus & Potassium.

## Soil pH Kit

A dual purpose kit measuring both soil pH and lime requirement. The pH test uses a single tablet reagent in conjunction with the pH (colour comparison) block. The lime requirement test uses a single buffer tablet and is carried out as a continuation of the pH test. The kit is supplied in a small plastic carrying case and contains sufficient tablet reagents for 50 soil pH and lime requirement tests.

| Catalogue No | Description                            |
|--------------|--|
| AG22-100     | Soil pH Kit                            |
| AG22-102     | Refill pack for Soil pH kit, 50 tests. |

AG22-100



## Soil Fertility Kit

The Soil Fertility Kit provides the analysis required for the routine assessment of agricultural soils and soil fertility. The tests include pH, nitrate, phosphate and potassium (NPK).

Rapid field tests are made possible by the extraction and reagent tablets in the kit which is suitable for use in the field, on the farm or in the laboratory. Supplied in a carrying case and containing sufficient extraction and reagent tablets for 50 each of the tests.

| Catalogue No | Description                                       |
|--------------|---|
| AG22-300     | Soil Fertility Kit                                |
| AG22-302     | Refill soil extraction and reagent pack, 50 tests |

AG22-300



## Soil Nutrients Kit

This kit contains an additional range of tests to assist farmers with soil management operations.

The Soil Nutrients Kit includes all the extraction and tablet reagents required for 50 tests of the following: nitrate nitrogen, phosphate, potassium, (NPK), calcium, magnesium, pH, and conductivity - supplied in carrying case.

| Catalogue No | Description                                       |
|--------------|---|
| AG22-400     | Soil Nutrients Kit                                |
| AG22-402     | Refill soil extraction and reagent pack, 50 tests |

AG22-400





AG22-410



## The Soil Analysis Kit

This comprehensive soil analysis kit is designed for use by farmers, horticulturalists, agronomists, scientists and consultants in the field or laboratory and will enable a range of tests to be carried out at a fraction of the cost of full scale laboratory analysis. Increased accuracy is ensured by the use of digital meters and a photometer which, together with extraction and reagent tablets for 50 tests, will measure the following parameters: pH, conductivity, nitrate nitrogen, phosphate phosphorus, potassium, sulphate, iron, manganese, copper, ammonia nitrogen, chloride, calcium, and magnesium - supplied in carrying case.

| Catalogue No    | Description   |
|-----------------|---|
| <b>AG22-410</b> | Soil Analysis Kit including accessory pack                              |
| <b>AG22-411</b> | Refill soil extraction and reagent pack for Soil Analysis Kit, 50 tests |

AG22-413



## Agriculture Test Kit

Soil Test kit allows you to test and measure the key parameters in soil for healthy plant growth. Namely Nitrogen, pH, Phosphorous and Potassium. In Agricultural applications, monitoring the quality of the soil is extremely important for the healthy growth of crops. The pH level is an excellent guide as to which plants may thrive in a particular terrain, as well as indicating which conditioners and fertilizers to use. Soil test kits allow you to test not only for pH, but for Nitrogen, phosphorous and potassium as well, which are all important for the quality of soil.

Agriculture test kit is supplied with an extraction solution which facilitates the precipitation of suspended solids so that measurements can be taken immediately. The kit includes everything you need to carry out 25 tests and includes a useful guide to measurement.

Parameter: Nitrogen, Range: traces, low, medium, high, Method: Colormetric, Chemical Method: Ned. pH, 4 to 9pH (1 pH increments), Colorimetric, pH indicator. Phosphorus traces, low, medium, high, Colorimetric, Ascorbic Acid. Potassium traces, low, medium, high, Turbidimetric, Tetraphenylborate

| Catalogue No    | Description  |
|-----------------|--|
| <b>AG22-413</b> | Description: Agriculture Test Kit                  |
|                 | Dimensions/ Weight: 113 x 113 x 62 mm Weight 105 g |

AG22-414



## Budget Soil Test Kit

Soil test kit is ideal for testing and monitoring the quality of the soil. pH level is an excellent guide as to which plants may thrive in a particular terrain, as well as indicating which conditioners and fertilizers to use. Combination test kits allow you to test not only for pH, but for nitrogen, phosphorous and potassium as well, which are important for the quality of soil.

The kit comes with all the necessary components for 25 tests.

Parameter: Nitrogen, Range: traces, low, medium, high, Method: Colormetric, Chemical Method: Ned. pH, 4 to 9pH (1 pH increments), Colorimetric, pH indicator. Phosphorus traces, low, medium, high, Colorimetric, Ascorbic Acid. Potassium traces, low, medium, high, Turbidimetric, Tetraphenylborate.

| Catalogue No    | Description   |
|-----------------|---|
| <b>AG22-414</b> | Description: Budget Soil Test Kit                   |
|                 | Dimensions/ Weight: 113 x 113 x 62 mm, Weight 105 g |



## Compact ION Meters

AG22-500

The only pocket meter that directly measures ion concentration in 0.3ml or smaller samples. Unique sensor allows measurement of viscous liquids, solids, and even powder samples. No need for a beaker to calibrate your meter or measure a sample. Just place a few drops of the standard or sample onto the flat sensor. This procedure saves you time and prevents wasting your precious sample.

- IP67 dust and waterproof
- Up to 2 calibration points
- Wide measuring range
- Flat sensor enables measurements of small sample volumes
- Selectable analysis of nitrate or nitrite as nitrogen
- Selectable units of measure (ppm, mg/L, kg/10a)

### Specifications

| Principle Method:  | Sodium ion electrode              | Potassium ion electrode           | Nitrate ion electrode             |
|--------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| Display:           | Custom digital LCD with backlight | Custom digital LCD with backlight | Custom digital LCD with backlight |
| Battery:           | 400 hours continuous use          | 400 hours continuous use          | 400 hours continuous use          |
| Range, ppm:        | 2-9900                            | 4-9900                            | 6-9900                            |
| Accuracy:          | +/-10%                            | +/-10%                            | +/-10%                            |
| Min Sample Volume: | 0.3ml                             | 0.3ml                             | 0.3ml                             |

### Catalogue No

### Description

|                 |                              |
|-----------------|------------------------------|
| <b>AG22-500</b> | Compact Ion Meter, Sodium    |
| <b>AG22-502</b> | Compact Ion Meter, Potassium |
| <b>AG22-504</b> | Compact Ion Meter, Nitrate   |
| <b>AG22-506</b> | Compact Ion Meter, Salt      |

## Accessories

### Catalogue No

### Description

|                 |   |
|-----------------|---|
| <b>AG22-508</b> | Standard solution set for Sodium meter    |
| <b>AG22-510</b> | Standard solution set for Potassium meter |
| <b>AG22-512</b> | Standard solution set for Nitrate meter   |
| <b>AG22-514</b> | Standard solution set for Salt meter      |

## Compact pH Meter

AG22-600

Incorporating flat sensors, these compact pH meters are able to take accurate pH value (acidity - alkalinity) measurements from a single drop sample.

The unique flat sensor allows measurements of powder and solid object samples to be easily taken. The unit comes complete with standard solution sets for pH4 and pH7. Replacements are available on request.

- Measurements may be taken from a single drop (0.1mL) sample solution
- Light, easy-to-clean, and waterproof Twin pH meters are suitable for a wide range of measuring applications
- Scoop function eliminates the need for pipettes and beakers in taking samples
- A sensor guard protects the delicate electrode

### Specifications

|                     |                          |
|---------------------|--------------------------|
| Measurement range:  | pH 0 – pH 14             |
| Sample temperature: | 5-40°C                   |
| Accuracy:           | +/-0.1 pH                |
| Calibration:        | Two-point (pH 4, pH 7)   |
| Power:              | 2 x CR2032 batteries     |
| Battery life:       | 400 hours continuous use |
| Weight, g:          | 53                       |
| Dimensions, mm:     | 164 x 29 x 20            |

### Catalogue No

### Description

|                 |                  |
|-----------------|------------------|
| <b>AG22-600</b> | Compact pH Meter |
|-----------------|------------------|





AG22-650



### Compact Conductivity Meter

Incorporating a flat sensor, this conductivity meter can measure the conductivity of a solution from a single drop of sample. Users can either place a sample on the meters flat sensor or immerse the meter directly in the solution being tested, giving the meter a broad range of applications e.g. measuring rainwater pollution levels or the electric conductivity (EC) of solutions used in agricultural operations. The device also includes a convenient salinity conversion indicator. Supplied complete with standard solution set. Replacement sets and conductivity probes are also available on request.

- Highly precise measurements can be obtained from a single-drop sample
- Automatic range switching gives a wide measurement range
- Automatic calibration, automatic temperature conversion, and other intelligent functions are standard features

| Specifications         |                                       |                                   |                                   |
|------------------------|---------------------------------------|-----------------------------------|-----------------------------------|
| Measurement method:    | 2 Electrode Bipolar AC                | Potassium ion electrode           | Nitrate ion electrode             |
| Minimum sample volume: | 0.12ml                                | Custom digital LCD with backlight | Custom digital LCD with backlight |
| Accuracy:              | 2% (0-19.99mS/cm), 5% (20-199.9mS/cm) | 400 hours continuous use          | 400 hours continuous use          |
| Power:                 | 2 x CR2032 batteries                  | 4-9900                            | 6-9900                            |
| Battery life:          | 400 hours continuous use              | +/-10%                            | +/-10%                            |
| Operating Temperature: | 5 to 40°C                             | 0.3ml                             | 0.3ml                             |
| Weight, g:             | 50                                    |                                   |                                   |
| Dimensions, mm:        | 164 x 29 x 20                         |                                   |                                   |
| Catalogue No           | Description                           |                                   |                                   |
| AG22-650               | Compact Conductivity Meter            |                                   |                                   |

AG22-655



### Direct Soil pH Measurement Kit

The kit has been designed to measure pH directly in soil accurately and quickly. Testing both the pH of soil directly or after preparation of a diluted sample. In order to measure the pH directly, the kit includes a plastic auger to perforate the ground. The pH electrode has been specifically designed for direct soil measurement. It has a conical, rugged tip and can be directly inserted in moist or soft soil. Use the specially made soil preparation solution for higher degrees of accuracy, or for stony ground where the electrode may be damaged. This solution is included to help you measure pH more precisely by diluting the soil sample. This hand held product has a large, multi-level LCD which displays the primary reading, temperature and calibration guides simultaneously. Complete kit includes meter, pH electrode, soil auger, soil preparation solution, starter set of calibration solution sachets, 100ml plastic beaker, batteries, instructions and carrying case.

| Specifications            |             |   |
|---------------------------|-------------|---|
| Range:                    | pH          | -2.00 to 16.00 pH   |
|                           | Temperature | -5.0 to 105.0 °c  |
| Resolution:               | pH          | 0.01 pH   |
|                           | Temperature | 0.1 °c  |
| Accuracy: (@20 °c)        | pH          | ±0.02 pH  |
|                           | Temperature | ±0.5 °c up to 60 °c; ±1 °c outside  |
| Temperature Compensation: |             | Automatic   |
| pH Calibration:           |             | Automatic 1 Or 2 point calibration with 2 sets of memorized buffers (4.01, 7.01, 10.01 or 4.01, 6.86, 9.18) |
| Electrode: (included)     |             | pre amplified pH/ temperature electrode with DIN connector and 1m cable                                     |
| Battery:                  |             | Type (3) 1.2V AAA, life: 1500 hrs   |
| Environment:              |             | 0 to 50 °c RH max. 100%   |
| Dimensions, mm:           |             | 150 x 58 x 29   |
| Weight, g:                |             | 205   |



AG22-700

| Catalogue No | Description  |
|--------------|--|
| AG22-655     | Direct Soil pH Measurement Kit   |
| AG22-656     | pH electrode for soil measurement, with internal temperature sensor, DIN connector on a 1m cable |
| AG22-657     | Refill pack containing buffers and cleaning solutions  |

## Wet Sieving Apparatus

This wet sieving apparatus is used to determine the aggregate stability of soil. Due to the impact of aggregate stability on plant growth and soil loss, applications of the wet sieving apparatus are the fields of agriculture and land conservation. This method to determine aggregate stability will be especially useful for researchers and scientists on soil erosion, land degradation and conservation, agriculture, sustainable agriculture.

| Catalogue No | Description           |
|--------------|-----------------------|
| AG22-700     | Wet Sieving Apparatus |



AG22-800

## Pipette Apparatus – table model

The particle-size distribution is one of the most important physical qualities of a soil. A simple method for the determination of the particle size is the pipette method.

After carbonates, organic substances and possible iron oxide have been removed, the pipette method is used to determine the fractions of particles smaller than 38 µm.

- Determination of fines acc. to ISO 11277
- 7 samples can be determined simultaneously
- Thermostatically controlled bath temperature
- Modernized to suit all professional users

| Catalogue No | Description                     |
|--------------|---------------------------------|
| AG22-800     | Pipette Apparatus – table model |



HM4000

## HM4000 Metalyser Heavy Metals Soils Analyser

Portable Analyser, incorporating innovative extraction and digestion equipment, for easy detection of heavy metals in soil samples.

- Rapid in-field analysis
- Precise results to ppb levels
- Voltammetric technique
- User-friendly extraction and analysis
- Rugged, waterproof carrying case
- Consumables for 50 tests included

| Catalogue No | Description  |
|--------------|--|
| HM4000       | Complete Kit contains:- Metalyser HM4000 Instrument, Sonde with 2m cable, 3 working electrodes, 1 reference electrode, 1 counter electrode, beakers, mains charger, car charger, USB cable, buffers, standards and conditioning solutions for analysis of 7 metals (AsII, As(total), Cd, Au, Cu, Hg, Pb) soil extraction kit, Metaware software and waterproof carry case. |



|         |             |         |      |        |         |      |
|---------|-------------|---------|------|--------|---------|------|
| ASIII   | AS<br>TOTAL | CD      | AU   | CU     | HG      | PB   |
| Arsenic | Arsenic     | Cadmium | Gold | Copper | Mercury | Lead |



# Also available within the Metalyser range



## HM1000 Metalyser Portable

Portable Analyser for the quick and easy detection of heavy metals in water, at ppb levels.

- Rapid in-field analysis
- Precise results from as low as 3 ppb
- Voltammetric technique
- Intuitive user interface
- Rugged, waterproof design
- Consumables for 50 tests included

|                 |               |                |              |               |
|-----------------|---------------|----------------|--------------|---------------|
| As<br>Arsenic   | Cd<br>Cadmium | Cr<br>Chromium | Cu<br>Copper | Hg<br>Mercury |
| Mn<br>Magnesium | Ni<br>Nickel  | Pb<br>Lead     | Zn<br>Zinc   |               |

## HM2000 Metalyser Deluxe

Portable Field Kit, combining electrochemical & photometric techniques, for analysing a more diverse range of metals in water.

- Rapid in-field analysis
- Suitable for remediation studies
- Voltammetric and photometric techniques
- Precise results from ppb to ppm levels
- Intuitive user interface
- Rugged, waterproof kit
- Consumables for 50 test included

|                 |               |               |                 |                |
|-----------------|---------------|---------------|-----------------|----------------|
| Al<br>Aluminium | As<br>Arsenic | B<br>Boron    | Cd<br>Cadmium   | Cr<br>Chromium |
| Cu<br>Copper    | Fe<br>Iron    | Hg<br>Mercury | Mn<br>Magnesium | Ni<br>Nickel   |
| Pb<br>Lead      | Zn<br>Zinc    |               |                 |                |

## HM3000 Metalyser Field Pro

Advanced Portable Analyser, with integrated tablet PC and bespoke software, for precise analysis of a wide range of heavy metals in water.

- Rapid laboratory analysis in field, using integrated tablet PC
- Precise results from as low as 1 ppb
- Voltammetric technique
- Intuitive graphical software interface
- Built-in wireless connectivity
- Rugged, waterproof kit
- Consumables for 50 tests included

|                 |              |               |               |                 |
|-----------------|--------------|---------------|---------------|-----------------|
| Al<br>Aluminium | Au<br>Gold   | Bi<br>Bismuth | Cd<br>Cadmium | Co<br>Cobalt    |
| Cr<br>Chromium  | Cu<br>Copper | Fe<br>Iron    | Hg<br>Mercury | Mn<br>Magnesium |
| Ni<br>Nickel    | Pb<br>Lead   | Sn<br>Tin     | Zn<br>Zinc    |                 |

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# Irrigation Water Quality Testing

Good quality water for use in agricultural development is essential to ensure healthy plant growth and the field test kits shown in this section are intended to measure the key water quality parameters quickly and simply.

## Irrigation Water Test Kit

AG24-600

A comprehensive testing kit designated to measuring the following parameters of water quality: pH, Turdal hardness, Chloride, Nitrates, Nitrites and Ammonia

The complete range of equipment is contained in a portable moulded plastic case that is ideal for field work.

- Checks for safe range of pH pf water for plants. 6.5 to 8.4
- Total hardness - test for measuring total calcium and magnesium levels in water
- Desirable range for plant growth is from 100 to 150 mg/l
- Chloride test for salinity of water.



| Chloride (mg/l) | Effect on Crops                            |
|-----------------|--|
| Below 70        | Generally safe for all plants              |
| 70-140          | Sensitive plants show adverse affects      |
| 141-350         | Moderately tolerant plants adverse affects |
| Above 350       | Can cause severe problems                  |

| Catalogue No | Description   |
|--------------|---|
| AG24-600     | Irrigation Water Test Kit                                       |
| AG24-602     | Refill Pack for Irrigation Test Kit-- Calcium Hardness-50 tests |
| AG24-604     | Refill Pack for Irrigation Test Kit-- Chloride-50 tests         |
| AG24-606     | Refill Pack for Irrigation Test Kit-- Ammonia-250 tests         |
| AG24-608     | Refill Pack for Irrigation Test Kit--Nitrate-250 tests          |
| AG24-610     | Refill Pack for Irrigation Test Kit--Nitrite-250 tests          |





AG24-100



## Sewage Effluent Test Kit

Sewage Effluents are used in many countries for irrigation, and this kit provides a simple means of checking the quality of such water.

It is used extensively for control testing at small sewage works. Based on simplified methods of sewage effluent testing, the kit contains tests for the essential quality control checks required for the day-to-day operation of sewage effluent treatment plants. Each of the tests is performed simply without the use of complicated equipment and are suitable without formal training in water testing and analysis.

- Permanganate Value - enables the Permanganate Value (PV) to be determined and the effluent classified as to its acceptability for discharge.
- pH test - Chemical and biological reactions at sewage works are profoundly influenced by pH. A pH test will also check, for example, on the effect of acid or alkaline trade wastes in the effluent flow.
- Turbidity and Suspended Solids - Designed to give a measure of the suspended solids content of the final effluent. It is also useful in following the day-to-day variation in the quality of sewage and effluent.
- Probable BOD, COD and TOC - It is possible to derive an indication of the Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD) and Total Organic Carbon (TOC) from the result of the Permanganate Value test.
- Temperature - A check should be maintained on the temperature of effluent discharges and these should always be close to ambient temperatures.
- Kit comes complete with a -10° to +50° thermometer complete in a brass protecting case.

| Catalogue No    | Description   |
|-----------------|---|
| <b>AG24-100</b> | Sewage Effluent Test kit                                |
| <b>AG24-102</b> | Spare reagents for permanganate value and pH (50 tests) |

AG24-110



## Aquaculture Water Test Kit

This kit provides users with the most important test parameters for aquaculture applications: alkalinity, carbon dioxide, dissolved oxygen, hardness, pH and salinity.

Each of these parameters plays a critical role in the delicate balance of the aquatic environment: alkalinity acts as a stabilizer for pH; carbon dioxide must be monitored because of its toxic effects on fish (every species can tolerate different levels of CO<sub>2</sub>); oxygen levels affect fish respiration and incorrect concentrations can slow down their growth rate; hardness is monitored because it diminishes the toxicity level of ammonia; pH also is measured to determine the toxicity level of the water; salinity is important because of its relation to dissolved oxygen.

| Parameter         | Range                                    | Method               | Smallest Increment             | Chemical Method                     | Number Of Test |
|-------------------|--|----------------------|--------------------------------|-------------------------------------|----------------|
| Alkalinity        | 0-100 mg/L<br>0-300 mg/L                 | Titration            | 1 mg/L<br>3 mg/L               | Phenolphthalein/<br>Bromphenol blue | approx. 110    |
| Carbon Dioxide    | 0-10.0 mg/L<br>0-50.0 mg/L<br>0-100 mg/L | Titration            | 0.1 mg/L<br>0.5 mg/L<br>1 mg/L | Phenolphthalein                     | approx. 110    |
| Hardness          | 0-30.0 mg/L<br>0-300 mg/L                | Titration            | 0.3 mg/L<br>3 mg/L             | EDTA                                | approx. 110    |
| Oxygen, Dissolved | 0-10.0 mg/L                              | Titration            | 0.1 mg/L                       | Modified Winkler                    | approx. 110    |
| pH                | 0-14.0 pH                                | Electronic pH Tester | 0.1 pH                         | N/A                                 | approx. 110    |
| Salinity          | 0-40 g/kg                                | Titration            | 0.4 g/kg                       | Mercuric Nitrate                    | approx. 110    |

| Catalogue No    | Description   |
|-----------------|---|
| <b>AG24-110</b> | Aquaculture Test Kit, includes all reagents necessary to perform over 100 tests for each parameter, electronic pH tester, rigid carrying case, all needed accessories for tests and instruction manuals.vvv |



# Soil Moisture and Permeability

Water management in agriculture is essential to ensure scarce irrigation water resources are used carefully and efficiently.

The instruments in this section are used to collect important data on soil moisture content, soil moisture retention, infiltration capacity, permeability, hydraulic conductivity, and soil compaction that will assist the agronomist, soil scientist and farmer in making important decisions on irrigation scheduling etc.

## Quickdraw Soil Moisture Probe

AG25-100

With reaction times varying from 3-5 minutes in sandy loam to 12-15 minutes in heavy clay, this instrument is suitable for both greenhouse and field measurement. This is a durable Tensiometer on which the probe readings are unaffected by differing soil types, soil temperatures or salinity conditions.

Available in two lengths: 300mm and 450mm. The length is measured from the mid-portion of the ceramic tip upward to a point approximately 50mm below the gauge.

- Large 50mm dial gauge reads directly in centibars of soil suction, the basic measurement used by soil scientists
- Hydraulic force of soil water is measured through the porous ceramic tip
- Probe indicates moisture conditions in relationship to plant growth, thus demonstrating the basic forces involved in moisture movement



| Catalogue No | Description                          |
|--------------|--------------------------------------|
| AG25-100     | Quickdraw Soil Moisture Probe, 300mm |
| AG25-102     | Quickdraw Soil Moisture Probe, 450mm |



### Zero

A gauge reading of zero means the surrounding soil is completely saturated with water, regardless of the type of soil.



### 20-40 Centibars

Available moisture and aeration good for plant growth. Heavy Clay Soils: No irrigation required. Medium Textured Soils: No irrigation required. Sandy Soils: Irrigation started for coarser sandy soils in the 20-30 cb range. For finer sandy soils in the 30-40 cb range.



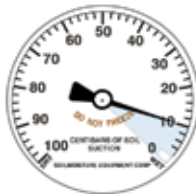
### 0-10 Centibars

This range indicates a surplus of water for plant growth. Water held by the soil in this range drains off within a few days.



### 40-60 Centibars

Available moisture and aeration are good for plant growth in finer textured soils. Heavy Clay Soils: No irrigation required. Medium Textured Soils: Irrigation started in this range. The finer the texture the higher the reading before start of irrigation. Sandy Soils: Too dry. Hot windy conditions can force soil suction to high reading quickly and damage plants.



### 10-20 Centibars

This indicates that there is ample moisture and also air in the soil for healthy plant growth in all types of soils. This range is often referred to as the "field capacity" range for soils.



### 60-80 Centibars

Readily available moisture scarce, except in heavy clay soils. Heavy Clay Soils: Start of irrigation desirable as soil suction values reach 70-80 cb. Medium Textured Soils: Too dry. Hot, windy conditions can force soil suction to high reading quickly and damage plants. Sandy Soils: Too dry. Damage to plants will occur before irrigation can be applied.



AG25-150



## Dial Gauge Tensiometers

Tensiometers measure the water availability to plant roots and so can be used in irrigation and crop management. They are designed to be permanently installed in the growing medium, which they equilibrate with and measure the 'soil suction' used by the roots to remove water from the soil.

This is a simple, effective and low cost Tensiometer that is particularly suitable for applications such as irrigation scheduling and crop management.

- Suitable for soil, peat and many other mediums
- Robust construction for long life
- Full instructions included

| Specifications        |   |
|-----------------------|---|
| Operating range, °C:  | 0 to 70 (precautions required for operation in below zero conditions) |
| Shaft construction:   | Porous Ceramic bulb. Clear acrylic shaft. Rubber septum stopper       |
| Gauge dimensions, mm: | 41 x 26   |
| Gauge construction:   | Brass mechanism. Plastic housing                                      |

| Catalogue No | Description   |
|--------------|---|
| AG25-150     | Dial Gauge Tensiometer, 300mm long. Requires service kit. |
| AG25-152     | Dial Gauge Tensiometer, 600mm long. Requires service kit. |
| AG25-154     | Dial Gauge Tensiometer, 900mm long. Requires service kit. |

## Accessories

| Catalogue No | Description   |
|--------------|---|
| AG25-156     | Auger kit for Tensiometers - Contains 19mm dia, 600mm long Auger and spatula. |
| AG25-158     | Service kit for Tensiometers - Contains syringe and filling tube.             |



## Soil Moisture Meter

AG25-200

Solid state, electrical resistance type sensor provides accurate readings from 0 to 200 centibars, covering the entire soil moisture range required in irrigated agriculture. In operation, soil moisture is constantly being absorbed or released from the sensor. As soil dries out, sensor moisture is reduced and electrical resistance between electrodes is increased. Resistance is read by the hand-held digital meter which gives a digital readout in centibars of soil water suction. Digital meter features soil temperature compensation which adjusts for the effect soil temperature has on electrical resistance reading. Temperature scale can be adjusted to use either °F or °C scales. To use, bury the sensor to desired depth, connect alligator clips located on meter to the sensor, and view results on digital display. Sensor is manufactured from non-corrosive parts and measures 22mm dia. x 82mm. Accuracy: ±3%.



AG25-202

| Catalogue No | Description  |
|--------------|--|
| AG25-200     | Digital soil moisture meter and sensor with 1.5m cable |
| AG25-202     | Replacement sensor                                     |

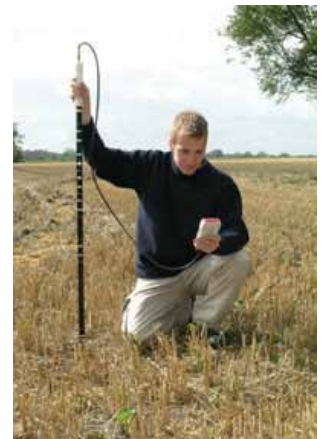


## Soil Profile Probe

AG25-250

No other system enables you to monitor your soil water profiles with such ease and flexibility. Install an access tube into the soil, insert the probe and press the 'Read' button to display an instantaneous reading, or connect the unit to a data logger and leave the system to record soil moisture changes over time. The access tube requires an installation hole of 27mm in diameter, allowing easy installation and minimal soil disturbance. Correct installation is essential and we recommend the use of the specially designed augering equipment as displayed below.

- Soil moisture content - not just trends
- Low salinity and temperature sensitivity
- Portable meter option for multisite measurement
- Datalogger option for continuous monitoring
- Out of the box solution - supplied with soil calibrations for common soil types
- Uses access tubes for easy probe insertion and removal



| Catalogue No | Description        |
|--------------|--------------------|
| AG25-250     | Soil Profile Probe |

### Accessories

| Catalogue No | Description  |
|--------------|--|
| AG25-252     | Data Logger:<br>With IP67 weather-proof case and battery power.<br>Up to 16000 readings can be stored in the memory.                     |
| AG25-254     | Moisture Meter:<br>Holds multiple user-defined soil types. Stores up to 2000 time-stamped readings. Includes PC data collection software |
| AG25-256     | Augering Kit:<br>Essential equipment for the correct installation of the access tubes on the soil profile probe                          |
| AG25-257     | Access tubing, 28mm dia x 115cm long   |





AG25-300



## In-Situ Soil Moisture, Temperature and Salinity Probe

A soil monitoring sensor that provides continual, consistent accuracy measuring the three most significant soil parameters simultaneously—moisture, salinity and temperature.

- Engineered to be exceptionally rugged and will provide data that you can trust year after year.
- Can remain in-situ indefinitely, or relocated and redeployed without worry.
- Ideal for remote locations, harsh environments and applications where data is critical
- Enables measurement of native (undisturbed) soil, even hard-packed clay.
- Repeatable accuracy and stability without the need for calibration in most soils and zero maintenance required.
- Unparalleled spatial and temporal measurement consistency

| Catalogue Number | Cable Length (m) |
|------------------|------------------|
| AG25-300         | 7.5              |
| AG25-310         | 15               |
| AG25-320         | 30               |

| Technical Specifications   | Description                |
|----------------------------|----------------------------|
| Operating temperature (°C) | -10°C to 65°C              |
| Water resistance           | Continuous full submersion |
| Power                      | 9-20 VDC                   |
| Length                     | 124mm                      |
| Diameter                   | 42mm                       |
| Weight                     | 200g                       |
| Cable length               | 8m                         |

|             | Accuracy                 | Range             | Resolution |
|-------------|--------------------------|-------------------|------------|
| Moisture    | 0.01WFV                  | 0-100% saturation | 0.001      |
| Temperature | 0.3°C                    | -10°C to +60°C    | 0.1        |
| Salinity    | Largest of 2% & 0.02 S/m | 0 to 1.5 S/m      | 0.001      |

Longer cable lengths can be catered for upon request

AG25-280



### Accessories

This Data Hub is for use with the soil moisture probes and has multiple, simultaneous inputs and outputs to connect to a wider range of environmental sensors which can trigger alarms; switches; other sensors and gauges. It can work in remote locations as a data-logger or as a telemetry system for distributing or sharing data through on-board RF, GPRS or Satellite portals. The Data Hub can be enabled to automatically forward data to a customer's FTP Server. Data can be transferred in .csv; .dat; .XML or .JSON formats.

| Catalogue Number | Description |
|------------------|-------------|
| AG25-280         | Data Hub    |



## Portable Soil Moisture, Temperature and Salinity Probe

AG25-340

Take soil measurements anywhere for those applications not requiring a permanent soil monitoring system. Your Apple or Android device communicates wirelessly with the probe using Bluetooth. It features a rugged, engineered resin housing that contains a rechargeable battery good for a full day's heavy use. It comes with a detachable ergonomic pole so it can be inserted without bending over.

| Catalogue No | Description  |
|--------------|--|
| AG25-340     | Portable Soil Moisture, Temperature and Salinity Probe |

| Technical Specifications | Description                       |
|--------------------------|-----------------------------------|
| Power                    | Rechargeable NiMH battery 300 mAh |
| Housing                  | Anodised aluminium                |
| Operating temperature    | -10°C to 65°C                     |
| Soil tine assembly       | Marine grade stainless steel      |
| Total length, mm         | 700 to 1530                       |
| Sensor body length, mm   | 200 inc. tines                    |
| Sensor body diameter, mm | 75                                |

|             | Accuracy                 | Range         |
|-------------|--------------------------|---------------|
| Moisture    | 0.01WFV                  | 0-100%        |
| Temperature | 0.3°C                    | -10°C to 60°C |
| Salinity    | Largest of 2% & 0.02 S/m | 0 to 1.5 S/m  |



AG25-210

## Set for pF-determination

A set used to determine pF over the complete range from pF 0 to pF 4.2, where values close to zero show soil saturated in water and values close to four showing dry soil. An extensive set has been composed in order to carry out this work which consists of:

- A sandbox for pF-determination 0 - 2.0 for a max. of 40 soil sample rings.
- A sand-/kaolin box for pF-determination 2.0 - 2.7 for a max. of 40 soil sample rings.
- A membrane apparatus for pF-determination 3.0 - 4.2 for a max. of 15 soil sample rings, including compressor and accessories.
- A soil sample ring kit (with conical screw thread connection) for taking undisturbed samples to a depth of up to 2 meter.
- Cases with soil sample rings.
- Aluminium soil sample boxes for drying the soil samples in a drying oven.

| Catalogue No | Description              |
|--------------|--------------------------|
| AG25-210     | Set for pF-determination |





AG25-350



### Soil Drying Oven

A laboratory oven designed to dry and aggregate large quantities of soils in accordance with most B.S and ASTM requirements. Constructed of a prefinished coated mild steel exterior and an aluminium coated steel interior chamber which is both durable and corrosion resistant. This unit meets the requirements of BS 1377 and is ideal for on-site laboratories and general soils and aggregate testing.

- Dial thermometer 0-200°C with collar fixing for door
- LED display for showing temperature on thermostatically controlled units
- Heavy duty shelves
- Units complying to BS2648
- Traceable calibration certificates

| Catalogue No | Description                            |
|--------------|--|
| AG25-350     | Capacity, l: 220                       |
|              | Temperature, °C: 50-250                |
|              | Fluctuation, °C: 0.6                   |
|              | Number of shelves: 3                   |
|              | Shelf positions: 4                     |
|              | Power: 220/240V AC 50 Hz               |
|              | Weight, kg: 96                         |
|              | Internal dimensions, cm: 54 x 92 x 44  |
|              | External dimensions, cm: 94 x 109 x 57 |

AG25-400



### Handheld Infiltrometer

A handheld Infiltrometer that provides quick and convenient measurements of soil hydraulic conductivity. The Infiltrometer is constructed of a polycarbonate tube with a semi-permeable stainless steel sintered disk. An adjustable steel tube is installed above the sample chamber to regulate the suction rate. The Infiltrometer is immersed in water and the rubber stopper is installed while it is still underwater. When taken out of the water, it will not infiltrate until the water tension on the disk is broken. The disk is placed on the soil surface, and the volume change is recorded at regular intervals.

This Infiltrometer is ideal for soil hydrology studies, classroom instruction, research, and many other applications. The suction rate can be adjusted to accommodate measurement of any soil type.

| Catalogue No | Description  |
|--------------|--|
| AG25-400     | Total dimensions: Height: 32.7 cm (12.9 in), Diameter: 3.1 cm (1.2 in)   |
|              | Stainless steel disk: Height: 3.0 mm (1.2 in), Diameter: 4.5 cm (1.8 in) |
|              | Mariotte chamber: Volume: 40.0 mL  |
|              | Reservoir chamber: Volume: 95.0 mL                                       |
|              | Suction range: Minimum: 0.5 cm (0.2 in), Maximum: 7.0 cm (2.8 in)        |

**NOTE:**

Wagtech Projects offer a comprehensive range of ovens, please refer to our General Lab Catalogue.

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## Double Ring Infiltrometer

The double ring Infiltrometer is a simple instrument that is used to determine the rate of infiltration of water into the soil. The measure of infiltration of water into the soil is an important indication concerning the efficiency of irrigation and drainage, optimising the availability of water for plants, improving the yield of crops and minimising erosion.

The provision of 3 measuring devices permits the synchronous determination of infiltration capacity in triplicate, with the benefit of more representative and reliable data.

The unit may be used for determining the rate of infiltration and capacity for irrigation and drainage projects, studying drainage, determining the intensity of artificial precipitation and the effect of treatment of the soil.

- Ideal for infiltration measurement of top soils
- Perfect for flood / furrow irrigation advice
- Triple rings to get a representative average
- Stainless steel rings



| Catalogue No | Description  |
|--------------|--|
| AG25-450     | Double ring Infiltrometer, complete kit comprising 3 Infiltrometers; inner ring 280mm, outer ring 530mm diameter; inner ring 300mm, outer ring 550mm diameter; inner ring 320mm, outer ring 570mm diameter; driving plate with handle for inner and outer rings. 3 adjustable measuring bridges, 3 floats with measuring rods, and a nylon headed hammer |
| AG25-452     | Double ring Infiltrometer, comprising one inner ring 280mm diameter and one outer ring 530mm diameter, an adjustable measuring bridge and float  |
| AG25-454     | Driving plate with handle for placing rings  |





AG25-800



## Soil Compaction Meter

Measure, log, and review data with this Soil Compaction Meter to make better soil management decisions based on data specific to your field. Identify and address specific problem areas on-site and in real time.

Soil Compaction meters are used to determine the density of soil and other material. An operator pushes a rod with attached (ASAE standard) cone into the ground. The resistance of the cone as it is pushed in the ground is measured and recorded in the memory of the compaction meter. The depth of the cone below soil surface is also measured and recorded in memory. Compaction data is recorded and displayed at one inch intervals, in PSI or kPa. Built-in datalogger eliminates the need to record data manually. Included software allows user to download data, change logger settings and configure the meter.

| Catalogue No    | Description   |
|-----------------|---|
| <b>AG25-800</b> | Measurement units: Cone Index (PSI or kPa)                          |
|                 | Resolution: 25mm, 5 PSI 935 kPa)                                    |
|                 | Accuracy: ± 125mm depth, ± 15 PSI (103 kPa) Pressure                |
|                 | Diameter of tube, mm: 31  |
|                 | Range: 0-440mm, 0-1,000 PSI (0-7,000 kPa)                           |
|                 | Battery life: 4 AAA alkaline batteries; approximately 12-month life |
|                 | Data logger capacity: 772 profiles                                  |

AG25-500



## Proctor Penetrometer

A spring-type Penetrometer that can be used in the field for the controlling of soil compaction. The stem is calibrated to 150 lbf x 2 lbf divisions, and a sliding collar indicates the applied load. A rapid estimate of the moisture content of soil can be obtained by comparing the amount of penetration of the needle for a corresponding load, with a laboratory determined moisture/density curve for a similar soil.

The set comes complete with accessories and 9 interchangeable stainless steel needles with diameters of 4.52, 5.23, 6.40, 9.07, 12.83, 16.54, 20.22, 24.79, and 28.55mm.

| Catalogue No    | Description          |
|-----------------|----------------------|
| <b>AG25-500</b> | Proctor Penetrometer |

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## Proving Ring Penetrometer

AG25-600

A 30° cone Penetrometer that is used to determine the bearing strength, penetration resistance of soil, and the compaction degree of subgrades. To determine the penetration resistance, the Penetrometer is firmly pushed into the soil at a uniform rate. When the top of the penetration cone is reached, the proving ring dial is read. The corresponding penetration loads can be determined from the calibration chart supplied. The proving ring dial indicator is equipped with a maximum load pointer. Penetrometer is lightweight and compact and is supplied with a handle and rod extension. The single proving ring has a capacity of 1 kN. The extension rod is graduated every 100mm. The cone points are easily removed.



| Catalogue No | Description               |
|--------------|---------------------------|
| AG25-600     | Proving Ring Penetrometer |

## Field Vane Tester

Used to determine the shear strength of cohesive very soft, to firm non-fissured soil on site. The maximum torque value is measured on a collar attached to the shaft. The Vane Tester consists of three exchangeable vanes, extended by 500mm rods. It covers three ranges of measurement, 0-50, 0-100, 0-200kPa, depending on the size of the vane used: 16 x 32mm, 20 x 40mm or 25.4 x 50.8mm. The kit, which is housed in a tough and durable carry case, comprises the following equipment:

AG25-650

- 500mm Extension Rod x 6
- 16 x 32mm Vane (0-200kPa)
- 20 x 40mm Vane (0-100kPa)
- 25.4 x 50.8mm Vane (0-50kPa)
- Dummy Vane
- 8mm Wrench
- 17mm Wrench
- Connection Piece for extension rods and vanes x 10
- Measuring Head



| Catalogue No | Description       |
|--------------|-------------------|
| AG25-650     | Field Vane Tester |

AG25-700

## Hand Vane Tester

An accurate and portable instrument for the determination of in-situ shear strength of cohesive soils, either on site or on undisturbed samples within the laboratory. The instrument comprises a torque head with a direct reading scale which is turned by hand. A non-return pointer indicates the reading. The vanes, either 19mm or 33mm diameter, are screwed into the rear of the torque head, and pushed at least 200mm into undisturbed clay. Extra 300mm or 1000mm extension rods can be used for greater penetration and for gaining access to difficult or dangerous locations.



| Catalogue No | Description   |
|--------------|---|
| AG25-700     | Hand vane tester, complete with 2 vanes; 19mm for 0-120 kPa shear strength, and 33mm vane for 0-28 kPa shear strength, 2 spanners, and a carry case |
| AG25-702     | 300mm long extension rods   |
| AG25-704     | 1000mm long extension rods  |



# Agrometeorology

**Agrometeorology:**

Information on weather conditions is essential for the modern farmer and agronomist. Although such information may be readily available from national meteorological offices, details of more localised conditions may not be and such data is of vital importance to farmers to ensure their crops are protected and flourish. Local weather conditions can vary greatly from the national picture due to the aspect, altitude, and microclimate of a particular area.

**Automatic Weather Stations:**

This section includes a range of automatic weather stations that are used for measuring all the standard parameters such as wind speed, wind direction, air temperature, relative humidity, solar radiation, and rainfall. In addition, some more specialised stations have also been included for Agro-Meteorology, Hydrological and Soil Conditions Monitoring.

Our standard systems use the most widely-used sensors. However, additional sensors are available for use with our weather stations, such as net radiation, UV radiation, dew point and tensiometers, as well as full integration with our Maji systems for water quality logging. Please contact Wagtech Projects if you require a bespoke weather station, and we will create a customised solution for you.

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AG31-100



## TraceMet® Automatic Weather Stations

TraceMet® is a range of Automatic Weather Stations (AWS) that have been carefully designed for the collection of accurate and reliable data on atmospheric, soil, plant and surface water conditions. With a choice of 6 varieties, there is a weather station for every situation.

Each system has been created to be fully self-sufficient in order to minimise the amount of physical interaction needed after installation and commissioning. This has been achieved by the integration of our unique TraceLogger® for data collection and transmission, an 18Ah battery with protective heat shield and a 30W solar charging system.

Detailed below is a selection of stations from the TraceMet range most applicable to Agrometeorology. To see the full range, please see contact our sales team.

## TraceMet® Benefits

Included in all systems

### Aerodynamic Rain Gauges

The unique design of the TraceMet® Tipping Bucket precipitation sensors increase measurement accuracy by capturing more rainfall than traditionally shaped cylindrical gauges. The precision-engineered UV-resistant gauges minimise out-splash and reduce rainfall losses caused by evaporation. The depth, diameter, and angle of the funnels have all been extensively tested and researched to give optimum accuracy in the field.

| Catalogue No | Description |
|--------------|-------------|
| AG32-100     | AgroAWS     |
| AG32-200     | AgroAWS Pro |



## TraceLogger®

The TraceLogger® is a complete high-capacity data logger with 10 universal logging channels which can also be configured as triggers or alarms. It features rapid data transmission over local GPRS, 2G or 3G networks and can be configured to output data to either an FTP or HTTP server. In the event of a network failure, your data would not be lost, thanks to the Tracelogger's on-board storage capabilities. An integrated LCD screen is optional and allows site engineers to ensure system functionality on-site.

## Solar Power System

A high capacity 18Ah lead-acid battery powers the TraceMet® systems, including the data logger and associated sensors. Due to the fact that batteries lose functionality at temperatures exceeding 26°C, the TraceMet® systems incorporate a dedicated heat shield. This reduces the damaging effect of excessive heat on the battery and preserves its lifespan. A 30W solar panel is included to provide power, however even in prolonged periods without sunlight the AWS can still function as normal thanks to the high-capacity battery and efficient TraceLogger®.

## AgroAWS

An economy AWS, ideal for farmers, agronomists and researchers to monitor the key factors that affect plant and crop health. Comprises 7 sensors for measuring 10 parameters:

- Air Temperature
- Barometric Pressure
- Rainfall
- Relative Humidity
- Solar Radiation
- Wind Direction
- Wind Speed
- Leaf Wetness
- Soil Moisture
- Soil Temperature

### Parameter Ranges & Accuracies:

| Parameter           | Range               | Accuracy                                  |
|---------------------|---------------------|---|
| Air Temperature     | -40°C to +60°C      | ±0.6°C (at 23 ±5°C)                       |
| Barometric Pressure | 15 to 115 kPa       | ±1.5%                                     |
| Rainfall Intensity  | 0 to 2000 mm/hr     | 99% up to 120 mm/hr                       |
| Relative Humidity   | 0 to 100%           | ±5.0% RH                                  |
| Solar Radiation     | 360 to 1120 nm      | ±5%                                       |
| Wind Direction      | 360°                | ±0.5%                                     |
| Wind Speed          | 0 to 90m/s          | 2%  |
| Leaf Wetness        |                     |   |
| Soil Moisture       | 0 to 1 m3/m3 (100%) | ±0.03m3/m3                                |
| Soil Temperature    | -20°C to 60°C       | ±0.5°C (0 to 40°C), ±0.75°C (-20 to 60°C) |

## AgroAWS Pro

An advanced, WMO compliant AWS, ideal for governments and researchers to gather high-quality data on the soil-water continuum and regional variations in agricultural potential. Comprising 7 high-spec sensors for measuring 10 parameters:

- Air Temperature
- Barometric Pressure
- Rainfall
- Relative Humidity
- Solar Radiation
- Wind Direction
- Wind Speed
- Leaf Wetness
- Soil Moisture
- Soil Temperature



\*Please note: the images above are for illustration purposes only



AG31-300



\*Please note: the images above are for illustration purposes only

| Parameter           | Range               | Accuracy                                  |
|---------------------|---------------------|---|
| Air Temperature     | -50°C to +100°C     | ±0.2°C (at 23 ±5°C)                       |
| Barometric Pressure | 15 to 115 kPa       | ±1.5%                                     |
| Rainfall Intensity* | 0 to 1000 mm/hr     | 99% up to 120 mm/hr                       |
| Relative Humidity   | 0 to 100%           | ±1.0% RH                                  |
| Solar Radiation     | 360 to 1120 nm      | ±5%                                       |
| Wind Direction      | 360°                | ±0.5%                                     |
| Wind Speed          | 0 to 90m/s          | ±2%                                       |
| Leaf Wetness        |                     |   |
| Soil Moisture       | 0 to 1 m3/m3 (100%) | ±0.03m3/m3                                |
| Soil Temperature    | -20°C to 60°C       | ±0.5°C (0 to 40°C), ±0.75°C (-20 to 60°C) |

\*Pedestal for rain gauge required (not included)

## Software

The TraceMet AWS Management Software is the complete solution for retrieving, recording and analysing meteorological data collected by your weather stations. The software is packed with useful features from viewing trends through automatically generated graphs to managing your network in map view. Although the hardware is able to collect and push data manually, the addition of software which processes and displays your data automatically enhances your ability to forecast and predict weather patterns. Full features include:

- Data retrieval from locally based server (stand-alone system) or cloud based system
- Auto-updating graphical snapshot display of all main meteorological parameters
- Charts to provide a graphical tool for monitoring the trend of multiple parameters
- Summary window providing an auto-updating daily text summary of conditions with highs and lows
- Monthly and Yearly summaries with calculated statistics
- Ability to push data to a website for public use
- Settings on the AWS console can be controlled from the in-house based workstations
- Logged data may be exported in a variety of text formats for easy compatibility with other programmes
- Alert system with SMS, email, messaging capabilities
- Stations assigned with ID numbers and GPS locations enabling individual system statuses to be determined
- Drill down capabilities with individual stations or clusters

Exact software functionality may be customised according to individual needs; please contact Wagtech Projects for more information.

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## Technical Specifications

### TraceLogger®

|                                      |   |
|--------------------------------------|---|
| Channels                             | 10 channels: 8 multi-function channels (analogue or digital), 2 dedicated rain gauge channels and 1 dedicated battery volts channel |
| Operating range                      | -40°C to +70°C  |
| Display option                       | Outside mounted 16 x 2 LCD backlight display  |
| CPU                                  | 16-Bit PIC24E   |
| ADC                                  | 12-Bit  |
| Clock (RTC)                          | Accuracy ±2ppm from 0°C to +40°C  |
| Accuracy ±3.5ppm from -40°C to +70°C | 360°  |
| Operating Voltage Range              | 9-15V range   |
| Power Consumption                    | >1mA Sleep (Normal) Mode, >150mA Backlight Display Mode, >300mA Data Transmission Mode  |
| Housing                              | Grey ABS with seal to IP65  |
| Dimensions, mm                       | 192 x 156 x 112   |

### Products

| Description  | Part Number |
|--|-------------|
| TraceMet® AgroAWS  | AG32-100    |
| TraceMet® AgroAWS Pro  | AG32-200    |
| <b>System Components</b>                                       |             |
| TraceLogger®   | AG32-300    |
| 2m portable mast mounted on metal plate with guylines and pegs | AG32-400    |
| 10m retractable mast with guylines, base and pegs              | AG32-410    |
| <b>Sensors</b>   |             |
| Air Temperature  | AG32-500    |
| Barometric Pressure  | AG32-502    |
| Rainfall Intensity   | AG32-504    |
| Relative Humidity  | AG32-506    |
| Solar Radiation  | AG32-508    |
| Wind Direction   | AG32-510    |
| Wind Speed   | AG32-512    |
| Leaf Wetness   | AG32-514    |
| Soil Moisture  | AG32-516    |
| Soil Temperature   | AG32-518    |
| <b>Services</b>  |             |
| Software   | AG32-600    |
| Installation, commissioning and training*                      | POA         |

\*includes sourcing of local items such as SIM card and Advanced Rain Gauge pedestal.

A group of people, including a woman in a white blazer, gathered around a table with scientific equipment like a water testing kit and a scale.

# Local Agent Support And Training Sets Us Apart From Our Competitors

Wagtech Projects have a team of qualified engineers and technicians who are available for installation, commissioning and training around the world.



# Hydrology & Groundwater

## Hydrology & Groundwater:

Water is a precious agricultural resource and thus its careful monitoring is essential in order to ensure that it is used as effectively as possible.

In any water resources assessment study, long term measurements of water quality, flow, level, and depth are crucial to produce accurate data for later processing and analysis.

This section contains a comprehensive range of equipment that is widely used for measuring and recording such data.

Contained within this section are items such as Flow Meters, Flumes, Dipmeters, Water Samplers, and Water Level Monitors.

## Current Flow Monitoring:

A comprehensive range of equipment for the measurement or estimation of water flow in both natural and man-made, irrigation and drainage channels.

## Wagtech Flow Master

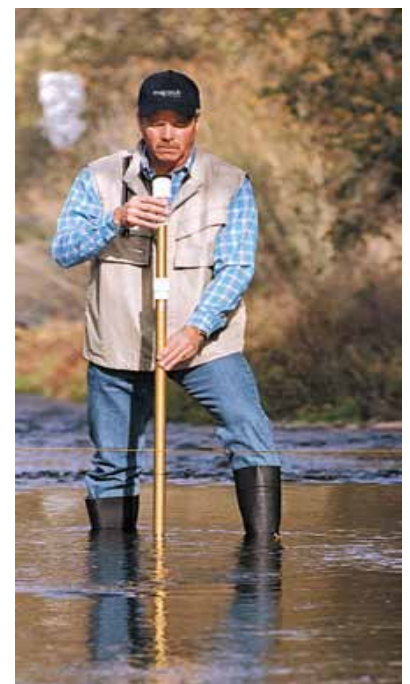
AG41-100

The Wagtech Flow Master is a highly accurate water velocity instrument for measuring flows in open flow channels and partially filled pipes. The instrument has been extensively used by water professionals for over 30 years. The Flow Master consists of the protected Turbo Prop positive displacement sensor coupled with the expandable probe handle to the digital readout display. The water instrument is ideal for storm water run-off studies, sewer flow measurements, measuring flows in rivers and streams, and also in monitoring velocity in ditches and canals.

- Highly accurate and low cost
- Lightweight, rugged, and reliable
- Debris shedding turbo-prop
- Rain-proof digital read-out
- Padded carrying case for easy storage
- Displays instantaneous and true average velocity

| Specification              | AG41-100                                   |
|----------------------------|--|
| Range, m/sec:              | 0.1-6.1                                    |
| Accuracy, m/sec:           | 0.03                                       |
| Operating temperature, °C: | -20 to +70                                 |
| Sensor type:               | Turbo-Prop propeller with magnetic pick-up |
| Datalogger:                | 30 sets, min, max, avg                     |
| Weight, kg:                | 4  |
| Power:                     | Internal batteries - approx 5 year life    |

| Catalogue No | Description                      |
|--------------|----------------------------------|
| AG41-100     | Wagtech Flow Master, 1.1 to 1.8m |
| AG41-102     | Wagtech Flow Master, 1.7 to 4.6m |







AG41-200

## Wagtech Flow Meters



The Wagtech Current Flow Meters are suitable for use in a wide variety of environments ranging from major rivers to small streams, fresh and salt water or effluent.

Measurements can be made for river gauging, open channel flow, pollution and hydrometric studies.

The Wagtech Digital Display Unit (DDU) offers real time and averaged display of velocity with data logging. Data can be downloaded to a PC via the RS232 interface using the cable supplied. The DDU comes with an LCD display with optional backlight sealed to IP65 and weighing less than 1 kg.

- Easy to use, robust, low maintenance design
- Reliable and accurate velocity readings
- Wide measurement range
- Calibrated in accordance with BS3680

| Catalogue No:   | AG41-200                            | AG41-204                    |
|-----------------|-------------------------------------|-----------------------------|
| Velocity range: | 0.03 to 10m/s                       | 0.04 to 5m/s                |
| Accuracy:       | ± 1.5% reading above 0.15m/s        | ± 2.5% reading above 0.5m/s |
|                 | ±0.004m/s below 0.15m/s             | ± 0.001m/s below 0.5m/s     |
| Impeller:       | 125mm dia. by 0.27m pitch           | 50mm dia. by 0.10m pitch    |
| Materials       |                                     |                             |
| Motor body:     | Black Acetal                        |                             |
| Impeller:       | High Impact Styrene                 |                             |
| Impeller shaft: | Stainless Steel on Jewelled Bearing |                             |

| Catalogue No:   | Description  |
|-----------------|--|
| <b>AG41-206</b> | Large Current Flow Meter Wading set, Comprising Flow Meter with 125mm diameter impeller, Digital Display Unit, 3 x 0.5m stainless steel wading rods, complete with base plate, direction knob, 2m cable, carrying case and operation manual. |
| <b>AG41-200</b> | Large Current Flow Meter Suspension Set, Comprising flow Meter with 125mm diameter impeller, tail fin, suspension bar digital display unit, 35m suspension cable, carrying case and operation manual.  |
| <b>AG41-202</b> | Small Current Flow Meter Wading set, Comprising Flow Meter with 50mm diameter impeller, Digital Display Unit, 3 x 0.5m stainless steel wading rods, complete with base plate, direction knob, 2m cable, carrying case and operation manual.  |
| <b>AG41-206</b> | Small Current Flow Meter Suspension Set, Comprising Flow Meter with 50mm diameter impeller, tail fin, suspension bar digital display unit, 35m suspension cable, carrying case and operation manual.   |

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## Electromagnetic Flow Meters

This small electromagnetic flow meter has been designed specifically for use in open channels where fouling by weed or sewage can be a problem. A high precision instrument which can be relied upon to give accurate readings ( $\pm 0.5\%$  of reading plus zero stability) over a wide flow range ( $\pm 5$  m/sec) in only 5cm of water. The control display unit provides a choice of averaging modes, standard deviation of the data, and a logging facility for recording up to 999 averaged readings.

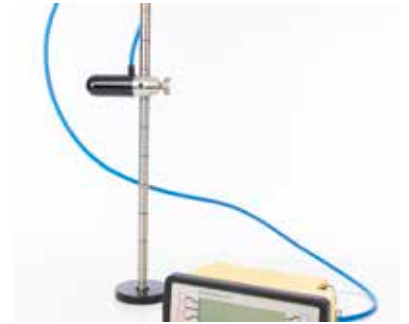
Two sensor types are available, to suit different application requirements. One for measuring speeds in water depths of 15cm or more, and one for 5cm or more. Both offer excellent durability, reliable accurate data, and are suitable for use in clean water and dirty or difficult environments.

### Calibration

Both instruments are calibrated to NAMAS traceable standards for speeds up to 1m/s.

| Specifications         | Cylindrical Type                                     | Flat Type   |
|------------------------|--|---|
| Range:                 | -5m/s to +5m/s                                       | -5m/s to +5m/s                                    |
| Accuracy:              | $\pm 0.5\%$ of reading plus 5mm/s                    | $\pm 0.5\%$ of reading plus 5mm/s                 |
| Zero Drift:            | $\pm 0.004$ m/s below 0.15m/s                        | <5mm/s  |
| Sensing Volume:        | Sphere of approx 12cm diameter around sensor         | Cylinder of approx 20mm $\varnothing$ x 10mm high |
| Minimum Depth:         | 15cm   | 5cm   |
|                        | Display Unit   |   |
| Size, cm/ Weight:      | 25 x 16 x 10/ 2kg                                    |   |
| Environmental:         | Sealed to IP67                                       |   |
| Power:                 | 8 x alkaline C cells, lasting for up to 37 hours     |   |
| Operating Temp:        | -5°C to +50°C (display unit) -5°C to + 40°C (sensor) |   |
|                        | Wading Set   |   |
| Dimensions and weight: | 62 x 42 x 34cm, 9kg                                  |   |

| Catalogue No:   | Description   |
|-----------------|---|
| <b>AG41-120</b> | Electromagnetic Flow Meter Wading Set, with single axis cylindrical sensor (water depths of 15cm or more), 3m cable, control display unit (with logging facility), wading rod set c/w 3 x 0.5m graduated rods, base, direction knob and operation manual. Supplied complete in large carrying case. |
| <b>AG41-122</b> | Electromagnetic Flow Meter Wading Set, with single axis flat sensor (water depths of 5cm or more), 3m cable, control display unit (with logging facility), wading rod set c/w 3 x 0.5m graduated rods, base, direction knob and operation manual. Supplied complete in large carrying case.         |





# Water Level Monitoring

Water level measurements form the basis of hydrological soil examination (porosity of the soil, determination of the current direction of the groundwater etc.)

Several widely used systems are displayed here that allow for the recording of water levels in applications such as in bore holes, casing tubes, well pipes, water wells, open water, and tanks.

AG42-100



## Dipmeter

Wagtech dipmeters are robust, light and convenient in use, and are all fitted with an extremely strong tape marked in metres and centimetres. The tape is wound on a plastic coated metal carrying frame.

Dipmeters produce an audio signal when the probe contacts a water surface.

- Shrouded probe, stainless steel, 15mm diameter x 190m length
- Lightweight and durable
- Reinforced flat tape with close interval markings
- Available with optional temperature measurement
  - \* Longer lengths available on request

AG42-200



| Catalogue No | Length of tape |
|--------------|----------------|
| AG42-100     | 25m            |
| AG42-102     | 50m            |
| AG42-104     | 100m           |
| AG42-106     | 150m           |
| AG42-108     | 200m           |

## Well and Swing Samplers

The Well sampler is manufactured in 316 stainless steel with internal UPVC valves, 250ml capacity and used with a vertical deployment. The swing sampler is designed for sampling from horizontal flowing stream. With 1.83m (6ft) to 3.66m (12ft) extending fibreglass pole with swing-hinged head and 960ml polyethylene bottle which is held firmly to the head with a snapper ring. The bottle is also supplied with a polyurethane lines cap for leak-proof sample storage.

AG42-202



| Catalogue No | Description  |
|--------------|--|
| AG42-200     | Water sampler, stainless steel, 250ml, 32mm o.d. 20m fibre tape                  |
| AG42-202     | Swing sampler - 6-12ft extending fibre glass pole with 960ml Polyethylene bottle |

### NOTE:

For a further range of Sampling Equipment please refer to our General Lab Catalogue.



# Maji Systems

Wagtech-Trace2o offer an impressive range of single and multi-parameter water quality testing instruments, suitable for a range of requirements, from portable testing to long-term deployment. The Maji Systems cater for all budgets and are an ideal choice for those that want to step up their monitoring practices and are concerned with water quality.

There are 4 types of Maji available, which cater for both portable and fixed use, as well as single- and multi-parameter.

## Maji-Lite – Single Parameter

The Maji-Lite is a portable single-parameter meter which has the ability to measure any one of the 8 optical electrodes. The accompanying electrodes are fully interchangeable making the Maji-Lite highly versatile. The sensor is housed in a rugged and pocket-sized aluminium body meaning it is an ideal solution for measuring water quality in the field.

## Maji Probes – Portable Multi-Parameter

The Maji Probes are portable units for on-the-spot measurements of water quality and depth. All probes are constructed from tough marine grade aluminium that has been hard anodised, making them suitable for use in both fresh and salt waters. They consist of an aluminium probe, 3m cable and a hand-held Maji-Meter. If longer cable lengths are required, please contact us.

To carry out water quality analysis the probe is simply lowered into the water and the results are displayed on the hand-held device. The meter has inbuilt GPS to record the exact location in which the results were taken and has the capacity to store over 1000 data sets.

There are 4 models of Maji Probe available which vary depending on the number of additional electrodes you want to add (see pages 62-63).

## Maji Sonde – Fixed Site with Manual Data Collection

The Maji-Sonde an all-in-one multi-parameter device, which features built-in data logging, internal power and a sensor cleaning system meaning it is ideal for discrete long term deployment. This means it can be deployed using only a Kevlar deployment cord, without the need for cables or auxiliary equipment at ground level. The Maji-Sonde measures the 10 standard parameters and has the ability to add up to 6 additional electrodes.

The internal lithium-ion batteries used in the Maji-Sonde are able to provide up to 180 days of continuous logging, and the internal memory has the ability to store up to 150,000 full data sets. Whenever you need to retrieve your water quality data, simply pull the Maji-Sonde out from the water and connect to a PC. Logging regimes are configured using the PC/laptop software included. Full features include:

- Retrieval of logged data
- Full calibration of the instrument with report generation
- Logged data output to spreadsheet and text files
- Setup utility
- Site name and GPS geotagging



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## Maji Stat – Fixed Site with Data Telemetry

The Maji-Stat is an all-in-one fixed site monitoring system with the ability to monitor up to 17 parameters simultaneously. It is an ideal solution for continuous monitoring of boreholes, rivers and dams.

The system uses a self-cleaning Maji-3000 probe permanently fixed in the water course by a 10m cable for continuous logging with minimal maintenance. Also included is a solar-powered data hub with battery, a data telemetry system and one-year access to our online data management hub. This results in a fully self-sustaining system where data is automatically collected, recorded, transmitted and displayed online with no human interaction.

Existing infrastructure can be used to house the data hub, probe and solar panel or Wagtech can provide bespoke solutions tailored to the specific location. Full installation, commissioning and training is available upon request. Data logging & transmission features:

- Channels can be configured as triggers/alarms
- One dedicated channel for battery voltage
- Rapid data transmission
- Uses local phone network (GPRS/3G) – if signal fails, data is stored locally
- SDI-12, RS-232 and RS-485 compatible

## Ordering Information

All Maji-Lites and Maji Probes are supplied in a package with a GPS Maji-Meter, tough 3m cable, calibration solutions, accessories and rugged carry case. The Maji-Sondes and Maji-Stats are all supplied with all the required infrastructure to set up a fixed monitoring station.



| Description  |          |
|--|----------|
| <b>Maji-Lite</b>   |          |
| Maji-Lite package  | EN27-100 |
| <b>Maji Probes</b>   |          |
| Maji-500- standard parameters + turbidity                                  | EN27-200 |
| Maji-1000- standard parameters + 2 optional electrodes (1 ISE & 1 Optical) | EN27-300 |
| Maji-2000- standard parameters + 4 optional electrodes (unrestricted)      | EN27-400 |
| Maji-3000- standard parameters + 6 optional electrodes (unrestricted)      | EN27-500 |
| <b>Maji-Sonde</b>  |          |
| Maji-Sonde (requires 2x 3.6V Lithium D cells – not included)               | EN27-600 |
| 10m non stretch Kevlar deployment cord including clips.                    | EN27-602 |
| 20m non stretch Kevlar deployment cord including clips.                    | EN27-604 |
| 30m non stretch Kevlar deployment cord including clips.                    | EN27-606 |
| 50m non stretch Kevlar deployment cord including clips.                    | EN27-608 |
| <b>Maji-Stat</b>   |          |
| Maji-Stat  | EN27-700 |





## Standard Parameters

|                            |            |  |
|----------------------------|------------|--|
| Optical Dissolved Oxygen   | Range      | 0 – 500.0% / 0 – 50.00 mg/L  |
|                            | Resolution | 0.1% / 0.01mg/L  |
|                            | Accuracy   | 0- 200%: ± 1% of reading. 200%- 500%: ± 10%                                  |
| Conductivity (EC)          | Range      | 0 – 200 mS/cm (0- 200,000 µS/cm)   |
|                            | Resolution | 3 Auto-range scales: 0 – 9999 µS/cm, 10.00 – 99.99 mS/cm, 100.0 – 200.0mS/cm |
|                            | Accuracy   | ± 1% of reading or ± 1 µS/cm if greater (see note 2)                         |
| TDS*                       | Range      | 0 – 100,000 mg/L (ppm)   |
|                            | Resolution | 2 Auto-range scales: 0 – 9999mg/L, 10.00 – 100.00g/L                         |
|                            | Accuracy   | ± 1% of reading or ± 1 mg/L if greater (see note 2)                          |
| Resistivity*               | Range      | 5 Ω•cm – 1 MΩ•cm   |
|                            | Resolution | 2 Auto-range scales: 5 – 9999 Ω•cm, 10.0 – 1000.0 KΩ•cm                      |
|                            | Accuracy   | ± 1% of reading or ± 1 Ω•cm if greater (see note 2)                          |
| Salinity*                  | Range      | 0 – 70 PSU / 0 – 70.00 ppt (g/Kg)  |
|                            | Resolution | 0.01 PSU / 0.01 ppt  |
|                            | Accuracy   | ± 1% of reading or ± 0.1 unit if greater (see note 2)                        |
| Seawater Specific Gravity* | Range      | 0 – 50 σt  |
|                            | Resolution | 0.1 σt   |
|                            | Accuracy   | ± 1.0 σt   |
| pH                         | Range      | 0 – 14 pH / ± 625mV (see note 3)   |
|                            | Resolution | 0.01 pH / ± 0.1mV  |
|                            | Accuracy   | ± 0.1 pH / ± 5mV   |
| ORP                        | Range      | ± 2000mV (see note 3)  |
|                            | Resolution | 0.1mV  |
|                            | Accuracy   | ± 5mV  |
| Temperature                | Range      | -5°C – +50°C (23°F – 122°F)  |
|                            | Resolution | 0.1°C/F  |
|                            | Accuracy   | ± 0.5°C  |
| Depth                      | Range      | 75mm to 100m   |
|                            | Resolution | ± 0.5% FS  |
|                            | Accuracy   | 1cm  |

## Optional Parameters

| Product                            | Number of Electrodes               |
|------------------------------------|------------------------------------|
| Maji-Lite                          | 1 Optical                          |
| Maji-500                           | 10 standard                        |
| Maji-1000                          | 10 standard + 1 Optical & 1 ISE    |
| Maji-2000                          | 10 standard + up to 4 unrestricted |
| Maji-3000, Maji-Sonde & Maji-Sonde | 10 standard + up to 6 unrestricted |





## Ion-Selective Electrodes (ISE)

|                     |            |  |
|---------------------|------------|--|
| Ammonium / Ammonia† | Range      | 0 – 9,000mg/L (ppm)  |
|                     | Resolution | 2 Auto-range scales: 0.00 – 99.99 mg/L, 100.0 – 9,000 mg/L   |
|                     | Accuracy   | ± 10% of reading   |
| Chloride            | Range      | 0 – 20,000mg/L (ppm)   |
|                     | Resolution | 2 Auto-range scales: 0.00 – 99.99 mg/L, 100.0 – 20,000 mg/L  |
|                     | Accuracy   | ± 10% of reading   |
| Fluoride            | Range      | 0 – 1,000mg/L (ppm)  |
|                     | Resolution | 2 Auto-range scales: 0.00- 99.99 mg/L, 100.0 – 999.9 mg/L    |
|                     | Accuracy   | ± 10% of reading   |
| Nitrate             | Range      | 0 – 30,000mg/L (ppm)   |
|                     | Resolution | 2 Auto-range scales: 0.00- 99.99 mg/L, 100.0 – 29,999.9 mg/L |
|                     | Accuracy   | ± 10% of reading   |
| Calcium             | Range      | 0 – 2,000mg/L (ppm)  |
|                     | Resolution | 2 Auto-range scales: 0.00 – 99.99 mg/L, 100.0 – 2,000 mg/L   |
|                     | Accuracy   | ± 10% of reading   |

## Optical Electrodes

|  |                       |   |
|--|-----------------------|---|
| Turbidity  | Range                 | 0 – 3000 NTU  |
|  | Resolution            | 2 Auto-range scales: 0.0 99.9 NTU, 100 – 3000 NTU       |
|  | Repeatability         | ± 2% of reading   |
| Chlorophyll                                      | Range                 | 0 – 500 µg/L (ppb)                                      |
|  | Resolution            | 0.01 µg/L   |
|  | Repeatability         | ± 2% of reading   |
| Phycocyanin<br>(Freshwater Blue<br>-Green Algae) | Range                 | 0 – 300,000 cells/mL                                    |
|  | Resolution            | 1 cell/mL   |
|  | Repeatability         | ± 2% of reading   |
| Phycocerythrin<br>(Marine Blue-<br>Green Algae)  | Range                 | 0 – 200,000 cells/mL                                    |
|  | Resolution            | 1 cell/mL   |
|  | Repeatability         | 400 cells/mL  |
| Rhodamine<br>WT Dye                              | Range                 | 0 – 500 µg/L (ppb)                                      |
|  | Resolution            | 0.01 µg/L   |
|  | Repeatability         | ± 5% of reading   |
| Fluorescein<br>Dye                               | Range                 | 0 – 500 µg/L (ppb)                                      |
|  | Resolution            | 0.01 µg/L   |
|  | Repeatability         | ± 5% of reading   |
| Refined Oil                                      | Range / Repeatability | 0 – 10,000 µg/L (ppb)                                   |
|  | Resolution            | 0.1 µg/L  |
|  | Repeatability         | ± 10% of reading  |
| CDOM/FDOM  | Range                 | 0-2,000mg/L (ppm)                                       |
|  | Resolution            | 2 Auto-range scales: 0.00- 99.99 mg/L, 100.0- 2,000mg/L |
|  | Repeatability         | ± 10% of reading or 2ppm (whichever is greater)         |

† Ammonia readings are calculated from Ammonium, pH and temperature electrode values.



## Water Sampling Pump

AG42-210

Ideal for removing samples from shallow wells and surface water sources, including lakes, ponds, and holding pools. The water sampler is lightweight, rugged, easy to use, weather resistant, and requires minimal maintenance. Designed to take a manual sample, it also has the ability to backflush the sample hose once a sample has been taken.

To provide high sample integrity, the water sample never comes in contact with any water sampler components other than the norprene and polyethylene tubing. The tubing is easy to clean and replace. To avoid cross-contamination or lengthy decontamination procedures, simply change the inexpensive tubing between samples.

| Specifications |   |
|----------------|---|
| Flow Rate      | 1000 ml per minute at 1.2m head                                 |
| Maximum Lift   | 6.7m  |
| Pump Tube      | Norprene 6mm ID   |
| Sample Hose    | 4.6 m nylon reinforced polyethylene tubing with intake strainer |
| Enclosure      | Expanded UV protected PVC                                       |
| Dimensions     | 23cm x 19cm x 11.5cm. Weight: 2.7kg                             |

| Catalogue No    | Description  |
|-----------------|--|
| <b>AG42-210</b> | Water Sampling Peristaltic Pump, includes tubing and 3m power cord |
| <b>AG42-212</b> | Polyethylene Tubing (Per M)  |



## Water Level Logger Kits

These water level data loggers offer high accuracy at an affordable price, with no cumbersome vent tubes or desiccants to maintain. They are ideal for recording water levels and temperatures in shallow wells, streams, lakes and freshwater wetlands.

- Available in 4 depth ranges
- No-vent-tube design for easy and reliable deployment
- Durable ceramic pressure sensor for reliable performance
- Memory: 21,700 combined pressure and temperature measurements
- Sample rate: 1 second to 18 hours, fixed or multiple-rate up to 8 user-defined sampling intervals
- Battery life: 5 years (typical) — factory-replaceable
- Fully-sealed housing ensures many years of trouble-free operation.
- Suitable for deployment in water or air; case materials resistant to fuels, solvents and lubricants.
- Calibration certificate included

Includes calibration certificate of accuracy in accordance with NIST-traceable standards at three pressure points distributed throughout the range.

| Water Level Logger Specifications      |                       |                       |                         |
|--|-----------------------|-----------------------|-------------------------|
| Range                                  | 0-4 m                 | 0-9 m                 | 0-30 m                  |
| Factory Calibrated Range (0° to 40° C) | 69 to 145 kPa         | 69 to 207 kPa         | 69 to 400 kPa           |
| Water Level Accuracy (Typical Error)   | ±0.3 cm               | ±0.5 cm               | ±1.5 cm                 |
| Resolution                             | 0.14 cm               | 0.21 cm               | 0.41 cm                 |
| Burst Pressure                         | 310 kPa<br>18 m depth | 310 kPa<br>18 m depth | 500 kPa<br>40.8 m depth |

Water Level Logger & Sensor



Water Level Logger Kit (Without Case)







AG42-310

## Data Retrieval Units

### Waterproof Shuttle



Data Retrieval Units

Waterproof Shuttle

- Can be used either as a data shuttle or an Optic USB Base Station
- Supports all Optic USB loggers
- Outdoor or underwater data readout
- Convenient direct USB connection to host computer
- Waterproof to 20 m
- Checks and indicates its own battery status

#### Specifications

|                              |                                     |
|------------------------------|-------------------------------------|
| 4 MB non-volatile memory:    | Up to 63 loggers                    |
| Operating temperature range: | 0° to 50°C                          |
| Battery life:                | 1-year (typical) — user-replaceable |
| Software:                    | Pro software                        |
| Dimensions, cm/ Weight, g:   | 15.2 x 4.8/ 150                     |

### Base Station



- Provides fast optical infrared (IR) communications for easy launch and read out of all Pendant loggers
- Connects via USB cable to host computer while Coupler attaches the logger to Base Station
- Splash-resistant

#### Specifications

|                              |                   |
|------------------------------|-------------------|
| Operating temperature range: | Range 0° to 50° C |
| Cable length:                | 180 cm            |
| Offloads full 64K logger:    | 30 Seconds        |

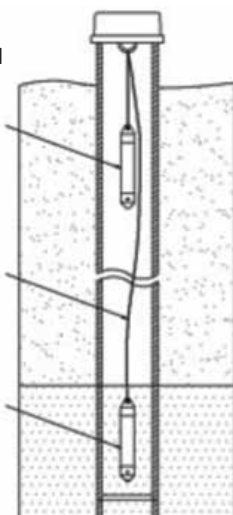
| Water Level Logger Kitsv |                 |                               |                 |   |                  |                                      |
|--------------------------|-----------------|-------------------------------|-----------------|---|------------------|--------------------------------------|
| Catalogue No             | AG42-310        | AG42-312                      | AG42-314        | AG42-316                                  | AG42-318         | AG42-320                             |
| Logger Range:            | One logger 0-4m | Kit includes two 0-4m loggers | One logger 0-9m | Kit includes one 0-4m and one 0-9m logger | One logger 0-30m | Kits includes one 0-4m and one 0-30m |
| Communications:          | Base station    | Waterproof shuttle            | Base Station    | Waterproof shuttle                        | Base Station     | Waterproof shuttle                   |
| Carrying Case:           | Not included    | Included                      | Not included    | Included                                  | Not included     | Included                             |
| Software:                | Included        |                               |                 |   |                  |                                      |
| Logger Housing:          | Stainless steel |                               |                 |   |                  |                                      |

### Water Level Logger Kit (With Case)

Optional additional logger for barometer pressure compensation

Suspension cable

Water level logger



Ground level

Water level



| Specifications  | Carrying Case |
|-----------------|---------------|
| Dimensions, cm: | 40 x 25 x 5   |
| Weight, kg:     | 3             |

General Survey

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## Wagtech Water Level Monitor

A Water Level Monitor consisting of a datalogger with a submersible pressure transducer for remote monitoring and recording of water level, flow and pressure data. Constructed with an acrylic coat to protect the electronics from condensation. This water testing instrument is easy to use and install, and can be used in various applications such as groundwater monitoring, irrigation canals, wetlands, infiltration/inflow studies and many more.

- Water level logger records over 81,000 readings
- Measures water depth down to 150m
- Accurate water level measurements ranging from 1m to 76m
- Automatic barometric pressure and temperature compensation

### Data Logger

|                   |   |
|-------------------|---|
| Memory:           | Non-volatile flash memory                         |
| Battery life:     | Up to 1 year                                      |
| Resolution:       | 12 bit  |
| Humidity:         | 0-95% non-condensing                              |
| Storage capacity: | 81,759 time and date stamped data points          |
| Enclosure, mm:    | 48 x 292, weather resistant cylindrical enclosure |
| Weight, kg:       | 0.7 (inc battery and cable)                       |
| Communication:    | USB   |

### Pressure Transducer

|           |  |
|-----------|--|
| Accuracy: | ±0.1% of full scale at constant temperature, ±0.2% |
| Material: | Stainless steel housing and microscreen            |

### Cable

|         |  |
|---------|--|
| Length: | Standard 7.5m (other lengths available up to 150m) |
|---------|--|

### Catalogue No:

### Description

|                 |   |
|-----------------|---|
| <b>AG42-300</b> | Water level Monitor: Supplied with datalogger, housed in a Weatherproof cylindrical enclosure, pressure sensor, PC software, 7.5m of cable and 9Vdc battery |
| <b>AG42-302</b> | Extra cable lengths per metre, up to 150 metres   |



### Surface water installation



### Groundwater installation





# Geophysical Testing

Irrigation is the artificial application of water to the soil, and is used for assisting the growing of crops. It assumes a particularly high level of importance for crop production during periods of drought, and also to protect crops from frost.

In the search for new sources of irrigation water, geophysical techniques are widely used particularly in remote regions of the world where groundwater records may be non-existent.

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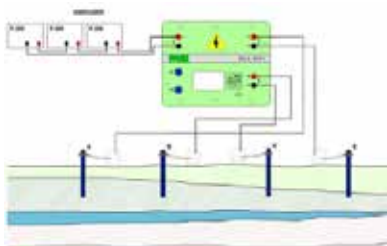
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AG43-050



## Earth Resistivity Meter

This Earth Resistivity Meter provides excellent and reliable performance in a convenient, robust and fully portable design. Ideally suited for subsoil groundwater prospecting at shallow, medium and great depth, it can also be used for geological stratigraphy, studies of salt water contamination in fresh water layers, landslide monitoring, mineral exploration and archaeological research.

- Creation of energetic wave based upon the parameters supplied by the user
- Fast downloading of data through RS232
- Easy to operate menu for quick learning
- More than 50 hours of battery life
- Automatic calibration at every switch-on
- Light and compact structure in a sturdy weatherproof case

Complete unit comprises of the following:

- Earth Resistivity measuring unit
- Cable reel with 300m cable (section 1mm) x2
- Cable reel with 100m cable (section 1mm) x2
- Rechargeable accumulator (200V, 500mA) x2
- Copper electrode x2
- Inox steel electrode x2
- 1.25kg Mallet x2

### Specifications

|                              |  |
|------------------------------|--|
| Energization Curve:          | May be customised to suit the following parameters:<br>Positive and negative wave length:<br>0.1 - 9.9 seconds (impl. at 25 seconds)<br>Time between positive and negative wave:<br>0.1 - 9.9 seconds<br>Intercycle time: 1 - 99 seconds<br>Number of cycles: 1 - 99 |
| Resolution:                  | 610 nV, 126, 8nA   |
| Number of readouts per wave: | 3 readouts of voltage and 3 readouts of current, consecutively and at wave term  |
| Voltage range for VMN:       | From +/-20mV to +/-1280 V (automatically selected)   |
| Memory:                      | Up to 1500 measures  |
| Recommended energiser:       | 600V (1200V peak-peak), 0.5A max   |
| Noise suppression:           | Superior to 98 db at 50-60 Hz  |
| Power supply:                | 2x internal rechargeable battery 6V - 4A/h   |
| Operating temperature:       | 0 - 60°C   |
| Physical dimensions, cm:     | 38 x 27 x 15 (shock proof case)  |
| Weight, kg:                  | 7  |

| Catalogue No: | Description             |
|---------------|-------------------------|
| AG43-050      | Earth Resistivity Meter |



# Crop Science

Crop science is concerned with the scientific approaches that serve to enhance and maintain the quality of crops. Plant related factors are as essential to effective crop productivity as the quality of soil. The purpose of crop science is to exemplify how plants utilise primary inputs such as water and solar energy, and to thus provide methods and practices that serve to facilitate successful irrigation scheduling.

This section comprises of a wide variety of equipment that enable the user to effectively and efficiently monitor, test, and manipulate samples. This will in turn, serve to ensure that a particular variety has the best possible chance to survive and flourish in a given environment and to ultimately produce optimum yields.

Plant Physiology is physiological research which comprises a study of all kinds of processes taking place in growing plants or their environment. The following section contains a range of quality equipment for carrying out the principle physiological determinations on growing plants from the analysis and prevention of disease and insect damage, to growth, and the extent to which plants utilise and assimilate nutrients, water and gases.

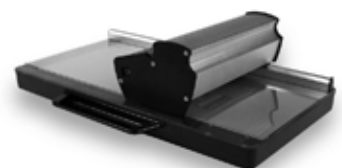
## Portable Laser Leaf Area Meter

AG51-020

The Portable Laser Area Meter uses advanced laser technology to provide researchers with a precise and convenient way to measure leaf area. The high-resolution laser scanner, data logger, and display are all enclosed in a durable, handheld scanner and detachable palette.

It is used to perform non-destructive measurements on the leaves of living plants by placing the leaf on the palette and sliding the scanner over the leaf, enabling collection of data from the same plant, or even the same leaf, throughout its life span. The transparent, protective sheath on the palette makes it easy to capture precise leaf area measurement on tender or intricate leaves.

| Catalogue Number | Description                                  |
|------------------|--|
| AG51-020         | Measuring Thickness: 1.5cm maximum           |
|                  | Measuring Width: 15cm maximum                |
|                  | Measuring Length: 36cm                       |
|                  | Scanner: 670nm laser                         |
|                  | Resolution: 0.01cm <sup>2</sup>              |
|                  | Accuracy: ±1% for samples >10cm <sup>2</sup> |
|                  | Interface : USB 2.0                          |
|                  | Memory Size: 8,000 measurements              |
|                  | Dimensions: 385 x 290 x 125mm                |
|                  | Weight: 1,500g                               |
|                  | Display: 16 characters x 2 lines LCD         |
|                  | Scanning Speed: 200mm/second                 |
|                  | Battery: 7.2 volt rechargeable NiMH          |
|                  | Battery Capacity: Over 250 scans per charge  |
|                  | Operating Temperature: 0-50°C                |





AG51-060

## Handheld Plant Photosynthesis System



The Handheld Photosynthesis System is a portable, single-handed tool that measures photosynthesis, respiration, transpiration, stomatal conductance, PAR and internal CO<sub>2</sub>. Light-weight and durable, it was designed for field use. The optional accessory modules allow researchers to control CO<sub>2</sub>, H<sub>2</sub>O, temperature, light intensity, and measure chlorophyll fluorescence, while the ten different customized chambers accommodate any leaf size, including conifer needles and cacti. Direct chamber connection to the CO<sub>2</sub>/H<sub>2</sub>O gas analyser reduces measurement delay and enables rapid measurement of gas exchange with minimal delays.

- Lightweight and optimized for single-handed operation
- Stable analysers for accurate CO<sub>2</sub> and H<sub>2</sub>O measurements
- Accommodates open and closed system measurements
- Infrared, non-contact leaf temperature sensor
- Ten interchangeable chambers customized for different leaf types
- Custom soil respiration chamber
- Control modules for light, temperature control, CO<sub>2</sub> / H<sub>2</sub>O supply and chlorophyll fluorescence measurement
- Chlorophyll fluorescence and photosynthesis measured simultaneously

| Main Unit             |  |
|-----------------------|--|
| Main Unit             | On board IRGA for CO <sub>2</sub> Analysis, H <sub>2</sub> O Analysis with humidity sensor capacitor, Flow Control, Pump, Display and Key Board, Leaf Chamber attachment ports and Battery |
| Display               | LCD 40 x 6 characters or 320 x 64 pixel  |
| Data Storage          | 4 MB Internal FLASH RAM  |
| Data Output           | USB  |
| Flow Rate             | 100 ~ 1000 cm <sup>2</sup> / min   |
| Operating Temperature | 0-45° C  |
| Operating RH          | 0-90% non-condensing   |
| Power Supply          | 7.2 VDC, 4400 mAh for 5 hours continuous use, extended hours of use with additional batteries. AC Adapter/Battery Charger supplied   |
| Weight                | 1.5kg with Battery   |
| Dimensions            | 440 mm x 55 mm x 50 mm   |

| CO <sub>2</sub> Analyser |   |
|--------------------------|---|
| Sensor                   | Low power Non-Dispersive Infrared Gas Analyser      |
| Chopping Frequency       | 1Hz   |
| Sensors Response Time    | 35 seconds  |
| Source Life              | 5,000 hours   |
| Measuring Range          | 0 to 2000 ppm (Standard) - 0 to 3000 ppm (Optional) |
| Resolution               | 0.1ppm  |
| Repeatability            | ±0.1 ppm (short term)                               |
| Accuracy                 | < ± 2% up to 2000 ppm                               |
| Sample Cell              | 100 mm x 10.2 mm                                    |

| H <sub>2</sub> O Analyser |  |
|---------------------------|--|
| Sensor Type               | Humidity Sensitive Capacitor                               |
| Stability                 | Stable analyser for accurate H <sub>2</sub> O measurements |
| Measuring Range           | 0 to 100%  |
| Resolution                | 0.1%   |
| Accuracy                  | ±2% at 10% RH, ±3.5% at 95% RH                             |

| PAR Measurement |   |
|-----------------|---|
| Sensor Type     | Filtered GaAsP - Photodiode                   |
| Measuring Range | 0 ~ 2500 μmol m <sup>-2</sup> s <sup>-1</sup> |
| Accuracy        | ±5 μmol 0-2500 μmol / m <sup>2</sup> / sec    |

| Chamber Temperature Measurement |                                  |
|---------------------------------|----------------------------------|
| Sensor Type                     | Thermocouple                     |
| Display                         | LCD 40x6 characters 320x64 pixel |
| Measuring Range                 | -15 ~ 50°C                       |
| Accuracy                        | ±0.1°C                           |

| Leaf Temperature Measurement |                 |
|------------------------------|-----------------|
| Sensor Type                  | Infrared Sensor |
| Measuring Range              | -10 ~ 50°C      |
| Accuracy                     | ±0.3° C         |

### Optional Accessories

| Catalogue Number | Description                                      |
|------------------|--|
| AG51-062         | Light Module                                     |
| AG51-064         | CO <sub>2</sub> & H <sub>2</sub> O Supply Module |
| AG51-066         | Temperature Control Module                       |
| AG51-068         | Chlorophyll Fluorescence Module                  |
| AG51-070         | Soil Respiration Chamber                         |





## Chlorophyll Content Meter

Chlorophyll absorbs sunlight and uses its energy to synthesise carbohydrates from CO<sub>2</sub> and water. This process is known as photosynthesis and is the basis for sustaining the life process of all plants. Changes in chlorophyll content can occur as a result of nutrient deficiencies, exposure to environmental stress, exposure to certain herbicides and differences in light environment during growth (shading). Designed to non-destructively measure the chlorophyll concentration of leaf tissue without the need to detach and grind a sample. The unit offers accurate, reliable and easily repeatable measurements, all in one lightweight, weatherproof design which is optimised for field work. The measurements are rapid and simple to obtain, allowing researchers and agronomists to gather and evaluate data quicker and more efficiently than ever before.

Especially useful for improving Nitrogen and Fertilizer management programs, this device is also ideal for crop stress, leaf senescence, plant breeding, herbicide activity, health determination and quality control studies; a tool that is aptly suited to both teaching and research applications.

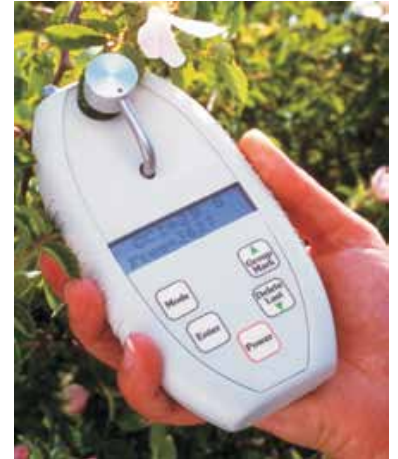
- Fast, accurate, and easily repeatable measurements
- Large sampling area
- Internal data logging
- Stand alone operation - no P.C. required
- User friendly operation
- USB connection

| Catalogue No | Description   |
|--------------|---|
| AG51-050     | Measured parameters: Optical absorbance in two wavebands  |
|              | Measurement area: 9.5mm diameter circle   |
|              | Accuracy: +/- 1 CCI unit  |
|              | Source: 2 LEDs's  |
|              | Detector: Silicon photodiode with integral amplifier for absorbance measurements and source power monitoring for temperature compensation |
|              | Memory: 160,000 measurements  |
|              | Temperature range, °C: 0-50   |
|              | Temperature drift: Temperature compensated source and detector for minimum drift over full range  |
|              | Power source: 9V Alkaline battery   |
|              | Weight, g: 162  |
|              | Dimensions (l x w x d), mm: 152 x 82 x 25   |

### NOTE:

#### Wagtech Plant Tissue Analysis Kit:

You can also find the Chlorophyll Content Meter in the Wagtech Plant Tissue Analysis Kit on page 50.





AG51-100

## Plant Moisture System - Digital



This fully portable plant moisture system can be used for observations in the field, and allows for plant observations in accordance with the Scholander method. The demand for water in the plant is a combination of many factors including the availability of water to the roots, environmental factors (for example temperature, wind, humidity, solar radiation) and the ability of the plant to move water.

Water potential is a clear indication of water deficiency in a plant and of the ability of the plant to absorb water. Fluctuations of water potential imply changes in growth, proteins and photosynthesis, and thus portray an accurate picture of developmental changes within the crop.

The leaf of a plant is placed in a pressurization chamber by sealing the leaf stem in the removable neck of the chamber, allowing for the operator to observe the stem, while the chamber is being pressurised. Pressurization takes place in the air cylinder, which can easily be refilled. The chamber pressure is measured by a semi-conductor transducer, while a large LCD screen provides a read out.

- Main chamber is machined from a single piece of solid, high grade brass, there are no metal joints and seams to fail under high pressures
- Chamber head is secured using a quick fastening, multi start thread, ensuring the chamber cannot be pressurised unless the head is secure
- Safety release pressure valve is fitted to each system, this is set to automatically evacuate the chamber lid if the maximum working pressure is exceeded at any time.

| Specifications             |  |
|----------------------------|--|
| Operating pressure:        | 0 to 40 Bar                            |
| Chamber dimensions, mm:    | 135 x 70 diameter                      |
| Chamber volume, L:         | 0.54                                   |
| Dimensions, cm/ Weight, kg | 15 x 32 x 25/ 9 (excluding gas bottle) |
| Power:                     | 9V Battery                             |

| Catalogue No | Description  |
|--------------|--|
| AG51-100     | Plant Moisture System, supplied complete with 3 litre air bottle, regulator and 'A' clamp for bottle, pressure head, 6mm specimen adapter, set of 10 stem seals, flexible hose to collect PMS to regulator/bottle, safety screen and safety goggles. |

AG53-130



## Manual Dendrometer

The Dendrometer is a simple tool that allows you to manually measure changes in the circumference of tree stems over time. It is designed to be installed, left in place and periodically visited to record changes in the circumference resulting from tree or stem growth. The dendrometer measures trees with diameters from 10 to 66 cm. Stems < 40cm in diameter should use the short spring and stems > 40cm in diameter should use the longer spring.

| Catalogue Number | Description                                |
|------------------|--|
| AG53-130         | Thermal Elongation: 75x10-6 /K             |
|                  | Tensile Strength: 64 N/mm <sup>2</sup>     |
|                  | Coefficient of Friction: 0.5 on dry bark   |
|                  | Operating Temperature: -30°C to 60°C       |
|                  | Weight of Band, g: 16                      |
|                  | Weight of Spring, g: 7 (short), 14 (long)  |
|                  | Dimensions L x W x T (mm): 2100 x 15 x 0.5 |

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## Sapflow Measurement

The “Heat Ratio Method (SFM)” is a modification of the “Compensation Heat Pulse Method (CHPM)”. SFM represents an improvement on CHPM in that it can also be used to measure very small flow rates and even reverse flow rates. It is possible using this method to determine sap flows in trunks, stalks and roots of various types and sizes of plants under different ecological conditions, right through to drought.

A short heat pulse is the tracer for this thermometric method of measuring sap flows in xylem tissue. It is possible to calculate the quantity and direction of the sap flow from the ratio of the amount of heat transported to two symmetrically arranged temperature sensors.

- Reliable recording of very small and even reverse flow rates
- Autonomously operating plug & play system
- No additional insulation required

| Catalogue No | Description   |
|--------------|---|
| AG51-150     | Raw temperature: °C   |
|              | Heat pulse velocity: CM/ Hr   |
|              | Sap velocity: CM/ Hr  |
|              | Sapflow: Litres/ Hr   |
|              | User adjustable heat pulse: 250 Joules (approx.) equivalent to a 2.5 second heat pulse duration |
|              | Weight, g: 250  |
|              | Dimensions (l x w x d), mm: 125 x 50 x 25   |

## Plant Tissue Analysis Kit

The Plant Tissue Analysis Kit is designed to equip the agronomist and farmer with simple instruments to assess the health of his crops by analysing the plant tissue. Plant sap can be tested using the instruments in the Plant Tissue Analysis Kit as soon as the leaves of the crop are large enough to be able to obtain several drops for testing using the Mini Plant Press included with the kit

### The kit is supplied complete with the following:

- Hand Held Refractometer
- Pocket pH, and EC Testers
- Chlorophyll Meter
- Infra red thermometer
- Plant tissue colour charts
- Pocket penetrometer
- Full instruction manual covering the use of the instruments and interpretation of the results

### The following tests can be performed using the instruments in the kit:

#### Hand Held Refractometer

This measures total dissolved solids-TDS (or Brix) which indicates the level of balance of nutrient uptake and complexing into sugars or proteins in the photosynthesis factory - the leaf. If Brix is low, even after several hours of sunshine, some element(s) are missing in the photosynthesis factory. Ions, if present, have not been “complexed” into sugars or proteins.

#### Pocket pH Tester

pH, indicates elements which may be out of balance. A pH of less than 6.4, may indicate a need for calcium, magnesium, potassium or sodium while a pH of greater than 6.4 phosphates or sulphates may be required. If the proper elements are selected and applied, the Brix reading will increase and the pH will go to the desired level of approximately 6.4.

AG51-150



AG51-200







**Pocket EC Tester**

EC or conductivity, indicates the level of simple ion uptake into the plant sap. If a crop has a low Brix reading and if sap EC is also too low, elements are not being made available to the plant and appropriate measures should be taken to correct this.

**InfraRed Thermometer**

This is used to measure the foliage temperature. The higher this is above ambient air temperature, the more stress the plant is exhibiting.

**Chlorophyll Meter**

The measurement of chlorophyll in a crop can be useful in determining if the levels of nitrogen are low.

**Pocket Penetrometer**

Measures soil penetration resistance and indicates the physical condition of the ground and suitability for plant growth.



| Catalogue No | Description  |
|--------------|--|
| AG51-200     | Plant Tissue Analysis Kit, supplied complete with hand held refractometer, pocket pH and EC testers, chlorophyll meter, infra red thermometer, plant tissue colour charts, pocket penetrometer, mini plant press, deionised water pack, beakers, and full instruction manual, all housed in a robust carrying case |

AG51-220

**Leaf Porometer, Hand Held**



A hand held leaf porometer that measures the amount of water being evaporated from a leaf through small pores in the leaf known as stomata. The device measures stomata conductance by putting a leaf in series with two known conductance elements, and comparing the humidity measurements between them.

- Manual and Auto read mode options
- Automatic sampling mode removes user subjectivity
- No daily calibration
- No tubes, pumps, fans, moving parts or heavy equipment
- Accurate steady-state measurement
- Very simple, easy-to-use interface
- Includes software for downloading data
- Robust Design

AG51-240

| Catalogue No | Description   |
|--------------|---|
| AG51-220     | Conductive range: 0-1000 mmol m <sup>-2</sup> s <sup>-2</sup> |
|              | Operating environment: 5-40°C, 10-90% RH, non-condensing      |
|              | Data storage: 4095 measurements in flash memory               |
|              | Measurement time in auto mode: 30 seconds                     |
|              | Measurement aperture: 6.3mm diameter                          |
|              | Power: 4 AA alkaline cells                                    |
|              | Battery life: More than 1 year                                |



**Plant Tissue Colour Charts**

These 17 colour charts are used to determine and record the colour of plant tissues. This information is important to scientists working with growth rates, nutrient deficiencies, plant diseases and other plant processes. The set contains 320 matte colour chips which are permanently mounted on charts of 17 hues.

| Catalogue No | Description                |
|--------------|----------------------------|
| AG51-240     | Plant Tissue Colour Charts |



## Fenwick Can

The Fenwick Can is the most commonly used instrument for the extraction of cysts from soil samples using the principles of flotation. The can tapers toward the top, with a sloping collar around the outside of the rim which collects overflow and directs it towards an outlet. The can has a sloping internal base with a drain plug at its lowest point.

Soil is placed at the bottom of the can. Water is then turned on and enters through a device that creates a swirling action in the bottom of the can. As the can fills, lighter soil particles and nematodes flow over the spout and onto one or more sieves from which nematodes are 'backwashed' after approximately two to five minutes.

| Catalogue No | Description   |
|--------------|---|
| AG51-250     | Fenwick Can, Dimensions, 375 x 200 x 625mm. Weight 3.5 kg. Supplied complete with 850 µm and 250 µm sieves. |

### Accessories

| Catalogue No | Description   |
|--------------|---|
| AG51-252     | Test Sieve: Stainless steel frame and mesh. 200mm diameter, 250 microns |
| AG51-254     | Test Sieve: Stainless steel frame and mesh. 200mm diameter, 850 microns |



AG51-250



## Tullgren Funnels

In use around the world for more than 50 years, Tullgren Funnels provide the best solution for both dry and wet extraction of soil organisms from soil samples.

Tullgren funnels operate as an extraction method for soil animals.

A temperature gradient of approximately 14°C is created in a litter or soil sample, in order to create downward movement of the soil arthropods into a collecting vessel.

- Built in banks of 6 and 12 funnels
- Constructed of steel tubular section, with steel shelves - providing a clean and robust assembly for laboratory use
- Lamps are switched in pairs and the unit will accommodate 25 watt tungsten filament bulbs
- Unit available for floor or wall mounting

| Catalogue No | Description                  |
|--------------|------------------------------|
| AG51-300     | Tullgreen Funnels - 6 banks  |
| AG51-302     | Tullgreen Funnels - 12 banks |

| Specifications                      | AG51-300 (6 Bank) | AG51-302 (12 Bank) |
|-------------------------------------|-------------------|--------------------|
| Diameter of funnels, top, mm:       |                   | 152                |
| Diameter of lower end, mm:          |                   | 14                 |
| Capacity of collecting bottle*, mm: |                   | 50 x 25            |
| Overall height, mm:                 |                   | 826                |
| Overall width, mm:                  | 210               | 381                |
| Overall length, mm:                 |                   | 1003               |
| Weight (approx), kg:                | 18.1              | 31.8               |

\* 50x25mm as standard - Larger vessels can be accommodated



AG51-300



AG51-320



### Spore Trap, Seven-Day Volumetric Recording

A compact unit with a built in vacuum pump, which is designed to capture and quantify a broad spectrum of fungal spores (both culturable and non-culturable) that are present in the air. This instrument can also be used to sample pollen, fibreglass particles, fungus spores, hyphal fragments, hair and skin cells and many more. Particles are impacted on adhesive-coated transparent plastic tape supported on clockwork driven drum.

- Constructed from materials which are light in weight, making it readily portable for field use.
- Unit is treated to ensure a weather and corrosive proof finish
- Quick and easy change over of drums
- Vacuum pump available for use on most voltages and frequencies

| Catalogue No    | Description  |
|-----------------|--|
| <b>AG51-320</b> | Sampling duration: 7 days                              |
|                 | Drum movement: 2mm/hour                                |
|                 | Accuracy: +/- 1 CCI unit                               |
|                 | Throughput at orifice: 10 litres/minute                |
|                 | Orifice size, mm: 2 x 14                               |
|                 | Working area: 0.882m <sup>2</sup> through 530mm radius |
|                 | Height of sampler, mm: 940                             |
|                 | Weight, kg: 16   |

AG51-326



### Pocket Spring-Steel Net Frame

A net that is suitable for the sampling of all flying insects. Unique design allows for the steel frame to twist up and fold to pocket size, making it a compact and fully portable device. Supplied with a short brass handle. Extension handles can be added using the net handle system.

| Catalogue No    | Description  |
|-----------------|--|
| <b>AG51-322</b> | Pocket Spring-Steel Net Frame, 300m frame when opened  |
| <b>AG51-324</b> | Black net bag for the pocket spring-steel net frame  |
| <b>AG51-326</b> | Push-fit net handles. Strong aluminium tubes, black powder coated finish, with push-fit connections. Simply attach to the short brass handle of the net frame. Available in 600mm (2ft) sections). |

AG51-330



### Sweeping Net

A net that is designed for the purpose of collecting in grass and heather etc. It consists of a very strong and durable aluminium frame with stainless steel arms which fold up like an umbrella

| Catalogue No    | Description   |
|-----------------|---|
| <b>AG51-330</b> | Sweeping net with a diameter of 460mm. Supplied complete with white bag with extra strong reinforced heading. |

AG51-350



### Beating Tray

A beating tray is used where insects rely on their natural camouflage for defence and remain still, e.g. in amongst trees and shrubs. A piece of light coloured cloth is stretched between two supports underneath a tree or shrub which is then beaten or vigorously shaken. Insects that have taken refuge there will fall into the tray for collection.

| Catalogue No    | Description  |
|-----------------|--|
| <b>AG51-350</b> | Frame complete with white bag. Folding pattern giving a tray area of approximately 1100mm x 860mm. |

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## Pooters

A pooter is a useful instrument for picking up small invertebrates and depositing them into a collecting chamber. It works like a vacuum cleaner. Suction is applied through the rubber tubing while directing the shorter plastic tube over the target to draw it into the chamber.

Offered here are tough and durable Perspex pooters, and also portable glass pooters.

| Catalogue No | Description  |
|--------------|--|
| AG51-370     | Pocket pooter, Glass. Small pooter with a 75mm x 25mm glass tube, plastic pipes, rubber bung and tubing. |
| AG51-372     | Perspex pooter. Very tough durable material with cork ends and rubber tubing.                            |

AG51-372

AG51-370



## Blendon Butterfly Traps

Instrument for collecting butterflies alive, and is therefore ideal for survey work. Particularly suited to the collection of butterflies in the tropics that feed on rotten fruit etc. Two sizes are available, the strings are fully adjustable for different sized butterflies, and replacement nets are also available.

| Catalogue No | Description  |
|--------------|--|
| AG51-400     | Small butterfly trap, 300mm round base, 650mm high |
| AG51-402     | Large butterfly trap, 400mm round base, 900mm high |

AG51-400



## Robinson Mercury Moth Trap

The best moth trap for quantities and species of moth attracted. The base and cone are made of high impact moulded ABS plastic and the trap is rust-proof, robust and light. Supplied complete as illustrated with all electrical fittings, 50m flex on a cable winder and operating instructions. Designed for 200-250 volt operation.

| Catalogue No | Description                       |
|--------------|-----------------------------------|
| AG51-420     | Robinson moth trap, complete unit |

AG51-420



## Containers, Clear Plastic Rectangular Boxes

A range of clear plastic boxes suitable for collecting and examining specimens.

| Catalogue No | Dimensions, mm: |
|--------------|-----------------|
| AG51-450     | 150 x 117 x 75  |
| AG51-452     | 174 x 115 x 60  |
| AG51-456     | 279 x 159 x 102 |





AG51-470



### Insect Suction Sampler

This is a lightweight and fully portable device, designed to extract insects from herbage or debris, which can easily be operated by one person. The insects collected are immediately visible and there is no need for nets, bags or filters. A wide range in size and shape of collecting vessels can be used and each one can rapidly be removed or replaced for ease-of-use. The collected insects are safely deposited and may be returned to their natural habitat if required.

| Catalogue No | Description                               |
|--------------|---|
| AG51-470     | Air throughput, m <sup>3</sup> /min: 10.5 |
|              | Collecting area, m <sup>2</sup> : 0.2     |
|              | Weight (including engine), kg: 7.8        |
|              | Overall height, mm: 930                   |

**NOTE:**

Please refer to our General Lab Catalogue for a further range of containers.

AG51-660



### Refractometer, Hand Held

A hand held Refractometer used for the determination of sugar content within food stuffs. This device provides high precision with an exceptional optical design that improves image resolution and illumination.

- Water Resistant and Dustproof IP67 Rated: The only Refractometer that features a sealed housing and eyepiece. Cannot be damaged or destroyed by use in dusty or wet environments. Optics inside will not “fog up”
- Shock Resistant: constructed of Xenoy polycarbonate materials and double cemented glass optics that make it an ultra rugged and impact resistant design able to withstand repeated drops from 1m
- Automatic Temperature Control (ATC) - provides accurate and reliable measurements in all environments and conditions. No conversion charts or second guessing required. Measures concentration correctly each and every time

| Catalogue No | Description                       |
|--------------|-----------------------------------|
| AG51-660     | Description: Sugar % (BRIX)       |
|              | Refractive index: 1.3330 - 1.4200 |
|              | Range, %: 0-50                    |
|              | Scale divisions: 0.25             |

**NOTE:**

For a further range of refractometers, please refer to our General Lab Catalogue.

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## Refractometer, Hand Held, Digital

AG51-664

This pocket sized digital refractometer is a powerful, multi-scale instrument that is easy to operate and provides quick results. It has an IP65 dustproof/water resistant rating so it can be used in virtually any environment and is suitable for numerous applications in various industries, including:

- Agriculture
- Beverage
- Beer
- Food
- Industrial
- Wine

This refractometer features a 5-digit, full view screen that displays all pertinent measurement data in one window. This feature reduces the costs associated with reading errors and eliminates the time associated with waiting for scrolling values. It is easy to operate eliminating the need for specialised training. Measurement results display in 2 seconds, which saves time and increases productivity

- 3 measurement scales
- Brix with Automatic Temperature Correction (ATC)
- Refractive Index with Automatic Temperature Correction (ATC)
- Refractive Index at Actual Temperature
- 5-digit, full view LCD screen
- Results display in 2 seconds

| Specification                     | Digital Pocket Refractometer |
|-----------------------------------|------------------------------|
| Refractive Index Reading Range    | 1.3330-1.4465                |
| Refractive Index Reading Accuracy | 0.0002                       |
| Brix Reading Accuracy             | 0.2                          |
| Brix Reading Range                | 0.0 to 62% Brix              |
| Calibration                       | Water                        |
| Prism Material                    | Glass                        |
| Dimensions (WxDxL), mm            | 54 x 27 x 100                |
| Power:                            | 2 x AAA batteries            |

| Catalogue No | Description                  |
|--------------|------------------------------|
| AG51-664     | Digital Pocket Refractometer |



## Thermometer, Laser, Infrared

AG51-668

Temperature measurement is a fundamental component of many agricultural processes from the use by farmers during each stage of the crop cycle to laboratory applications where the standardisation of temperature is essential to ensure accurate and reliable testing conditions.

This compact infrared thermometer provides easy and safe non-contact temperature measurements for a wide variety of applications such as making stress-degree measurements, important in determining when plants or crops should be watered or irrigated.

- Max / min feature
- High intensity laser beam makes targeting objects easy
- Simple operation, point, shoot and read off the temperature
- Complete with carry case, battery and full instructions

| Specifications          | Thermometer            |
|-------------------------|------------------------|
| Range, °C:              | -50 to 550             |
| Response time:          | Less than 1 second     |
| Accuracy:               | ±2% of reading or ±2°C |
| LCD dimensions, mm:     | 19 x 26                |
| Dimensions (hwxwd), mm: | 160 x 82 x 41.5        |

| Catalogue No | Description |
|--------------|-------------|
| AG51-668     | Thermometer |





AG51-670



### Plant Sap Press, Hydraulic

Speed up collection of large samples with this Hydraulic Plant Sap Press which provides a rapid, easy to use method for collecting larger samples. The press extracts sap into a collection vial and comes complete with plunger, grate, cylinder, expeller rod and six collection vials.

| Catalogue No | Description                |
|--------------|----------------------------|
| AG51-670     | Plant Sap Press, Hydraulic |

AG51-672



### Plant Sap Press, Hand Held

A simple to operate, hand held instrument which can be used to extract sap from plants. This device offer a fully portable alternative to the hydraulic plant sap press. Constructed of stainless steel.

| Catalogue No | Description                |
|--------------|----------------------------|
| AG51-672     | Plant Sap Press, Hand Held |

AG51-700



### Fruit Firmness Tester

The firmness of fruit pulp is very important for fruit traders. The harvest date of fruit is fixed with the help of the measurement of the fruit pulp, regarding the shipment date to different customers' countries, or duration of storage. This is a simple to use instrument that reliably measures the firmness of fruits in a non-destructive manner.

| Catalogue No | Description           |
|--------------|-----------------------|
| AG51-700     | Fruit Firmness Tester |

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## Digital Fruit Firmness Tester

AG51-710

This Fruit Hardness Tester Penetrometer measures fruit ripeness and is used to improve fruit quality, harvest, storage, and product transportation time. 4 x Penetrometer tips, (3mm, 5mm, 8mm, & 11mm) for large/hard and small/soft fruits are supplied as standard.

- Measures fruit ripeness to improve fruit quality, harvest, storage, and product transportation time
- Large LCD with back light feature
- Simple operation, point, shoot and read off the temperature
- Basic accuracy of 0.5%
- Tension or Compression, Peak hold and Zero functions
- Positive/Reverse display for easy readability
- RS-232 PC interface



| Specifications        | AG51-710                               |
|-----------------------|--|
| Range, kg             | 20                                     |
| Accuracy              | +/- (0.5% + 2 digits)                  |
| Resolution            | 0.01kg                                 |
| Minimum Display       | 0.02kg                                 |
| Display               | 5 digits, 0.63" (16mm) LCD display     |
| Update Rate           | Fast mode 0.2 secs; slow mode 0.6 secs |
| Full scale deflection | Approx. 0.4mm                          |
| Transducer type       | Load cell                              |
| Peak hold             | Freezes max reading on display         |
| Power                 | 6 x 1.5V AA batteries                  |
| Weight, g             | 550                                    |
| Dimensions, mm        | 215 x 90 x 45                          |

| Catalogue No | Description  |
|--------------|--|
| AG51-710     | Digital Fruit Hardness Tester, supplied complete with 4 x penetrometer tips (for large/hard and small/soft fruits), 6 x AA 1.5V batteries, instruction manual and hard carrying case.  |
| AG51-712     | Digital Fruit Hardness Tester, supplied complete with 4 x penetrometer tips (for large/hard and small/soft fruits), 6 x AA 1.5V batteries, instruction manual and hard carrying case. This model includes data output to a PC. |

### Optional Accessories

| Catalogue No | Description                       |
|--------------|-----------------------------------|
| AG51-714     | USB adapter for use with AG51-712 |

## Fruit Calliper

Universal fruit calliper providing simultaneous reading of diameter (from 25 to 95mm) and circumference (from 8 to 30mm). Portable, hand held device aptly suited for work in the field.

| Catalogue No | Description    |
|--------------|----------------|
| AG51-702     | Fruit Calliper |

## Callipers, Bananas

A hand held device designed to measure the diameter of banana fingers in order to determine the fruit grade.

Quick and easy readings are obtained simply by pressing the calliper button which squeezes against the banana finger and then the diameter is provided in seconds.

| Catalogue No | Description                |
|--------------|----------------------------|
| AG51-704     | Banana calliper, hand held |



AG51-702



AG51-704





AG51-708

### Pocket Magnifier

A high quality 30x magnification pocket microscope with built-in illumination retractable condenser and daylight filter slide. Accurate focussing is facilitated by the provision of rotary control. Supplied complete with lens-ended bulb and protective case.



| Catalogue No | Description      |
|--------------|------------------|
| AG51-708     | Pocket Magnifier |

AG51-720

### Fruit QC Tester



This non-destructive fruit quality control tester uses a near-infrared spectrometer (NIRS) to help establish the optimum harvest time for fruit and vegetables. It can be used for monitoring on-tree fruit ripening, to establish accurately the optimum harvest time and to reduce the variability in fruit batches. It can also be used in cool stores to establish maturity changes and to support research into the fruit maturation.

The Fruit QC Tester measures the chlorophyll content in fruit which is a precise index of a fruit's ripening state and is unrelated to weather conditions, a factor which influences other methods of measurement such as the brix index. The DA index, measured with the Fruit QC Tester, is useful during many stages in the production and consumption's cycle of fruit for example, by farmers to optimize the tree pruning, during harvest, in storage to determine shelf life and maturation state, and by retailers to select the best products for sale.

| Specification                          | AG51-720              |
|--|-----------------------|
| Range:                                 | 0 – 5 DA              |
| Resolution:                            | 0.01                  |
| Calibration:                           | white                 |
| Working temperature                    | 0 – 70°C              |
| Memory                                 | 2 giga byte           |
| Display                                | Alpha-numeric/graphic |
| Download data                          | USB port              |
| Batteries                              | 3 pcs 1,5V AAA        |
| Weight (instrument + batteries + case) | 1.4 kg                |
| Dimensions (case)                      | 25 x 21 x 10.5 cm     |

| Catalogue No | Description   |
|--------------|---|
| AG51-720     | Fruit QC Tester, supplied complete in a carrying case |

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## CO<sub>2</sub>, Temperature, Pressure and Humidity Meter

AG51-806

This hand held CO<sub>2</sub> meter is an efficient instrument for measuring indoor air quality and is also ideal for checking ventilation in green houses, laboratories, mushroom farms, commercial kitchens, etc.

- Clearly structured measurement menu for long-term measurement and parallel determination of CO<sub>2</sub> concentration, humidity, air temperature and degree of turbulence in workplaces
- Calculation of wet bulb temperature, dew point and absolute humidity – determination of the degree of turbulence and draught risk according to EN ISO 7730 / ASHRAE 55
- Wireless probe, internal data storage and USB port for data export



| Specifications        | AG51-806                  |
|-----------------------|---------------------------|
| Probe type            | 2 channel infrared sensor |
| Operating temperature | -5°C to 50°C              |
| Power                 | 4 x AA batteries          |
| Battery life, hours   | 21.5                      |
| Data transfer         | Bluetooth                 |
| Radio range, m        | 20                        |
| Weight, g             | 195                       |
| Dimensions, mm        | 295 x 50 x 40             |

|                            | Range             | Accuracy                         | Resolution |
|----------------------------|-------------------|----------------------------------|------------|
| Temperature                | 0°C to 50°C       | +/- 0.5°C                        | 0.1°C      |
| Humidity                   | 5 to 95 %RH       | +/-3 %RH (10-35%RH)              |            |
| +/-2 %RH (35-65 %RH)       | 4 x AA batteries  |                                  |            |
| +/-3 %RH (65-90 %RH)       | 21.5              |                                  |            |
| +/-5 %RH (remaining range) | Bluetooth         |                                  |            |
| +/-0.06 %RH/K (0-50°C)     | 0.1 %RH           |                                  |            |
| Pressure                   | +700 to +1100 hPa | +/-3 hPa                         | 0.1 hPa    |
| CO <sub>2</sub>            | 0 to 10,000ppm    | +/- 50ppm + 3% of mv (0-5000ppm) |            |

| Catalogue No | Description   |
|--------------|---|
| AG51-806     | Carbon Dioxide Meter, hand held, supplied with attached probe, batteries and calibration protocol |





# Light Measurement

Photosynthetic processes in plants are much dependent upon solar radiation, and there are three principal characteristics of light that affect plant growth: quantity, quality, and duration. Light quantity refers to the intensity or concentration of sunlight. Light quality refers to the colour or wavelength reaching the plant surface. Light duration or photoperiod refers to the amount of time that a plant is exposed to sunlight

AG52-200



AG52-202



Digital Meter



AG52-206



## Pyranometer

An extremely popular and widely used light sensor, this device offers a compact and efficient sensor for solar energy measurements. It gives much greater output than thermopile pyranometers, which, with its better temperature stability, makes it easier to use.

The sensors are calibrated against precision reference thermopile pyranometers in natural daylight, and this item should therefore not be used with artificial or filtered light sources. This limitation to outdoor use is due to the sensor response curve which differs from that of received solar energy. However, because it takes a constant sample of sky light it will always be accurate when used in such conditions outdoors.

In order for data retrieval and subsequent analysis to be undertaken, a datalogger is required. The datalogger shown here is a 1-channel dedicated and reliable system which is easy to use, robust, durable, and completely weatherproof with an ABS housing that is sealed to IP65. The Sensor and Digital Read-out units are also available for purchase as individual components. A levelling unit is also available, and this is recommended for maintaining the sensor at a level height.

|                         |                                   |  |
|-------------------------|-----------------------------------|--|
| <b>Sensor:</b>          | Working range, w/m <sup>2</sup> : | 0 to 5000                              |
|                         | Temperature range, °C:            | -30 to +75                             |
|                         | Humidity range, RH:               | 0-100%                                 |
|                         | Temperature coefficient, °C:      | ±0.2%                                  |
|                         | Construction:                     | Material Delrin - fully sealed to IP68 |
| Weight, g:              | 130 (with 3m cable)               |  |
| Dimensions (h x w), mm: | 38 x 34                           |  |

|                    |                            |   |
|--------------------|----------------------------|---|
| <b>Datalogger:</b> | Operating temperature, °C: | -20 to +70  |
|                    | Memory:                    | Battery packed RAM, 1Mbit, 4000 readings approx.  |
|                    | Communications:            | RS232 ASCII output will communicate with any PC   |
|                    | Power:                     | Standard 6x 'C' batteries (4 to 6 months approx.) |
|                    | Weight, g:                 | 1100  |
| Dimensions, mm:    | 105 x 122 x 120            |   |

| Catalogue No | Description   |
|--------------|---|
| AG52-200     | Pyranometer Sensor with Integral Datalogger                         |
| AG52-202     | Pyranometer Sensor and digital meter with battery and carrying case |
| AG52-206     | Levelling Unit for Sensor   |



## Lux Meter, Digital

AG52-100

A robust and portable hand held light meter. Supplied with carry pouch, rubber boot, protective lens cap and battery.

- Silicon photo diode sensor and spectral response filter
- Measures both lux and foot-candles, user selectable
- Automatic power off after 30 minutes
- Manual range selection over 5 ranges (Lux) and 4 ranges (Fc)
- Easy to read, large 43mm backlit LCD display with 40 segment bar graph

| Specifications             | AG52-100          |
|----------------------------|-------------------|
| Range, Lux                 | 0 to 400,000      |
| Maximum Resolution, Lux/Fc | 0.01              |
| Accuracy                   | +/- 3% of reading |
| Sampling rate              | 2/sec             |
| Operating conditions       | -20°C to 60°C     |
| Power                      | 1 x 9V (inc.)     |
| Dimensions, mm             | 185 x 66 x 33     |



## Quantum Meter

AG52-300

Quantum meters approximate the quantity of photons between 400 and 700 nanometers. Photosynthesis is largely driven by the number of photons between these wavelengths so this radiation is called the Photosynthetic Photon Flux (PPF) and is measured in  $\mu\text{mol m}^{-2} \text{s}^{-1}$  (micromoles of photons per meters squared per second).

This meter includes data recording capability and sun and electric calibration with each meter.

The instrument can store up to 99 manually recorded measurements. In automatic mode, measurements are made every 30 seconds and averages are stored every 30 minutes. Daily totals are also calculated and the past 99 days are recorded. The communication cable (AG52-304) must be purchased to download data to a PC. These meters feature an innovative blue lens for improved spectral response along with a cosine-corrected head, self-cleaning characteristics, and long-term stability.

| Specifications         | AG52-300  |
|------------------------|---|
| Measurement range:     | 0 to 2999 $\mu\text{mol m}^{-2} \text{s}^{-1}$  |
| Operating environment: | 0 to 50 C<br>Less than 90% non-condensing relative humidity up to 30 C<br>Less than 70% relative humidity from 30 to 50 C |
| Memory:                | 99 manually stored data points<br>Automatically store 99 consecutive 30 minute averages<br>99 daily averages              |
| Input Power:           | Standard 3 V coin cell battery  |



| Catalogue No | Description   |
|--------------|---|
| AG52-300     | Quantum Meter and sensor and 5m cable                 |
| AG52-302     | Levelling plate for use with light sensor on AG52-300 |
| AG52-304     | Communication cable for use with AG52-300             |

## UVA and UVB Measurements

AG52-350

Sensors for measuring light levels in the Ultraviolet A and Ultraviolet B wavebands. Ideally suited to climatology and meteorology studies, measuring the UV effects on ecosystems, studies of plant responses to UV levels.

|                                   |                       |                     |
|-----------------------------------|-----------------------|---------------------|
| Working range, W/m <sup>2</sup> : | 0 to 100 (UVA Sensor) | 0 to 5 (UVB Sensor) |
| Operating range, °C:              | -30 to +60            |                     |
| Operating range, RH:              | 0 to 100%             |                     |
| Temperature coefficient, °C:      | ±0.2%                 |                     |
| Dimensions, mm:                   | 69 x 34               |                     |

| Catalogue No | Description   |
|--------------|---|
| AG52-350     | UVA Sensor with integral datalogger (datalogger specification on page 59) |
| AG52-352     | UVB Sensor with integral datalogger (datalogger specification on page 59) |





AG52-400



## PAR Quantum Measurements

A fully portable instrument designed to measure Photosynthetically Active Radiation (PAR), the light which falls between 400 and 700nm and which is used by plants for growth.

The instrument can provide an accurate prediction of the efficiency of photosynthetic activity in plant growth, and is particularly useful when used in fluctuating light environments such as plant canopies. Accurate measurements are made as a result of the filtering within the sensor, on light of any nature, sunlight, tungsten, fluorescent or xenon lamps etc.

In order for data retrieval and subsequent analysis to be undertaken, a datalogger is required. The datalogger shown here is a 1-channel dedicated and reliable system which is easy to use, robust, durable, and completely weatherproof with an ABS housing that is sealed to IP65. The Sensor and Digital Read-out units are also available for purchase as individual components.

- Measurement of the efficiency of photosynthetic activity on plant growth
- Use in outdoor or indoor applications
- Measurement procedure has become a standard in scientific papers worldwide
- Assessment of drift in radiation sources
- Comparison of Photosynthetic efficiencies of light sources differing in spectral emission

Digital Meter



AG52-206



|                    |                            |   |
|--------------------|----------------------------|---|
| <b>Sensor:</b>     | Sensitivity current:       | 2µA/100 µmol/m <sup>2</sup> /sec                  |
|                    | Sensitivity voltage:       | 1mV/100 µmol/m <sup>2</sup> /sec                  |
|                    | Working range:             | 0 to 5 x 10 <sup>4</sup> µmol/m <sup>2</sup> /sec |
|                    | Temperature range, °C:     | -35 to +75  |
|                    | Humidity range, RH:        | 0 to 100%   |
|                    | Sensor:                    | Cosine corrected head                             |
| Weight, g:         | 130                        |   |
| Dimensions, mm:    | 38 x 34                    |   |
| <b>Datalogger:</b> | Operating temperature, °C: | -20 to +70  |
|                    | Memory:                    | Battery packed RAM, 1Mbit, 4000 readings approx.  |
|                    | Communications:            | RS232 ASCII output will communicate with any PC   |
|                    | Power:                     | Standard 6x 'C' batteries (4 to 6 months approx.) |
|                    | Weight, g:                 | 1100  |
| Dimensions, mm:    | 105 x 122 x 120            |   |

| Catalogue No | Description  |
|--------------|--|
| AG52-400     | PAR Quantum Sensor with Integral Datalogger                          |
| AG52-402     | PAR Quantum Sensor and digital meter, with battery and carrying case |
| AG52-206     | Levelling unit for Sensor  |

### NOTE:

#### Light Measurement:

If you cannot find your exact requirements then please contact us.

We regularly supply a wide range of light measurement equipment in addition to that which is listed in this section.

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## Plant Canopy Measurement

A simple to operate instrument for measuring Photosynthetically Active Radiation (PAR) and Leaf Area Index (LAI), this linear PAR ceptometer consists of an integrated probe and microcontroller. The probe consists of 80 sensors that are sensitive to the PAR waveband, and the microcontroller allows for instantaneous visual read outs of PAR.

The unit has just 4 menus: PAR/LAI sampling, unattended logging, file access, and setup and the intuitive 6-key interface allows for quick and simple navigation.

The external PAR sensor (included) will allow for simultaneous PAR measurements above and below the canopy and the recordings are saved at the push of a button.



| Catalogue No | Description   |
|--------------|---|
| AG52-600     | PAR range, $\mu\text{mol m}^{-2}\text{s}^{-1}$ : 0 to >2500 |
|              | Operating environment, °C: 0 to 50                          |
|              | Number of sensors: 80                                       |
|              | Data storage capacity: 1MB RAM (over 2000 measurements)     |
|              | Data retrieval: Direct via RS232                            |
|              | Weight, kg: 1.21  |
|              | Overall length/ Probe length, mm: 990/ 840                  |
|              | Power: 4 x AA batteries                                     |

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# Weather Stations make a mark in Nigeria

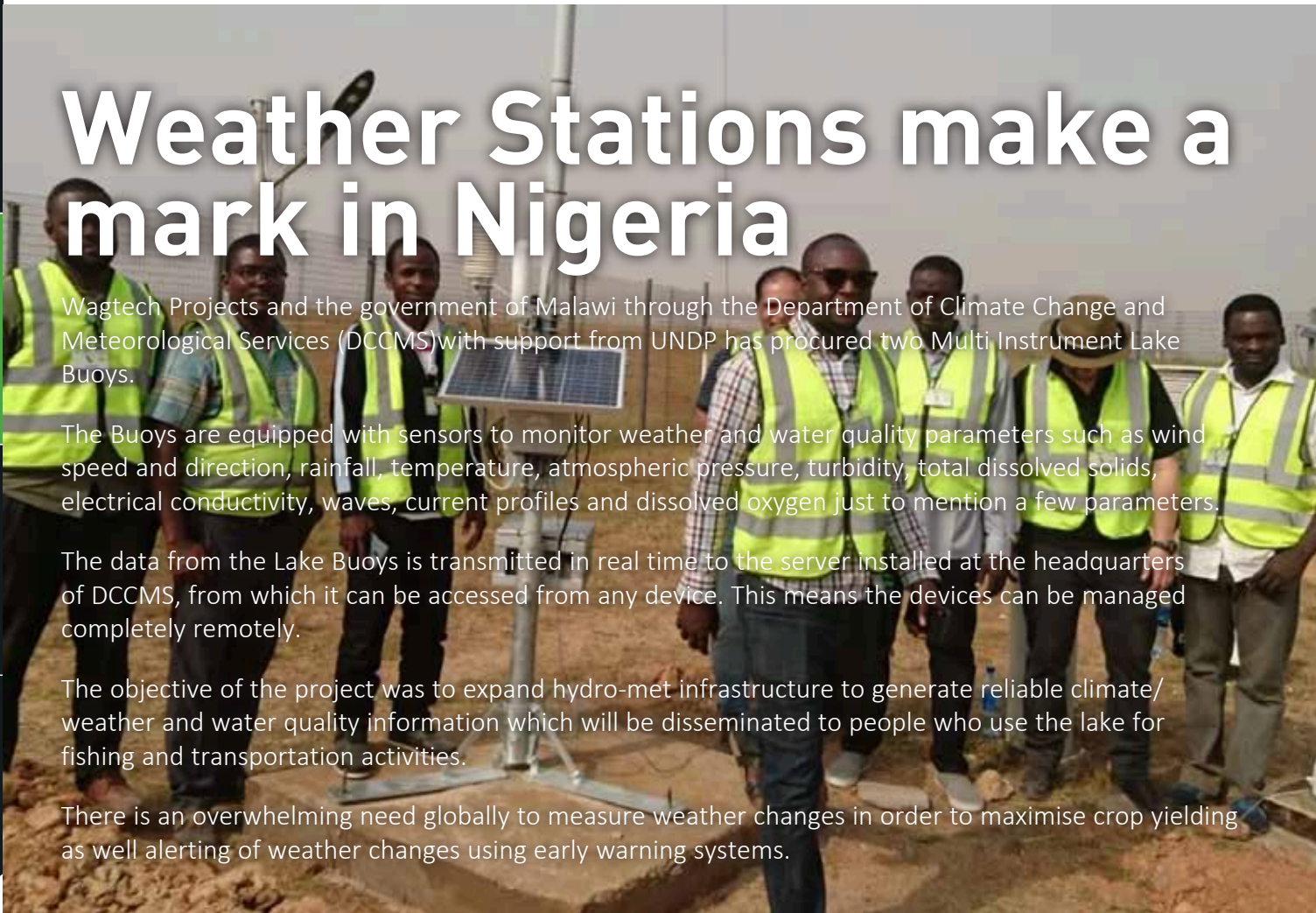
Wagtech Projects and the government of Malawi through the Department of Climate Change and Meteorological Services (DCCMS) with support from UNDP has procured two Multi Instrument Lake Buoys.

The Buoys are equipped with sensors to monitor weather and water quality parameters such as wind speed and direction, rainfall, temperature, atmospheric pressure, turbidity, total dissolved solids, electrical conductivity, waves, current profiles and dissolved oxygen just to mention a few parameters.

The data from the Lake Buoys is transmitted in real time to the server installed at the headquarters of DCCMS, from which it can be accessed from any device. This means the devices can be managed completely remotely.

The objective of the project was to expand hydro-met infrastructure to generate reliable climate/ weather and water quality information which will be disseminated to people who use the lake for fishing and transportation activities.

There is an overwhelming need globally to measure weather changes in order to maximise crop yielding as well alerting of weather changes using early warning systems.





# Forestry

Forestry is concerned with the establishment and management of forests for timber production, environmental conservation and amenity purposes, and in many regions is of major ecological, economic and social importance.

This section consists of a range of portable equipment for the monitoring and conservation of timber.

AG53-200

## Hypsometer

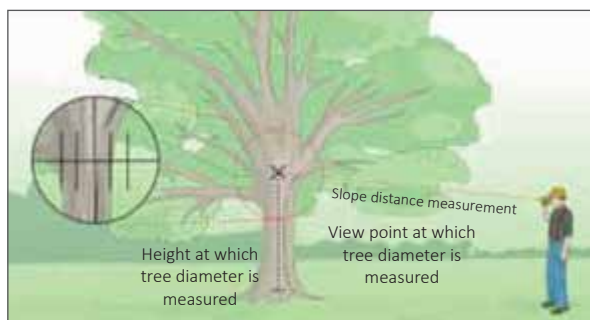


All-in-one height and diameter instrument.

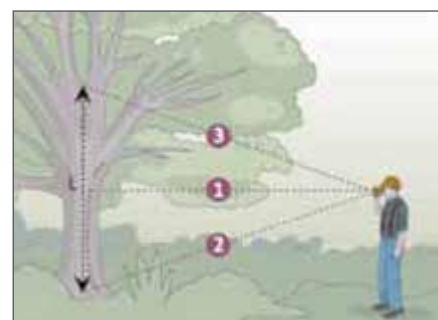
This lightweight, handheld hypsometer uses Class 1 eye safe laser technology to measure tree diameters at a touch of a button. Designed for one-person operation, you simply point and shoot. The unit measures a targets distance, elevation, height and diameter as well as slopes and gradients. The unique aiming and diameter scope easily allows you to take remote measurements, and an electronic brush filter ensures accurate measurements to prism targets in areas of scrub or undergrowth.

The unit features an onboard multifunction computer which stores results (up to 2,000 trees) for later viewing or downloading to a PC or PDA using the Bluetooth (or RS 232) data link. Water and dust resistant to IP67.

| Catalogue No | Description  |
|--------------|--|
| AG53-200     | Distance: Accuracy, $\pm 8''$ ( $\pm 0.2m$ ) to high-quality targets; $\pm 1$ yd. ( $\pm 1m$ ) to low-quality targets. |
|              | Resolution: 0.5' (0.1m).   |
|              | Range: 0 to 3,280' (1,000m) typical, 6,560' (2,000m) maximum to reflective target.                                     |
|              | Inclination: Accuracy, $\pm 0.25^\circ$ ; Range, $\pm 90^\circ$ .  |
|              | Magnification: 7x. Field of view: 33' at 330'.   |
|              | Eye safety: FDA Class I (CFR 21).  |
|              | Compass range: 0 to 359.9°.  |
|              | Compass accuracy: $<0.5^\circ$ RMS.  |
|              | Communication: Bluetooth and serial, via wired RS 232.   |
|              | Operating temperature: -4°F to 140°F (-20°C to 60°C).  |
|              | Power: 1 CR123A.   |
|              | Battery Life: 8 hours.   |
|              | Dimensions: 5" x 2" x 4.5".  |
|              | Weight: 13.5 oz.   |



Measure Diameters



Measure height, lean and volume

General Survey

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## Wood Moisture Meter

An advanced yet simple to use moisture meter specifically designed for the timber industry. This device is ideal for a range of quality control applications associated with the production, trading and use of wood products.

This compact instrument has eight calibration scales, enabling the user to take accurate moisture measurements in 150 wood species.

With a variety of package options available, this is the complete wood moisture measurement system.

- All readings are displayed on a large LCD display
- May be used with optional hammer electrode for sub-surface measurements
- Built in wood calibration scales
- Automatic temperature correction (with temperature probe)
- Durable and rugged design
- Hand held, fully portable device

| Catalogue No | Description  |
|--------------|--|
| AG53-100     | Plus package comprising of a wood moisture meter, temperature probe, heavy duty two pin moisture probe, WME calibration check, carrying case and wood calibration chart and instructions |
| AG53-102     | Standard package comprising of a wood moisture meter, heavy duty moisture probe, wood calibration chart and instructions, WME calibration check and a carrying case                      |

AG53-100



## Electronic Dendrometer

An electronic and fully portable basal area/dendrometer that accurately and instantaneously measures tree diameters. Utilising the integrated tilt sensor, diameter data can be collected at any point up the stem and the height at which a specific diameter is reached is also displayed. The Basal Area Factor (BAF) routine will show 'In and Out' trees for a wide range of sampling factors.

- Fully portable unit offering exceptionally accurate and quick results
- Borderline trees are easily resolved by entering distance into keypad
- In-scope LED offers variable brightness levels, making it easy to ready under diverse lighting conditions

| Catalogue No | Description  |
|--------------|--|
| AG53-150     | Range: Diameter, mm: 50 to 2500                      |
|              | Basal Area Factor, M <sup>2</sup> /HECT: 0.2 to 39   |
|              | Inclination, degrees: ± 90                           |
|              | Accuracy: Diameter, mm: ± 6 up to 24m                |
|              | Inclination, degrees: ± 0.1 (typical)                |
|              | Temperature, °C: -30 to +60                          |
|              | Display: External LCD and Internal LED               |
|              | Environmental: Water & dust resistant, NEMA 3, IP 54 |
|              | Power: 2 x AA batteries                              |
|              | Weight, g: 500                                       |
|              | Dimensions, mm: 70 x 50 x 165                        |

AG53-150







AG53-302



### Tree Callipers

Features high-strength injection-moulded plastic brackets that are stronger than aluminium brackets. Eliminates loose rivets and wear that could produce inaccurate measurements. These heavy-duty callipers give accurate diameter measurements up to 1.27m. Easy-sliding, adjustable measuring jaws. Beams graduated on both sides. Graduated in cm and mm on either side.

| Catalogue No | Length, mm |
|--------------|------------|
| AG53-302     | 400        |
| AG53-304     | 500        |
| AG53-306     | 650        |
| AG53-308     | 800        |
| AG53-310     | 950        |
| AG53-312     | 1020       |
| AG53-314     | 1270       |

AG53-350



### Increment Borers

Used to extract cores of wood from trees or freshly treated poles, piling, lumber, or timbers in order to determine growth rate, age, tree soundness, and chemical penetration.

Teflon coating protects bit against rust and resin build-up and also reduces friction. Hardened rubber cap is forged with extractor so it will not work loose. Increment borer use and care booklet included.

Those illustrated below are constructed with a 5.15mm core and with 3 threads. Other sizes, both core sizes and lengths are available upon request.

| Catalogue No | Bit Length, mm |
|--------------|----------------|
| AG53-350     | 150            |
| AG53-352     | 200            |
| AG53-353     | 250            |
| AG53-354     | 300            |
| AG53-356     | 400            |

AG53-400



### Bark Thickness Gauge

Bark Thickness Measurer, to determine thickness from 0 to 50 mm or 0" to 2" in increments of 1mm or 0.1". Measures the bark thickness by driving the cutting edge through bark until the wood is reached. The cutting steel is protected inside the plastic handle when not in use.

| Catalogue No | Description                   |
|--------------|-------------------------------|
| AG53-400     | Measures to 50mm in 1mm units |

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# Single Source Solution...

Wagtech Projects can offer advice and guidance on a wide range of equipment used in agricultural research. Our in-house experts are always available to help you select the correct product either from that which is listed in the catalogue or by suggesting suitable alternatives.





# Seed Technology

**Seed Technology:** The ISTA rules for seed testing, published in Seed Science and Technology constitute the methods which must be used for the issuance of ISTA certificates by accredited Seed Testing Laboratories. Wagtech has taken care to manufacture and supply equipment suitable for independent seed testing laboratories around the world for applications such as physical, biological and cultivator purity, incidence of noxious weed seeds, germination percentage, moisture and content etc.

**Sampling and Uniformity:** A defined procedure whereby a representative part of a seed lot is taken for submission to a seed testing laboratory. Before sampling a seed lot, it is important to first ensure that the lot is uniform.

The quality of seed tested in the laboratory is minute in comparison to the size of the seed lot that it is intended to represent. To obtain uniform and accurate results it is essential that the primary, composite and submitted samples be taken from the seed lot and prepared according to methods agreed internationally, and to ensure that the sample tested in the laboratory accurately represents the composition of the seed lot in question. Likewise, in reducing the sample in the laboratory, every effort must be made to obtain a working sample that is representative of the sample submitted for testing.

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AG61-050

## Heavy Duty Boerner Divider

A required piece of equipment for obtaining a truly representative sample, is standard equipment in most seed testing laboratories and is made to meet ISTA specifications.

To operate the device, a sample of grain is placed in the hopper and then released down a cone which is directly under the centre of the opening. Around the base of the cone are 38 openings or pockets. The divider is calibrated to provide accuracy of 1% between pans on a 1000g sample.

- Constructed of brass and copper only, eliminating any possibility of rust
- Entire bottom section is removable to facilitate cleaning if necessary
- Legs and supports are brass plated steel, and the unit comes complete with two pans
- Dimensions, cm 50x 50 x 97
- Weight 16kg



| Catalogue No | Description                |
|--------------|----------------------------|
| AG61-050     | Heavy Duty Boerner Divider |



## Spear Samplers

AG61-100

A comprehensive range of spears and tries are available as listed. A wide range of alternative sizes (length and aperture) are also available on request.

- Bag and bulk cargo varieties to suit most materials; corn, wheat, barley, coffee etc
- Protective cover for when not in use
- Provides years of trouble-free service



### Sack Spear Samplers (single slot)

Consisting of a rust proof, single-slotted tube, this device permits easy sampling of sack-stored seeds. A sample is obtained by spearing the sack horizontally with the slot facing downwards; at the desired position the spear is turned leaving the slot uppermost. Grain then falls into the spear and is allowed to exit from the open-end of the spear by tilting it slightly downwards.

| Catalogue No | Description   |
|--------------|---|
| AG61-100     | Sack spear sampler, 12.7mm diameter, 650mm long         |
| AG61-101     | Sack spear sampler, 15mm diameter, 650mm long           |
| AG61-102     | Sack spear sampler, 19mm diameter, 650mm long           |
| AG61-104     | Sack spear sampler, 22mm diameter, 650mm long           |
| AG61-106     | Spear Samplers, Alloy, 1m long x 32mm dia, single slot  |
| AG61-108     | Spear Samplers, double concentric, 1.5m, 3 slots, Alloy |
| AG61-110     | Spear Samplers, Alloy, double concentric, 2m, 3 slots   |
| AG61-112     | Spear Samplers, Alloy, double concentric, 2m, 5 slots   |

### Sack Spear Samplers (double concentric)

Consisting of accurately fitting inner and outer tubes which may be separated for easy cleaning, these sampling spears are designed for vertical insertion into sack, bin and floor-stored grain.

The inner tube is rotated to close when inserting and withdrawing, and is further rotated to collect and recover the sample. The multi-slot spear has the advantage of extracting discrete grain samples over a range of depths, thus ensuring a representative sample for further testing.

## Centrifugal Seed Divider

AG61-250

This is a traditionally designed precision divider that has repeatedly demonstrated its ability to precisely divide large samples of seed, grain and feed into working size samples in a matter of seconds.

The dividing and mixing are accomplished by the centrifugal action of a motor driven revolving neoprene disc positioned under the hopper. A smooth inside chrome plated finish virtually eliminates any of the sample sticking to the inner surfaces. Both the hopper and cylinder top lift off to provide easy access to the interior of the dividing chamber.

The unit consists of a stainless steel hopper over 102mm diameter spinner above spiral fluted, cast bronze, two-way dividing head. The spinner is driven at 450rpm by 50W geared motor unit housed in base. Detachable hopper for access to the spinner and two-way dividing head; the divider is fitted with an off bias push button switch. The unit comes with a transformer for use with 220V AC 50Hz.

| Catalogue No | Description                             |
|--------------|---|
| AG61-250     | Weight. Kg: 23                          |
|              | Dimensions (wxdxh), mm: 343 x 324 x 534 |



## Accessories

| Catalogue No | Description                        |
|--------------|------------------------------------|
| AG61-252     | Stainless Steel Collection Pans x2 |



AG61-300



## Mechanical Seed Divider (Riffle Box)

These sample dividers provide duplicate samples which ensure representative test results. Material poured into the hopper is divided into two equal portions by two series of chutes which discharge alternately in the opposite direction into separate pans. Painted or stainless steel construction, and supplied with two collecting pans. They are available in different sizes for splitting a range of sample quantities.

| Catalogue No | Description     | Chute Width, mm | Chute No. | Weight, kg |
|--------------|-----------------|-----------------|-----------|------------|
| AG61-300     | Stainless steel | 7.0             | 12        | 2          |
| AG61-302     | Stainless steel | 12.7            | 12        | 9.1        |
| AG61-304     | Steel           | 20              | 10        | 9          |
| AG61-306     | Steel           | 25              | 10        | 12         |
| AG61-308     | Steel           | 40              | 8         | 21         |
| AG61-310     | Steel           | 50              | 8         | 27.5       |
| AG61-312     | Steel           | 65              | 8         | 27.5       |

AG61-400



## Vacuum Sampler

This enables samples to be taken from deep bulk stores or lorry trailers. A maximum depth of eight metres can be sampled and all components are housed in a carrying bag.

The unit comprises of a 3000W industrial vacuum cleaner which has a removable drop bin with a capacity of 60 litres mounted on castors, and 3 self cooling motors suitable for 220-240V, 1pH, 50Hz (110V available on request).

| Catalogue No | Description    |
|--------------|----------------|
| AG61-400     | Vacuum Sampler |

### Accessories

| Catalogue No | Description                             |
|--------------|---|
| AG61-402     | Vacuum probe set, 6 x 1m plastic probes |
| AG61-404     | Plastic probes, 1m length               |

AG61-510



## Seed Blower

Precision built laboratory instrument designed for sorting and removing inert matter from a variety of seeds.

The blower is equipped with a synchronous motor to ensure uniform RPM and therefore consistent test results. Air flow is regulated with a calibrated vernier gate and adjusted with a calibrated hand wheel for precise adjustments that can be easily repeated.

The unit is supplied with a large tube kit as standard.

| Catalogue No | Description                     |
|--------------|---------------------------------|
| AG61-510     | Power: 220V 50/60Hz             |
|              | Weight, kg: 32                  |
|              | Dimensions, mm: 580 x 560 x 460 |

### Accessories

| Catalogue No | Description          |
|--------------|----------------------|
| AG61-512     | Spare Large Tube Kit |



## Seed Sorting Machine

This seed blower serves for quick and easy separation of light and heavy seed. The seed is filled into a drawer of the acrylic glass cylinder. A fine meshed sieve closes the upper end of the cylinder. A speed controlled blower in the cylinder generates a constant upward air column.

Depending on its size and weight, the seed will fall into one of the 3 collecting vessels being installed at the cylinder. The light seed will be deposited in the upper collecting vessel, whereas the heavy seed will be deposited in the lower collecting vessel. A further sieve at the bottom of the cylinder avoids penetration of seed into the blower.

After disconnection of the blower, the sieve contains also the deposit, consisting of the residues and eventually of small stones. The collecting vessels are equipped with a snap buckle clip allowing easy removal.

For 220-240V 1ph, 50Hz (110V available on request).

| Catalogue No | Description          |
|--------------|----------------------|
| AG61-600     | Seed Sorting Machine |
| AG61-602     | Spare Cylinder       |

## Diaphanoscope (Seed Viewer)

Designed for testing the purity of seed samples with maximum comfort and efficiency. Light below the rectangular 200mm x 120mm glass shines up through the seed to determine if the embryo is alive. A convenient drawer is provided in the front for larger seed lots.

The unit is constructed of seasoned hard wood with a varnish coating. Supplied with a magnifying glass plus one spare light bulb.

| Catalogue No | Description                                   |
|--------------|---|
| AG61-700     | Drawer capacity, cubic cm: 930 approximately  |
|              | Power: 220 to 240V (110 available on request) |
|              | Dimensions, mm: 500 x 280 x 100               |

AG61-600



AG61-700



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# Moisture Content

**Moisture Content:** Samples for moisture content tests should only be accepted if they are submitted in an intact moisture proof container from which as much air as possible has been excluded.

Most customers submit their samples in 250 gauge polythene bags that are either tied or closed with elastic bands. Neither of these methods of sealing provides a proper seal, which could be accomplished using a Wagtech heat-sealer. Where a heat sealer is not available it is recommended that the seed testing lab obtain a supply of heavy duty polyethylene bottles with screw top seals.

AG62-100



## Programmable Moisture Analyser

A market-leading instrument for the measurement of moisture content within agricultural commodities. This analyser simultaneously senses capacitance, weight and temperature of the sample being tested, providing a corrected moisture (%) reading in a few seconds on the liquid crystal display.

The technology allows the use of whole grains with no need to grind the sample. Cereals, oil seeds, pulses etc, can be loaded directly into the measurement cell without any sample preparation.

The average moisture content of a series of up to 254 samples can be measured in one second. Readouts of temperature and Hectolitre (bushel) weight can be displayed and the RS232 printer output allows information to be fed to a computer for hard copy record and/or printing.

Up to 7 calibration programmes can be held in the memory and these can be individually adjusted in order to optimise the accuracy. Please specify the type of crop you wish to analyse when ordering.

- Accurate - standard deviation of 0.03
- Fast - 6 second analysis
- Easy - no need to grind the sample
- Robust and portable - strong, thick polyurethane construction weighs under 2kg

| Catalogue No    | Description   |
|-----------------|---|
| <b>AG62-100</b> | Measurement range, %: 1-35 moisture, wet basis (depending on application)     |
|                 | Accuracy: Typical standard deviation 0.03 for moisture, 1.0 Hectolitre weight |
|                 | Operating environment, °C:0 to +55  |
|                 | Power supply:Four C size 1.5V alkaline batteries                              |
|                 | Weight, kg:1.8  |
|                 | Dimensions, mm:325 x 164 x 120  |

## Accessories

| Catalogue No    | Description  |
|-----------------|--|
| <b>AG62-102</b> | Portable printer, for use with the Moisture Analyser |



## Moisture probes

Time, effort and money are saved with this moisture probe, allowing for the moisture and temperature of hundreds of tons of crops to be tested within seconds.

The device represents a practical and efficient solution in the determination of both moisture content and temperature of bulk and bagged foodstuffs by insertion at a depth of up to 2m. The requirement for time costly laboratory analysis is eliminated as the probe can simply be inserted into the load of a truck, or used anywhere where commodities or foodstuffs are being stored. Results are displayed instantaneously on a large digital display without the need for any sample preparation. Multiple readings can be obtained within seconds, providing a truly accurate representative of the whole.

| Catalogue No | Description  |
|--------------|--|
| AG62-200     | Range: Moisture: 0 to 35% Temperature: -20 to 60°C   |
|              | Resolution: Moisture: 0.1% Temperature: 0.1°C  |
|              | Accuracy: Moisture: Better than 0.5% over a given range<br>Temperature: Better than 0.5°C  |
|              | Measurement Principles: Moisture: Temperature compensated electric field strength<br>Temperature: BS 1904/DIN 751 Platinum Resistance Detector |
|              | Power: 4 x 1.5 V AA cells or DC supply   |

| Catalogue No | Description  |
|--------------|--|
| AG62-202     | Grain Moisture & Temp Probe for bulk samples (2m shaft length) |
| AG62-204     | Grain Moisture Analyser for bagged samples 1m shaft length     |

## Large Seed Moisture Analyser

Large Seed Moisture Analyser is the ideal solution for measuring moisture and temperature in large seeds. It's unique sensor technology allows easy measurement of moisture in large particles without grinding or processing in any way. This makes it ideal for measuring: cocoa beans, palm oil kernels, animal feeds or virtually any other granulated material.

| Catalogue No   | Description   |
|--|---|
| AG62-210   | Accuracy: Better than +/-0.5% mc dependant upon application |
|  | Measurement range: 0%- 35% dependant upon application       |
|  | Operating Environment: 20 – 60 °C                           |
|  | Power Supply: 4x1.5v AA Cells                               |
|  | Principle of Operation: Capacitance                         |
|  | Temperature Compensation: Automatic, programmable           |
|  | Readout resolution: 0.1% mc ,0.1 °C                         |
| Dimensions (display unit/ sensor): 195 x 154 x 33 mm, 0.6 kg/ 100 x 380 mm, 1.5 kg |   |
|  | Sensor volume: 1.4 litres                                   |

## Special Bin Thermometer

A Thermometer that is specifically designed for recording grain temperatures within bins. A 210mm solid brass cover encases a 130mm glass spirit filled thermometer that is protected by a plastic cover. Three temperature ranges are available. The unit attaches to a standard 900mm extension and T-Handles (Accessories). Weight 453g, Dimensions 300 x 230 x 130 mm.

| Catalogue No | Description   |
|--------------|---|
| AG62-300     | Special Bin Thermometer, -0-120°F, 1° divisions               |
| AG62-304     | Dual Range Bin Thermometer, -10-110°C / 0-220°F, 1° divisions |

## Accessories

| Catalogue No | Description     |
|--------------|-----------------|
| AG62-306     | T-Handle        |
| AG62-308     | 900mm Extension |

AG62-200



AG62-204



AG62-210



AG62-300







AG62-350



## Moisture Balances

### MB23

- Moisture determination from 50°C to 160°C, 5°C increments, repeatability 0.2% (10g sample), compact design, infrared heating, manual, automatic or timed duration drying time
- Display- Custom backlit LCD
- Mains power operation
- RS232 Interface communication
- Durable ABS construction, in-use cover, sample pan holder

### MB25

- Moisture determination from 50°C to 160°C, 5°C increments, repeatability 0.05% (10g sample), compact design, halogen heating, manual, automatic or timed duration drying time
- Display- Custom backlit LCD
- Mains power operation
- RS232 Interface communication
- Durable ABS construction, in-use cover, sample pan holder

| Catalogue No | Model No | Capacity, g | Readability    | Platform size, mm |
|--------------|----------|-------------|----------------|-------------------|
| AG62-350     | MB23     | 110         | 0.01g/ 0.1%    | 90                |
| AG62-352     | MB25     | 110         | 0.005g/ /0.05% | 90                |

AG62-400



## Moisture/Temperature Analyser

This is a highly versatile instrument to measure the moisture and temperature of crops. The meter is pre-programmed with 16 crop calibrations, each of which can be adjusted individually.

In addition to the 0-100 relative scale, the 16 pre-programmed calibrations include: Wheat, Barley, Oats, Oilseed Rape, Canola, Linseed, Peas, Corn, Sunflower, Coffee, Soya, Rice, Sorghum, Paddy and Beans.

It is supplied with an integrated grinder-compressor unit that enables the user to take moisture readings in ground samples very quickly and simply. There is also a range of optional probes for measuring temperature in stored grain (AG62-402) and moisture levels in baled hay and straw (AG62-406). Power 9V Battery.

Table: % Moisture Measurement Range

|                     |                       |                    |                      |
|---------------------|-----------------------|--------------------|----------------------|
| Wheat:11.3 to 29.3  | Canola:7.0 to 26.0    | Coffee:9.8 to 23.9 | Rice 13.2 to 26.5    |
| Oats:10.9 to 29.3   | Linseed:7.0 to 16.5   | Soya:7.4 to 22.2   | Sorghum:10.2 to 26.9 |
| OSR:7.0 to 26.0     | Sunflower:6.2 to 23.0 | Beans:12.4 to 25.0 | Paddy:10.4 to 26.2   |
| Barley:10.9 to 29.3 | Corn:10.4 to 26.2     | Peas:12.0 to 30.9  | 0-100 relative       |

Note: Not all calibrations are for ground samples

| Catalogue No | Description  |
|--------------|--|
| AG62-400     | Moisture/Temperature Analyser, supplied in a pouch with grinder-compressor unit, grain cup, sample spoon, and brush. |

## Accessories

| Catalogue No | Description   |
|--------------|---|
| AG62-402     | Fast Response Temperature Probe, length 1m  |
| AG62-404     | Grinder blade and plastic feeder ring. Replacement parts for the Grinder Compressor |
| AG62-406     | Hay and Straw Bale Moisture Probe 600mm length for use with AG62-400 Moisture Meter |

AG62-402





## Hay & Straw Bale Moisture Meter

The Digital Hay & Straw Bale Moisture Meter is a hand held instrument which displays the results on a large LCD Digital Display. This digital moisture meter is a complete moisture measurement system for assessing RH content in the bales of straw and hay. It is a feature packed agriculture moisture meter. Supplied with a probe which is made from strong durable stainless steel and is 600mm long to reach the centre of large bales. Measurement range: 9% - 40%

| Catalogue No | Description                       |
|--------------|-----------------------------------|
| AG62-410     | Hay and Straw Bale Moisture Meter |



AG62-410

## Powder Moisture Meter

Used to measure moisture content of powder and granules such as powdered milk, corn starch, white sugar, brown sugar and coffee. Uses a high-frequency principle, digital display, rapid measurement, stable performance, reliable indicators. The meter is compact and lightweight meaning it becomes easy to transport and provides rapid on-site testing.

| Catalogue Number | Description                                 |
|------------------|---|
| AG62-420         | Moisture range: 0 to 80%                    |
|                  | Accuracy: +/-0.2% (0-10%), +/-0.5% (10-40%) |
|                  | Resolution: 0.1%                            |
|                  | Display: LCD digital display                |
|                  | Probe length: 200mm                         |
|                  | Response time: 1 second                     |
|                  | Temperature: -10°C to 50°C                  |
|                  | Dimensions, mm: 160 x 60 x 27               |
|                  | Power supply: 9V battery                    |
|                  | Weight, kg: 0.2                             |



AG62-420

## Flour Moisture Meter

This compact and portable meter quickly and accurately measures moisture content of wheat flour, potato flour and yeast powder.

Features include:

- Easy to use, quick to read and compact
- User-friendly interface
- Stable performance and excellent build quality
- Compact design

| Catalogue Number | Description                        |
|------------------|------------------------------------|
| AG62-430         | Moisture range: 0 to 80%           |
|                  | Operating temperature:-5°C to 50°C |
|                  | Display: LCD digital display       |
|                  | Resolution: 0.1%                   |
|                  | Power supply: 9V battery           |
|                  | Dimensions, mm: 160 x 60 x 27      |
|                  | Weight, kg: 0.3                    |



AG62-430



AG62-500



## Whole Grain Analyser

A powerful near-infrared, full spectrum spectrophotometer that is specially designed for use by farmers as a tool to enhance the management of crop production and harvesting.

Capable of measuring protein, oil and moisture in cereal grains and oil seeds, this simple to operate, rugged and portable instrument allows the farmer to measure their crops in the field, on the header or in the farm.

- Broad spectral range
- Multiple constituent analysis
- Optimum calibration development PLS calibrations
- 1st and 2nd derivative spectral data
- Qualitative and quantitative data
- No moving parts - good for transportation and use in the field
- Internal computer - saves calibrations and results, and predicts constituents onto a LCD
- RS323 Serial Port - allows for convenient uploading of data to a PC or to download calibrations to the instrument
- Tough and durable case

AG62-600



| Catalogue No    | Description  |
|-----------------|--|
| <b>AG62-500</b> | Scan range, nm: 720 to 1100  |
|                 | Pixels: 38   |
|                 | Scan speed, seconds: 2 to 4  |
|                 | Power: 19V DC via mains adapter 110/240V   |
|                 | Dimensions, mm: 390 x 270 x 220  |
|                 | 4 sample cells: 5mm Powder Cell-powders, films and textiles<br>10mm Squeeze Cell-creams, ointments and lotions<br>10mm Liquid Cell-liquids<br>18mm Granular Cell-pellets and beads |

## Micro Hammer Cutter Mill

A Cutter Mill for pulverising a large variety of materials up to 6mm in size.

This instrument is both easy to use and suitable for almost any small scale dry grinding or milling applications within the laboratory.

- Integrated overheating, overload and blocking protection
- Interchangeable grinding chambers and blades for either hammer or cutting mill configurations
- Safety switch and push button overload circuit-breaker
- Integrated speed control with LED display
- Interchangeable sieves with mesh sizes from 0.2 to 6mm orifice

| Catalogue No    | Description  |
|-----------------|--|
| <b>AG62-600</b> | Funnel or working volume: Approximately 300ml      |
|                 | Speed range: 50 to 6,000 rpm                       |
|                 | 0-40°C, up to 80% relative humidity                |
|                 | Motor: power 1000 watt                             |
|                 | Noise output: < 70 dB(A) at 6,000 rpm with no load |
|                 | Voltage: Single phase 230V, 50Hz or 115V, 60 Hz    |
|                 | Weight: 12kg                                       |
|                 | Dimensions (WxDxH), mm: 251 x 325 x 480            |

## Accessories

A comprehensive range of additional sieves are available for use with the Micro Hammer Cutter Mill. The sieves are manufactured in either Nickel or Stainless Steel.

| Catalogue No    | Description  | Catalogue No    | Description  |
|-----------------|--------------|-----------------|--------------|
| <b>AG62-602</b> | Sieve 0.2mm  | <b>AG62-612</b> | Sieve 2.00mm |
| <b>AG62-604</b> | Sieve 0.5mm  | <b>AG62-614</b> | Sieve 3.00mm |
| <b>AG62-606</b> | Sieve 0.8mm  | <b>AG62-616</b> | Sieve 4.00mm |
| <b>AG62-608</b> | Sieve 1.00mm | <b>AG62-618</b> | Sieve 5.00mm |
| <b>AG62-610</b> | Sieve 1.50mm | <b>AG62-620</b> | Sieve 6.00mm |



## Laboratory Mill

A disc type laboratory mill that is used for grinding grains, peas, corns, soybeans and other similar matter without any moisture loss. The sample is rapidly crushed/sheared between sharp steel discs and collected in a quick release plastic sample cup. The disc design and the rapid grinding minimize heat development. Loss of water is virtually eliminated. Typical sample size is 5-50g for general applications and 10-15g for grain moisture determinations.

The mill is supplied with a standard grinding disc (medium 4x3 teeth). A further range of discs are available in the Accessories box below.

- Large inlet allows grinding of pellets and large sized grain
- Grinds up to 250 gram sample
- Sample preparation for accurate moisture analysis
- Particle size distribution is easily adjusted by changing distance between discs
- Reliable operation and long mill life
- Low noise motor

| Catalogue No    | Description                             |
|-----------------|---|
| <b>AG62-700</b> | Operation: Direct drive                 |
|                 | Capacity: 50g in 10-15 seconds          |
|                 | Dimensions, (hxdx), mm: 440 x 550 x 260 |
|                 | Disc diameter, mm: 75                   |
|                 | Noise output, DB: 100                   |
|                 | Power: 115 or 230 V, 50 or 60 Hz        |
|                 | Net weight, kg: 33                      |

### Accessories

| Catalogue No    | Description  |
|-----------------|--|
| <b>AG62-702</b> | Medium Grinding Disc: Used for determination of moisture content. Supplied as standard with AG62-700 |
| <b>AG62-704</b> | Fine Grinding Disc: Used for Particle Size Index (PSI) or when a fine particle size is required      |
| <b>AG62-706</b> | Coarse Grind Disc: Used for oats and other high moisture grains                                      |

## Grinding Mill, Analytical

Batch mill that can be used for impact grinding of hard, brittle or non-elastic grinding materials with the use of the high-grade stainless steel beater, or for pulverising soft fibrous materials with an accessory cutting blade.

- Stainless steel beater can be used for a Mohs hardness up to 6
- Grinding chamber is constructed of reinforced glass fibre with stainless steel inlet, useful with volumes up to 80ml
- Electronic overload protection and overheat safety switch

| Catalogue No    | Description                                    |
|-----------------|--|
| <b>AG62-800</b> | Speed, rpm: 28000                              |
|                 | Overload protection: Electronic                |
|                 | Useful volume, ml: 80                          |
|                 | Permissible ambient temperature, °C: 5 to 40   |
|                 | Permissible humidity, %: 80                    |
|                 | Dimensions, mm/ Weight, kg: 85 x 85 x 240/ 1.5 |
|                 | Power: 220/ 240V AC 50Hz                       |

### Accessories

| Catalogue No    | Description            |
|-----------------|------------------------|
| <b>AG62-802</b> | Cutting Blade          |
| <b>AG62-804</b> | Grinding Chamber 250ml |

AG62-700



AG62-800





AG62-900



## Seed and Grain Dryer

A laboratory based seed and grain dryer that is designed to combine flexibility, efficiency and ease of testing application. It is used to dry laboratory samples of grain and seed since this is required to estimate hulling and recovery of different kinds of grain. The drying time will vary according to the variety and type of grain to be tested, as well as its initial contained humidity. The power supply is 220V 50/60Hz as standard, although 110V is also available.

Choosing the right size of the sample tray will depend on many variables. A selection of sizes is available; 50mm tall, 150mm tall or 200mm tall, with volumes of 14090mm<sup>3</sup> (86 Cu.In), 28670mm<sup>3</sup> (175 Cu.In), and 57680mm<sup>3</sup> (352 Cu.In) respectively. Sample trays are sold separately. Four samples can be dried at the same time.

- The ideal device to reduce the humidity of the sample to optimise test level
- Energy efficient two-speed centrifugal fan
- Capacitor and auto thermal protection
- Digital control box with high temperature limit protection, real time temperature and targeted temperature

| Catalogue No    | Description   |
|-----------------|---|
| <b>AG62-900</b> | Materials: Body, heater assembly and most fasteners made in stainless steel. Fan made in carbon steel, paint finished. Covers and trays constructed in stainless steel. |
|                 | Power: 230V single phase, 60/50Hz (110V also available)   |
|                 | Weight, kg: 131   |
|                 | Dimensions, mm: 762 x 1016 x 1117   |

## Accessories

| Catalogue No    | Description                             |
|-----------------|---|
| <b>AG62-902</b> | Brass sieve: 200mm diameter, 50mm tall  |
| <b>AG62-904</b> | Brass sieve: 200mm diameter, 150mm tall |
| <b>AG62-906</b> | Brass sieve: 200mm diameter, 200mm tall |
| <b>AG62-908</b> | Caster Wheels: set of 4 wheels          |





# Germination

Before carrying out the germination test it is essential to ensure suitable germination substrates are available as specified by ISTA i.e sand, paper towels, filter paper, soil/compost etc.

Adequate stock should always be ordered and a full listing is highlighted within the General Lab Catalogue.

## Plant Growth Chamber

AG63-100

The Climatic Test Chamber has been recognized as an exceptional unit suitable for a wide range of applications. The wide variety of temperatures, humidity and lighting patterns that are essential in research, environmental studies and testing can now be accurately reproduced and controlled. The microprocessor P.I.D. and refrigeration capacity control minimizes temperature fluctuations and thereby improves temperature control. This allows precise experiments plus energy and electricity savings. Programming of temperature, light, and humidity can be used for small plants, environmental tests, algae, drosophila, etc. Easy calibration of temperature and humidity can be calibrated easily through the control panel. Small lightweight, high molecular membrane-type humidity sensor also boasts a high degree of accuracy and reproducibility. Graphic LCD panel with pop-up menu function on control panel provides visual display of operation and allows intuitive operation.



AG63-100

Benefits:

- Microprocessor P.I.D. controls temperature and humidity to create the optimum environments for various applications.
- Programmable temperature (0°C to 50°C), lighting 0 to 20.000 lux) and humidity function (55-90% RH) (MLR-351H only).
- Easy calibration through controller.
- Small lightweight, high molecular membrane-type humidity sensor.
- Programmable Temperature Function can operate 12 step programs.
- Automatic Data Logging of Operational Data of approximately two weeks (6 minute intervals) can be automatically recorded.



| Catalogue No    | Description  |
|-----------------|--|
| <b>AG63-100</b> | Internal Dimensions: 760x700x1835mm  |
|                 | Internal Dimensions: 520 x 490 x 1135mm  |
|                 | Net Weight: 226kg  |
|                 | Volume: 294 Litres   |
|                 | Temp control range 0~ +50 (lamp off) +0.3 degrees Celsius<br>+10: ~ +50 (lamp on) +0.3 degrees Celsius |
|                 | Temp Uniformity: +1 degree Celsius (lamp off) +2.5 degree Celsius (lamp on)                            |
|                 | Light control Programmable 0 ~ 20000:  |
|                 | Display: LCD   |
|                 | Max. Load Per Shelf 25 kg:   |
|                 | Power Supply Local:  |
|                 | Noise Level: 29 dB   |

|             |  |
|-------------|--|
| MAJI-RHOD   | Rhodamine                                    |
| MAJI-REFOIL | Refined Oil                                  |
| MAJI-AMM    | Ammonium (and Ammonia where pH is available) |
| MAJI-CAL    | Calcium                                      |
| MAJI-CHL    | Chloride                                     |
| MAJI-FLU    | Fluoride                                     |
| MAJI-NIT    | Nitrate                                      |
| MAJI-RHOD   | Rhodamine                                    |
| MAJI-REFOIL | Refined Oil                                  |
| MAJI-AMM    | Ammonium (and Ammonia where pH is available) |
| MAJI-CAL    | Calcium                                      |
| MAJI-CHL    | Chloride                                     |
| MAJI-FLU    | Fluoride                                     |
| MAJI-NIT    | Nitrate                                      |

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AG63-200



## Temperature Gradient Plate

The Wagtech Gradient Plate is a highly efficient, bi-directional temperature gradient system for investigating responses to temperature of various seeds. Analysis of results is straightforward and optimum or harmful temperatures, whether constant or alternating, are easily identified.

A removable Perspex grid effectively divides the working area into 196 miniature incubators, and thus, many samples can be tested simultaneously. An eight channel data logger provides a time/temperature plot from five probes located on the underside of the plate (one in each corner and one in the centre). Applications include seed testing, seed physiology, microbiology, entomology, biotechnology etc.

| Catalogue No | Description  |
|--------------|--|
| AG63-200     | Temperature range: Cold edges, °C: +5 to 30<br>Hot edges, °C: ambient +5 to 45 |
|              | Stability, °C:± 0.5  |
|              | Temperature display:Digital  |
|              | Weight, kg:300   |
|              | Dimensions (LxWxD), mm:1030 x 1020 x 1020                                      |
|              | Power: 2050W   |

AG63-300



## Soil/Sand Steriliser

A sterilisation unit that is designed to eliminate soil-borne pests, disease and weed seeds that inhibit the growth of plants. The unit can also be used for the sterilisation of sand prior to germination testing.

This insulated steriliser represents the simplest, cleanest and most effective method of carrying out sterilisation (86.6°C). The matter is placed on the large surface areas of the special aluminium panel resistance elements. It is filled at the top and emptied through the bottom, with an electrical loading of 1.5kW. Sterilisation is completed in about 90 minutes with a consumption of 21/4 units of electricity. After treatment, the sand or soil should be cooled rapidly and stored in sterile conditions. Supplied with a dial type thermometer.

| Catalogue No | Description                                 |
|--------------|---|
| AG63-300     | Loading, kW: 1.5                            |
|              | Capacity, litres: 34                        |
|              | Sterilisation duration: 90 minutes (approx) |
|              | Dimensions (lxwxh), mm: 685 x 255 x 520     |
|              | Weight, kg: 27                              |
|              | Power: 220/ 240V AC 50Hz                    |

AG63-350



## Dehumidifier

Desiccant dehumidifier designed for humidity control across a wide range of dewpoint temperatures. This is a completely self-contained unit including desiccant rotor, fan, filters, electrical reactivation and controls.

The unit is ready for connection to standard size duct works, electrical power supply and external humidity sensor. It is enclosed within a stainless steel casing.

| Catalogue No                     | Description   |
|----------------------------------|---|
| AG63-350                         | Dehumidification capacity (at +20°C and 60% RH):4.4 kg/h              |
|                                  | Dry air flow (at 150 Pa available external pressure):800 m³/h         |
|                                  | Wet air flow (at 175 Pa available external pressure):250 m³/h         |
|                                  | Electrical power supply (3x 400V, 50Hz):Adjustable resettable cut-out |
|                                  | Electrical power:7 kW, 400V AC, 50Hz, 3Ph                             |
|                                  | Maximum noise level: 60 dB (A)  |
|                                  | Weight, kg: 80  |
| Dimensions, mm: 1050 x 600 x 690 |   |



## Automatic Jacobsen Seed Testing Bath

AG63-400

The Automatic Jacobsen Seed Testing Bath provides the conditions specified for seed germination testing according to the regulations of the International Seed Testing Association (ISTA)

This equipment allows setting and maintenance of seed germination testing, where an eight hour period of operating at 30°C is followed by a sixteen hour period at 20°C. The thermostatically controlled water circulator is intended for use in an environment of 17 to 18°C. This will allow a natural radiation of heat through the bath bottom and a drop to 20°C will take about 2 hours without chilled water assistance. However, the temperature controller will accept cooling water into its heat exchanger if there are difficulties in maintaining the lower set point.

The stainless steel water bath is designed to hold 13 stainless steel plates about 25 mm above the water level. Each plate will hold five test pads that are individually protected by a small plastic cover. These covers provide controlled micro environments to each germination test.

| Specifications               |                               |
|------------------------------|-------------------------------|
| Temperature range, °C:       | 10 to 50                      |
| Heating power:               | 2000W                         |
| Over-temperature protection: | Adjustable resettable cut-out |
| Voltage:                     | 200/240 VAC                   |
| Dimensions (LxWxH), mm:      |                               |
| Tank:                        | 1220 x 500 x 65               |
| Support frame:               | 1220 x 500 x 812              |
| Glass plates:                | 495 x 90 x 6                  |

- Stainless Steel water bath with high flow capability for fast responsive control of pre-set temperatures
- Programmable temperature and time controller, allowing three user defined programmes or choice from six predefined programmes.
- Design optimised to operate at the 20°C and 30°C standard germination cycle.
- Temperature controller with 2000 watt heater and a high flow circulation pump. Standard operating voltage is 220/250 Vac.
- Facility to assist water bath cooling with chilled water if ambient is too high.
- Stainless steel support frame.
- Focused temperature probe to detect seed bed temperature.

| Catalogue No | Description  |
|--------------|--|
| AG63-400     | Jacobsen Seed Testing Bath, system with tank, circulator, pipes, and drain tap. Supplied complete with 12 x stainless steel plates, 60 x plastic covers, and a pack of 500 filter papers |
| AG63-400SP   | Spare Parts Kits for Jacobsen Seed Bath comprising, 12 x stainless steel plates, 60 x plastic covers, and pack of 500 filter papers  |

## Germination Trays

AG63-600

Germination trays made of black plastic with a standard propagation lid with 24 sections. Convenient design allows for stacking. Dimensions, 375 x 240 x 55mm.

| Catalogue No | Pack Quantity |
|--------------|---------------|
| AG63-600     | 200           |







AG63-650



## Seed Germination Test Paper

Wagtech offer a wide variety of germination test paper including white pleated stripes and circles; available in a variety of sizes and quantities. Outlined below is one example of such items.

| Catalogue No | Description  |
|--------------|--|
| AG63-650     | Regular Weight Germination Paper: 10"x15" 6000 sheets. |

## Tetrazolium Salt

Germination percentage is a good measurement of seed quality. One disadvantage of conventional germination tests is that they require a waiting period of two weeks or more. The Tetrazolium test is a biochemical test that can be conducted in a short period of time with minimal equipment, and results are produced as a percentage viability. The test uses these Tetrazolium salts in a combination of staining and sequential sampling. It can also be applied to individual seeds that remain hard and fresh but have not germinated at the end of a germination test. Supplied in 100g pack.

| Catalogue No | Description      |
|--------------|------------------|
| AG63-700     | Tetrazolium Salt |



## Ultraviolet Lamp Hand Held

A hand held UV lamp offering longwave, shortwave or multiband longwave/shortwave UV modules. This lightweight device has a comfortable, ergonomically designed handle and a snap-on wavelength selector for easy switching between wavelengths. The on/off switch is located on the back of the lamp.

| Catalogue No | Description                           |
|--------------|---------------------------------------|
| AG63-800     | Wave-length, nm: 365                  |
|              | Power: 230V/50Hz                      |
|              | Dimensions (lxwxh), mm: 378 x 81 x 64 |
|              | Weight, kg: 0.90                      |

AG63-800



## Dissecting Set

Consisting of the following stainless steel instruments enclosed within a PVC roll:

- 3 x scalpels, 35mm, 45mm, 50mm
- 2 x needles
- 1 x seeker
- 1 x section lifter
- 1 x forceps, blunt
- 1 x forceps, sharp
- 1 x forceps, sharp, curved
- 1 x scissors, fine
- 1 x scissors, blunt
- 1 x section razor

AG63-900



| Catalogue No | Description    |
|--------------|----------------|
| AG63-900     | Dissecting Set |

### NOTE:

For a further range of UV products and Dissecting Equipment. Please refer to our General Lab Catalogue.



## Grain Splitter

This grain splitter has been designed to reliably and accurately split barley, wheat or maize grains with the intention of exposing the germ in readiness for viability stain testing.

Constructed from stainless steel for visual durability and ease of cleaning, the simple design was conceived for use by unskilled operatives in either laboratory or field environments. The split grains are separated and then collected in small trays that lock into the machine to ensure minimal spillage.

Dimensions, cm: 30 x 16 x 16, Weight, kg: 6

| Catalogue No | Description                        |
|--------------|------------------------------------|
| AG63-910     | Grain Splitter for barley or wheat |
| AG63-912     | Grain Splitter for maize           |

## Germination Tester

Testing malting barley (and other seeds) for a viable germ has never been simpler. This cost-effective solution has been developed in conjunction with end users to meet the need for fast turnaround testing in one space efficient unit .

The thermostatically controlled test vessel maintains  $40 \pm 2^\circ\text{C}$  using negligible power. The thermostat is limited to  $50^\circ\text{C}$  so that overheating of the test salts is not possible. One button of the control unit allows temporary energisation of the vacuum pump whilst the other button allows evacuation or venting of the test vessel. Once evacuated, the efficient vacuum seals maintain negative pressure throughout the test.

The vacuum pump is small, very quiet, requires no oil and is virtually maintenance-free. It takes about 5 seconds to achieve its max 25" Hg (850 mbar). It is supplied with sufficient pipe-work and cable to allow under-bench mounting.

- Simultaneous testing of both sample halves.
- At least SIX sample tests with independent start times can be conducted together.
- Process temperature continuously monitored in the test vessel.
- All equipment powered via a single mains input
- Quiet vacuum pump can be sited away from work surface
- A control unit allows simple evacuation of the test vessel to 850 mbar
- Extremely economical and efficient 350 watt heater module, 220/240 AC 50HZ, 1ph

Dimensions, cm: 61 x 61 x 55, Weight, kg: 16

| Catalogue No | Description                           |
|--------------|---------------------------------------|
| AG63-920     | Germination Tester, supplied complete |

AG63-910



AG63-920





# Seed Counting, Weighing & Grading

A complete range of equipment for use in both the laboratory and in the field, for the accurate counting, weighing, and grading of seeds. Forming an essential component of effective crop management, this process ensures that the destructive elements of a sample (i.e. weed seeds, soil/straw dust, damaged and under- or over-sized seed) are removed from the lot, ensuring quality produce is obtained.

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## Electronic Grain Counter

This Grain Counter provides reliable counts for a variety of seeds. This instrument is robustly constructed in steel with a powder coat paint providing a hard wearing finish.

Grains falling into the counter from the feeder tray interrupt a beam before passing into the collection tray. This creates pulses which register as numbers on the easily read display. When the pre-selected number has been reached, a control signal stops the feeder and 'count complete' will show on the control panel.

Specially developed firmware resident in the microcontroller uses error detection algorithms to minimise "double counting" and errors of counting undersized samples such as counting split grains as two grains.

- Suitable for use with a wide variety of seed sizes
- Grain feed rate adjustable via the keypad for optimum efficiency and for calibration.
- Once calibrated, counting is automatically controlled for pre-determined grain sizes/types.
- Flexibility of count totals and batch numbers
- Automatic cut-off
- LCD display

| Catalogue No | Description                                    |
|--------------|--|
| AG64-100     | Grain size range, mm: 0.3 to 15                |
|              | Variable speed: Depending on grain size        |
|              | Electrical power supply: 230 VAC, 50-60Hz, 1ph |
|              | Weight, kg: 16                                 |
|              | Dimensions, mm: 430 x 235 x 380                |

AG64-200



## Hectolitre Weight Measurement

This is a laboratory instrument packed in a custom carrying case and comprises an engineered stainless steel measuring tube (chondrometer), electronic digital balance (battery or mains operated), sample container falling weight, cut off slide and reference chart.

The grain is allowed to fall into the lower chamber of the chondrometer under the restriction of a falling weight, which is a standard operation at all times.

The grain is weighed on the balance and the weight in grammes is converted at a glance to Hectolitre weight via the calibration chart supplied.

| Catalogue No | Description                   |
|--------------|-------------------------------|
| AG64-200     | Hectolitre Weight Measurement |



## Test Sieves

These test sieves are simple, easy to use instruments that have long been one of the most widely used methods for particle size analysis and size distribution of samples.

A complete set of 36 test sieves are supplied in this kit.

The sieves are suitable for a wide variety of applications from soil studies through to the standardisation and grading of harvested grain. The sieves are 200mm in diameter, range in aperture size from 38 microns to 16mm, and are compliant to ISO standards 565 and 3310,1.

| Catalogue No | Description  |
|--------------|--|
| AG64-300     | Set of 36, 200mm test sieves ranging in aperture size from 38 microns to 16mm. Constructed of stainless steel frame & mesh, the set comes complete with a lid and receiver |

## Accessories

| Catalogue No | Description  |
|--------------|--|
| AG64-302     | Cover/receiver sets, Stainless Steel.                              |
| AG64-304     | Sieve Brush: Double ended for use with both fine and coarse sieves |

## Grain Counters

A simple and convenient method for counting seeds and grains in order to ensure an accurate count is made at all times. This instrument is ideal for the testing of 100 seed counts, and comes in two options; one for Barley and Wheat, and the other for Oil Seed Rape.

- Counts 100 seeds in seconds
- Easy to use, experience is not necessary
- Faster than other methods
- A must for busy laboratory

| Catalogue No | Description                       |
|--------------|-----------------------------------|
| AG64-400     | Grain counter for Barley or Wheat |
| AG64-402     | Grain counter for Oil Seed Rape   |

## Vacuum Seed Counter

Used for counting and depositing seed on paper substrates. Comprises 3 x components; an adjustable vacuum system with connecting hose, a number of counting heads and a valve to dissipate the vacuum. 2 x counting heads are supplied as standard, 70mm dia, with 100 holes, one with 0.7mm hole dia and one with 1.0mm hole dia. Other heads are available. Power: 240V AC 50HZ  
Dimensions: 270 mm x 440 mm x 220 mm, Weight: 6 kg.

| Catalogue No | Description  |
|--------------|--|
| AG64-410     | Vacuum Seed Counter, supplied complete with 2 counting heads |

## Seed Planting Head, with Vacuum Pick-Up

This system automatically picks up 100 seeds under vacuum and is ideal for testing or planting a variety of seeds. With the planting head constructed of high quality brass or alloy, and the valve constructed of brass, the unit will pick up and release a wide variety of different seed sizes. Power 240V AC, 50Hz.

| Catalogue No | Description  |
|--------------|--|
| AG64-450     | Seed planting head valve with vacuum unit (without planting head)  |
| AG64-451     | Planting Head for use with vacuum Seed Planter (AG64-450)<br>Circular heads with holes 1.8mm dia, Head dia 125mm |
| AG64-454     | Planting heads: Rectangular in Alloy. 310mm x 185mm with hole sizes to order                                     |
| AG64-456     | Planting head valve  |

AG64-300



AG64-400



AG64-410

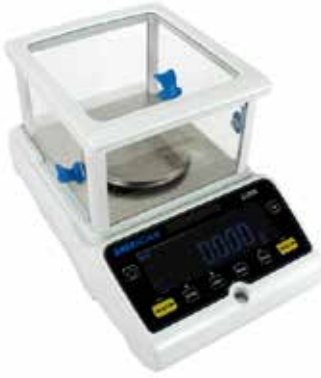


AG64-450





AG64-500



## Balances, Precision

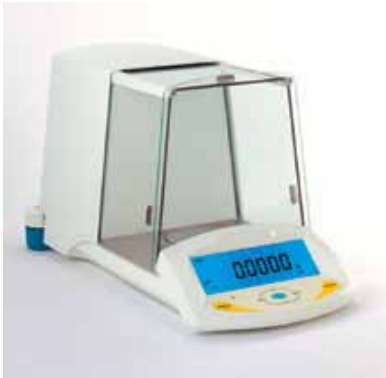
- Large easy to read backlit LCD display
- Large, grade 304 stainless steel pan allows easy cleaning
- Below pan weighing facility
- 12 different weighing units as well as a custom unit
- USB and RS-232 communication to computers and printers
- Internal automatic or external calibration models
- Auto power-off to save energy. AC adapter included

| Catalogue No          | Capacity, g | Readability | Platform size, mm (WxL) |
|-----------------------|-------------|-------------|-------------------------|
| Internal Calibration  |             |             |                         |
| AG64-500              | 220         | 1mg         | 120mmØ                  |
| AG64-502              | 420         | 1mg         | 120mmØ                  |
| AG64-504              | 2600        | 0.01g       | 185 x 185               |
| AG64-506              | 4600        | 0.01g       | 185 x 185               |
| External Calibration: |             |             |                         |
| AG64-508              | 220         | 1mg         | 120mmØ                  |
| AG64-510              | 420         | 1mg         | 120mmØ                  |
| AG64-512              | 2600        | 0.01g       | 185 x 185               |
| AG64-514              | 4600        | 0.01g       | 185 x 185               |

## Accessories

| Catalogue No | Description               |
|--------------|---------------------------|
| AG64-534     | Thermal Printer           |
| AG64-516     | Weigh below hook          |
| AG64-518     | Density determination kit |
| AG64-522     | In-use cover              |

AG64-524



## Balances, Analytical

- Large easy to read backlit LCD display
- Large, grade 304 stainless steel pan allows easy cleaning
- 14 different weighing units as well as a custom unit
- USB and RS-232 communication to computers and printers
- Internal automatic calibration models
- Auto power-off to save energy. AC adapter included

| Catalogue No | Capacity, g | Readability, mg | Pan diameter, mm |
|--------------|-------------|-----------------|------------------|
| AG64-524     | 120         | 0.1             | 80               |
| AG64-526     | 210         | 0.1             | 80               |
| AG64-528     | 250         | 0.1             | 80               |

## Accessories

| Catalogue No | Description               |
|--------------|---------------------------|
| AG64-534     | Thermal Printer           |
| AG64-530     | Density Determination Kit |



# Laboratory Chemical Analysis

A wide range of specialised analytical and general laboratory equipment is required to carry out a full analysis of soil and plant material. These can be summarised as follows:

Atomic Absorption Spectrophotometry (AAS), Gas Chromatography (GC), Spectrophotometry, Flame Photometry, Colorimetry, Ion Selective Electrodes, Microscopy, Titration, Kjeldahl, Soxhlet, Dietary Fibre

Details of these instruments can be found in our General Laboratory Catalogue or in our Environmental Catalogue.

However, for research work involving soil and crops, specific tests are required in particular for protein determination, extraction of fats and oils, and the analysis of dietary fibre. This section contains details of the instruments required to carry out these tests.

## Solvent Extraction of Soluble Substances

### Randall's Technique

The first phase of extraction is performed by immersing a sample - containing thimble, in boiling solvent followed by a washing with cold refluxing solvent.

The fast solubilisation achieved by the hot solvent results in a sharp reduction of extraction time.

### Soxhlet Technique

The solubilisation of extractable components is performed by a cold solvent dropping from a reflux condenser. Consequently, a complete extraction lasts many hours.

## Kjeldahl Method for Nitrogen Determination

The Kjeldahl's method is named after the Danish chemist who developed it more than a century ago. Today, the method is widely used according to official methods to determine nitrogen and proteins in food, feed, soil, waste water etc.

The equipment in this section allows you to perform the Kjeldahl method easily and with reproducible results.





AG71-100



## Digestion Units

These are widely used instruments within laboratories performing analysis for different applications such as digestions in the Kjeldahl process for protein determination and analysis in the environmental field.

A user-friendly program menu allows for the selection of up to 20 work programs, while 4 temperature ramps are available for the simultaneous digestion of 6, or 20 samples in test tubes of different dimensions. These instruments are provided with a wide range of options (temperature selections, programmable permanence time, continuous working mode availability etc) and with a visualisation display which allows for the desired values to be set and to monitor the digestion progress.

**Please note: The operating accessories are necessary for the correct functioning of the instruments**

- High accuracy - temperature precision is  $\pm 0.5\%$ , with a heating speed of 20 to 420°C in 30 minutes
- RS232 interface - for PC data transfer and storage according to GLP
- Safety - Electronic microprocessor checks and automatically calibrates the heating block's temperature
- Customisable - the operator can choose among 6 different languages

AG71-102



AG71-106



AG71-108



| Catalogue No    | Description                  |
|-----------------|------------------------------|
| <b>AG71-100</b> | Digestion Units - 6 samples  |
| <b>AG71-102</b> | Digestion Units - 20 samples |

| Catalogue No            | AG71-100                                 | AG71-102                                  |
|-------------------------|--|---|
| Number of samples:      | 6 in 250ml tubes with 42mm $\varnothing$ | 20 in 250ml tubes with 42mm $\varnothing$ |
| Temperature range, °C:  | From room temperature to 450             |   |
| Construction material:  | Epoxy painted stainless steel structure  |   |
| Selectable programs:    | 20 with 4 ramps for each programs        |   |
| Selectable durations:   | from 001 to 999 minutes                  |   |
| Power supply:           | 230V / 50-60Hz                           |   |
| Power, W:               | 1100                                     | 2300                                      |
| Weight, kg:             | 10                                       | 24  |
| Dimensions (wxhxd), mm: | 293 x 152 x 339                          | 393 x 152 x 446                           |

## Operating Accessories

| Catalogue No    | Description   |
|-----------------|---|
| <b>AG71-104</b> | Test tubes, $\varnothing$ 42x300mm, 250ml, 3 pcs/box, for use with both units |
| <b>AG71-106</b> | Glassware handle with heat shields, for use with AG71-100                     |
| <b>AG71-108</b> | Suction cap, for use with AG71-100  |
| <b>AG71-110</b> | Support system, for use with AG71-100   |
| <b>AG71-112</b> | Glassware handle with heat shields, for use with AG71-102                     |
| <b>AG71-114</b> | Suction cap, for use with AG71-102  |
| <b>AG71-116</b> | Support system, for use with AG71-102   |





## Recirculating Water Pump for Fumes Aspiration

AG71-300

Recirculating water pump that lets two different timed modes for the digesters to be selected. This ensures optimum aspiration depending on the digestion phases and the number of samples in the digester connected to the pump.

Lack of adequate water mains pressure or its high consumption frequently prevent common water pumps from being used. This unit consists of a tank where the water introduced is recirculated continuously, offering considerable savings on water. The type and quality of the materials used make the instrument extremely quiet and long-lasting, and guarantee a high flow rate (up to 35 l/min).

Combined with the scrubber unit, it provides the ideal complement to achieve highly effective fume neutralization that is developed during acid digestions.

The unit is supplied complete with a Viton tube, 10 x 14mm diameter

- Automatism and optimization of the sucking power
- Strongly reduced water consumption in comparison to water jet pumps connected to tap
- Possibility of avoiding emission into the atmosphere of gaseous pollutants or polluted waters into drainages
- Independent from tap water contingencies like low water availability or low pressure



| Catalogue No    | Description   |
|-----------------|---|
| <b>AG71-300</b> | Air flow max, l/min: 35                             |
|                 | Flow regulation, l/min: from 0 to 35                |
|                 | Residual pressure with water temp. of 15°C: 35 mmhg |
|                 | Power: 160 W  |
|                 | Power supply: 230 V / 50 Hz                         |
|                 | Weight, kg: 8.4                                     |
|                 | Dimensions (wxhxd), mm: 250 x 400 x 370             |

## Scrubber

AG71-350

A scrubber, that when connected to the Recirculating Water Pump, is designed to neutralise corrosive and toxic fumes that develop during oxidative mineralizations or other processes. The system is supplied in the configuration consisting of two stages; condensation, and neutralisation.

The instrument can be supplied with a third (optional) stage, generally used with samples that generate high amounts of fumes during digestion (e.g. soybean). The unit has a broad range of applications, from the Kjeldahl method to neutralisation with acids and bases. Thanks to the elevated surface of contact between gas and liquid, the unit provides effective cleaning of the fumes, preventing their hazardous emission into the laboratory and the environment.

- A highly efficient neutralization, due to the optimized gas-liquid contact
- Safe and practical to use
- Simple disposal of condensates
- Simple control and replacement of neutralizing solution



| Catalogue No    | Description  |
|-----------------|--|
| <b>AG71-350</b> | Construction material: Epoxy painted stainless steel structure |
|                 | Weight, kg: 3.5  |
|                 | Dimensions (wxhxd), mm: 300 x 500 x 190                        |

## Accessories

| Catalogue No    | Description                           |
|-----------------|---------------------------------------|
| <b>AG71-352</b> | Filter for activated carbon           |
| <b>AG71-354</b> | Pack of 10 refill of activated carbon |







AG71-400



## Distillation Units

Distillation units that are designed for diversified and flexible use, including applications such as determining ammoniacal nitrogen, protein nitrogen, (Kjeldahl or direct alkaline distillation), nitric nitrogen (after reduction), phenols, volatile fatty acids, cyanides, alcohol content, etc, according to official procedures.

The units come with a patented steam generator that assures distillations are carried out in absolute safety and without routine maintenance. The supply water feed is automatically stopped during pauses, thus cutting down on its consumption. The instrument is equipped with a system that recognises when the sliding protection door is not closed and when the test tube is not in position, without which the dosing pump does not start operation. Use of an innovative system allows various sizes of test tubes to be used and 500 ml Kjeldahl flasks to be housed. Both units work in accordance with official methods AOAC, EPA, DIN e ISO, with model AG71-400 representing the basic unit, and model AG71-402 the more advanced, semi-automatic unit. Supplied complete with 42mm Dia x 300mm - 250ml test tube, flask, tongs and inlet tube.

AG71-402



- A maintenance-free steam generator that uses deionised water
- Innovative titanium condenser that achieves outstanding heat exchange and higher resistance than glass, and that is also easy to clean
- Technopolymer splash head (alkali-resistant) that ensures a longer lifetime

| Catalogue No    | Description                    |
|-----------------|--------------------------------|
| <b>AG71-400</b> | Distillation Units - Manual    |
| <b>AG71-402</b> | Distillation Units - Automatic |

| Catalogue No                                     | AG71-400                                | AG71-402        |
|--|---|-----------------|
| Analysis time of 100ml of distillate:            | 5 minutes                               | 4 minutes       |
| Time related to start for Devada alloy analysis: | 0 to 99 minutes                         | 0 to 30 minutes |
| Steam generator:                                 | Deionised / Distilled water             |                 |
| Distillation residual removal:                   | Manual                                  | Automatic       |
| Reproducibility (RSD):                           | < 1 %                                   |                 |
| Recovery:  | > 99.5 % at nitrogen levels 1 - 200 mgN |                 |
| Detection limit:                                 | > 0.1 mgN                               |                 |
| Sodium hydroxide addition:                       | Automatic                               |                 |
| Dilution water addition:                         | Manual                                  | Automatic       |
| Boric acid addition:                             | Manual                                  |                 |
| Sodium hydroxide addition:                       | Automatic                               |                 |
| Dilution water volume:                           | -                                       | 0 to 200 ml     |
| Boric acid volume:                               | -                                       | 0 to 100 ml     |
| Steam flow regulation:                           | -                                       | 0 to 100 %      |
| Tap water consumption:                           | 0.5 l/min at 15°C - 1 l/min at 30°C     |                 |
| Weight, kg:                                      | 25                                      | 26              |
| Dimensions, mm:                                  | 385 x 780 x 416                         | 385 x 780 x 416 |
| Power:   | 240V AC 50HZ                            |                 |

## Accessories

| Catalogue No    | Description  |
|-----------------|--|
| <b>AG71-104</b> | Test tubes, Ø 42 x 300mm, 250ml, 3 pcs/box         |
| <b>AG71-404</b> | Test tubes, Ø 26 x 300mm, 100ml, 6 pcs/box         |
| <b>AG71-406</b> | Test tube, Ø 48 x 260mm, 300ml                     |
| <b>AG71-408</b> | Spacer for test tube Ø 48 x 260mm                  |
| <b>AG71-410</b> | Test tube, Ø 80 x 300mm for alcohol determination  |
| <b>AG71-412</b> | Test tube connection Ø 26mm, Ø 48mm, 500ml balloon |



## Solvent Extractors

AG71-500

Solvent extractor units which allow for a substance or group of substances to be quantitatively separated (e.g. fat) from a mixture of solids or semisolids. Extraction is carried out in accordance with the Randall technique, which works in two phases (plus one to recover the distilled solvent). This technique offers protection against atmospheric pollution, and cuts analysis costs and extraction time.

The instruments, designed to optimise ease of handling, are provided with a microprocessor allowing up to 29 different work programs to be set.

The operational phases set will be carried out in sequence with the temperature and remaining time constantly shown on two different displays. The analyses are performed in absolute safety thanks to its IP55 protection rating.

The main fields of application include analysis of food products, animal feeds, detergents, rubber and plastic formulations, pharmaceutical products, soils, etc. for the content of soluble products such as fats, detergents, plasticizers and pesticides.



**AG71-500** is supplied complete with 3 extraction cups, 25 extraction thimbles, 3 extraction thimbles holders, an inlet tube, heat shield, 3 butyl seals and 3 viton seals.

AG71-502

**AG71-502** is supplied complete with 6 extraction cups, 25 extraction thimbles, 6 extraction thimbles holders, an inlet tube, heat shield, 6 butyl seals and 6 viton seals.



| Catalogue No                    | AG71-500        | AG71-502        |
|---------------------------------|-----------------|-----------------|
| Number of samples:              | 3               | 6               |
| Number of programs:             | 29              |                 |
| Max. volume extraction cup, ml: | 150             |                 |
| Working temperature, °C:        | from 100 to 260 |                 |
| Solvent recovery:               | from 50 to 75%  |                 |
| Reproducibility (RSD):          | < 1%            |                 |
| Power supply                    | 230 V / 50-60Hz |                 |
| Power, W:                       | 500             | 950             |
| Weight, kg:                     | 30              | 40              |
| Dimensions (wxhxd), mm:         | 480 x 620 x 390 | 700 x 620 x 390 |

## Accessories

| Catalogue No | Description   |
|--------------|---|
| AG71-504     | Extraction cup - 6 pcs/box - for use with both units        |
| AG71-506     | Vaflon seal - for use with both units                       |
| AG71-508     | Thimble weighing cup - for use with both units              |
| AG71-510     | Handling device for extraction cups - for use with AG71-502 |
| AG71-512     | Pincer for weighing cups - for use with AG71-502            |
| AG71-514     | Thimbles stand (6 places) - for use with AG71-502           |



AG71-600



## Dietary Fibre Extractor

This unit allows the final filtration and washing phase envisaged by the enzymatic method to be rationalised in dietary fibre determination. Used together with the Enzymatic Digester, this unit operates according to the official method AOAC n.o. 985.29 for the determination of the total time required compared to a manual procedure.

The glass funnels facilitate the introduction of the digested sample and the solvents in the instrument. The possibility of working with vacuum enables the filtering and the final washings to be completed in a shorter amount of time. The unit comes complete with 6 glass crucibles and these are also available as individual components, see below.

| Catalogue No    | Description  |
|-----------------|--|
| <b>AG71-600</b> | Construction material: Epoxy painted stainless steel structure |
|                 | Peristaltic pump: High suction capacity                        |
|                 | Counter pressure: Electronic setting                           |
|                 | Residues collecting: Separate                                  |
|                 | Filtration time: Shortening                                    |
|                 | Power: 220 W   |
|                 | Power supply: 230 V / 50-60 Hz                                 |
|                 | Weight, kg: 28   |
|                 | Dimensions (wxhxd), mm: 750 x 420 x 380                        |

### Accessories

| Catalogue No    | Description               |
|-----------------|---------------------------|
| <b>AG71-602</b> | Glass crucible, 6 pcs/box |

AG71-700



## Enzymatic Digester

The analytical procedure for the determination of the dietary fibre requires the digestion of the sample with thermostable enzyme, a process that reproduces more effectively than the chemical methods that occur during the natural phenomena experienced through digestion in man and animals.

This Enzymatic Digester operates according to the official method AOAC n.o. 985.29 for the determination of the total dietary fibre. The unit optimises the delicate phase of the enzymatic digestions of the sample, working in reproducible and standardised conditions in order to obtain final reliable results. The elevated performance is guaranteed due to a multiple magnetic stirrer that assures a continuous and constant sample mixing avoiding the sample overheating at the same time.

| Catalogue No    | Description   |
|-----------------|---|
| <b>AG71-700</b> | Temperature range, °C: from room temperature to 105 |
|                 | Power: 900 W  |
|                 | Power supply: 230 V / 50-60 Hz                      |
|                 | Weight, kg: 6.2                                     |
|                 | Filtration time: Shortening                         |
|                 | Dimensions (wxhxd), mm: 413 x 295 x 410             |

### Accessories

| Catalogue No    | Description          |
|-----------------|----------------------|
| <b>AG71-702</b> | Beaker, 400ml        |
| <b>AG71-704</b> | Stirring Bar, 6x35mm |



## Pycnometer

The aluminium-alloy pycnometer is designed to measure the volume of materials via liquid displacement through a 1/8" (3.2mm) hole in the lid. The instrument has an 11.5 mL capacity.

| Catalogue No | Description                |
|--------------|----------------------------|
| AG71-800     | Aluminium-alloy pycnometer |

AG71-800



## Fluorometer

This bench-top unit accurately measures down to extremely low PPT concentrations of mycotoxins in crop samples. Expanded data storage capacity allows for storage of all the mycotoxin test protocols and calibration levels, as well as up to 200 test results. Stored testing protocols provide for a digital readout in PPM, PPB, PPT, mg/kg, µg/kg, or ng/kg concentration units without requiring any conversion.

- Simple — Choose test, insert sample, read results
- Comprehensive — Stores up to 20 test protocols, 200 test results, and calibration parameters for each test protocol
- Accurate — Digital readout in PPM, PPB, PPT, mg/kg, µg/kg or ng/kg
- Durable — Over 200,000 tests without a lamp change
- Stable — Extended period without a lamp change
- Versatile — Can be used over a wide range of ambient conditions

AG71-900



| Catalogue No | Description  |
|--------------|--|
| AG71-900     | Fluorometer unit for accurate analysis of mycotoxins |

AG71-902

## Operating Accessories

| Catalogue No | Description                                       |
|--------------|---|
| AG71-902     | Single-Position Pump Stand w/Hand Pump            |
| AG71-904     | Commercial blender with stainless steel container |
| AG71-906     | Glass blender jar                                 |
| AG71-908     | Vortex mixer                                      |



AG71-904

AG71-906

AG71-908





## Supplies & Consumables



AG71-950



## Digital Caliper

Digital calipers use linear encoders to measure internal and external distances. This is then shown on a digital display which is simple to use and easy to read. This handy tool is available with metric and imperial conversions so you can accurately measure objects with ease. Digital calipers are useful tools, and no laboratory should be without one. With superior accuracy, digital calipers are easier to use than the traditional analogue devices. Measure in either inches or millimetres at the touch of a button. The floating zero feature allows you to read the increment without calculation.

- Clear LCD display
- Stainless Steel construction
- Origin setting
- Switchable On/Off
- Thumbwheel for fine adjustment
- Knurled locking screw
- Supplied with battery

| Catalogue No | Description     |
|--------------|-----------------|
| AG71-950     | Digital Caliper |

| Catalogue No | Description                                       |
|--------------|---|
| AG71-910     | Columns for Fluorometer (50 per box)              |
| AG71-912     | 50mL bottle dispenser for developer (0-3mL range) |
| AG71-914     | Cuvette rack                                      |
| AG71-916     | Fluted filter paper, 24cm (100)                   |
| AG71-918     | Microfiber filters, 1.5 µm, 11cm (100)            |
| AG71-920     | Kim wipes   |
| AG71-922     | Developer (50mL)                                  |
| AG71-924     | Mycotoxin calibration standards                   |
| AG71-926     | Tween 20 (50mL)                                   |
| AG71-928     | Disposable cuvettes (250 per pack)                |
| AG71-930     | Disposable plastic beakers (25 per pack)          |
| AG71-932     | Filter funnel, 65mm (10 per pack)                 |
| AG71-934     | Filter funnel, 105mm (4 per pack)                 |
| AG71-936     | Printer paper rolls for Fluorometer               |

# Mobile Laboratories



Wagtech have many years' experience in creating bespoke Mobile Laboratories, which are ideal for situations where central fixed laboratory sites are either not available or not practical.

We use many different brands and models of vehicles, from Land Rovers to Ford Rangers, to Toyota Hilux's and Land Cruisers, so that we can find a solution that meets not only your budget, but also your exact requirements.

The most efficient Mobile Laboratories are mounted directly on or into the rear of a suitable vehicle and can provide well equipped facilities for a broad range of testing, and are often the laboratory of choice when civil works make construction of a fixed site laboratory too expensive.

The Wagtech range of Mobile Laboratories are specifically designed for each application and offer complete flexibility of design, including:

- Single or double cab options
- Generators
- Water, electricity and gas services
- Waste disposal
- Solar water heating systems
- Laboratory space that can either be entered on foot, or accessed while outside the vehicle
- Storage solutions
- Refrigeration
- Overhead lighting
- Complete fit out of laboratory equipment and consumables



## MOBILE LABORATORY ADVANTAGES

- Laboratory quality testing in remote locations
- Able to access even the most difficult areas
- Allows immediate testing of samples, without the need to transport
- Allows non-portable laboratory equipment to be used in the field, giving a greater range of tests in a field testing environment
- Allows fast and simple area survey without the high cost of local laboratory infrastructure



## MOBILE BOX LABORATORY

### AG95-200

Mobile Box Laboratories are an enclosed built laboratory fixed directly onto a vehicle rather than inside, with the ability to uniquely customise to the user's required needs. These can provide more space and work area with the options of a single or double cab vehicle. The Mobile Box Laboratory is one of the most popular options, which is being used around the world in a range of sectors.



## MOBILE 4X4 LABORATORY

### AG95-100

Entry-level Mobile 4x4 Laboratories offer a smaller and more compact laboratory space which is directly built within the vehicle, with no changes to the vehicle size. Having the lab fully contained within the vehicle means it has the ability to be deployed in the roughest of terrain.



## MOBILE VAN LABORATORY

### AG95-300

The Mobile Van Laboratory combines the large workspace of a single-cab box laboratory with the fully-integrated approach of the Inbuilt Laboratory. It offers the greatest number of features within the vehicle laboratory range. It has the ability to be tailored to the needs of the user and be provided with all the necessary equipment needed.



## TRAILER LABORATORIES

### AG95-400

Trailer Laboratories offer the largest laboratory space available, more akin to a traditional laboratory and can be deployed either on a temporary or semi-permanent basis. They can also be used as permanent installations as a low cost alternative to expensive civil works project. The Trailer Laboratory can offer all the facilities that a fixed laboratory can provide, including equipment and utilities required for high-end analytical instruments such as HPLC and GC.

# INSTALLATION, COMMISSIONING & TRAINING

**Wagtech Projects supplies equipment all over the world, and the importance of both training and technical support are recognised as essential in the long term success and sustainability of any project.**

Through a well established network of regional offices, agents and distributors, we can offer a range of after sales services including installation, commissioning and training on the use and maintenance of the equipment.

## **Equipment Installation and Commissioning**

A full Installation and Commissioning service is available worldwide from Wagtech Projects through its network of local companies, and fully supported by a team of scientists and technicians from the UK who regularly travel to countries around the world supporting our customers and training our local experts.



In addition to this, product training can be given at our dedicated Technical and Training Centre in Thatcham, UK which has a laboratory and training facilities to handle groups of trainees.

Following successful commissioning of the equipment, on-going product support is available locally and via email and phone contact with experts in the UK if required.

## **Training**

The provision of training has been a key service from Wagtech Projects for many years and we continue to offer and expand this facility.



The training can either take the form of detailed instruction in the use and maintenance of the equipment we supply or we can organise academic training courses in a variety of separate disciplines in the Agricultural and Environmental Sciences both in the UK and overseas.

These courses can be tailored around customer's specific requirements, and at Wagtech Projects we are flexible enough to be able to accommodate most people's wishes.

Please contact us for more information on any training issues you have in mind. We are always pleased to provide advice on equipment selection, or any technical queries that you may have.

We look forward to hearing from you.

