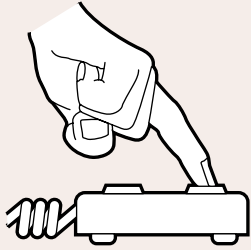


Zeta-Meter System 3.0+



Catalog No.14

Proven Value



Easy to Use



Digital Readout

Practical Instrumentation

More than 30 years ago, we pioneered the development of a simple, reliable instrument to measure electrophoretic mobility and zeta potential.

Our Zeta-Meter System 3.0+, continues this tradition and makes the determination even more convenient.

Reliably Simple

The measurement is very direct. The sample is placed in a viewing chamber called an electrophoresis cell. Then an electric field is activated. This causes the colloids to move with a velocity that is proportional to their zeta potential, and a direction that indicates whether their charge is positive or negative.

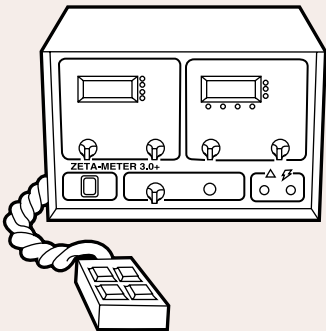
Once your sample is in our cell, you get your first results in a matter of seconds, and complete results in minutes.

Guaranteed Support

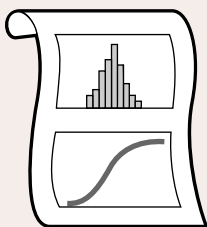
Our instruments are covered by a 2 year limited warranty. In addition, if your Zeta-Meter ever needs servicing and you just can't do without it—don't worry—we'll send you one at no charge. Just pay the freight and insurance and it's yours for as long as we have your system here for repair. In fact, if your unit is under warranty we'll ship the other to you absolutely free. If you are outside the USA we'll ship you easy-to-install replacement parts by express mail or courier service.

We also offer unlimited technical support via telephone (toll-free in the USA), fax or e-mail. We will do everything possible to help you with your Zeta-Meter.

Zeta-Meter 3.0+ Unit



ZM3
Zeta-Meter 3.0+ Unit



Spreadsheet Graphs

Easy to Use

Just fill the cell with your sample, insert the electrodes and connect them to the Zeta-Meter 3.0+ unit. It determines the specific conductance of your sample and helps select the appropriate voltage.

Energize the electrodes and watch the colloids as they move across a grid in your microscope or video display. Track one by simply pressing a button and holding it down while your colloid moves across the grid. When you release the button, your colloid's zeta potential (or electrophoretic mobility) is instantly displayed.

Error Free

The Zeta-Meter 3.0+ is mistake-proof. It recognizes impractical results and tracking times that are too short. You can scrub these or other inconsistent data without losing the rest.

Data Review

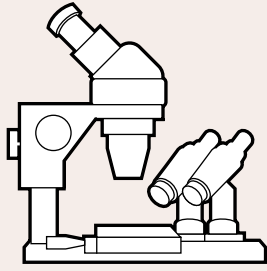
The Zeta-Meter 3.0+ constantly records a summary of your measurements, which you can review at any time. At the press of a key you can see how many colloids you have tracked, their average zeta potential (or electrophoretic mobility) and the statistical standard deviation of your values.

Hard Copy

Connect a parallel port printer to make a hard copy of your data. The print-out lists each value along with operating conditions, and a statistical summary for the run.

You can also feed data directly into the serial port of an IBM PC or compatible. Our free software converts it to a spreadsheet format, and includes Lotus 1-2-3 and Excel templates which allow you to easily graph and review your data.

Microscope Module



U

Unitron Microscope

Superior Optics

We use a high quality, Unitron FSB-4X stereoscopic microscope. It features 20X wide field eyepieces in combination with a 4.0X paired objective. Overall magnification is 80X. A basic Zeta-Meter System 3.0+ with a Unitron stereo microscope is part number ZM3-U-G.

This microscope is very adequate for colloids as small as 1.5 microns in size. If your colloids are smaller than this, then a video display is required.

Module

All microscope components – including illuminators, a mirrored cell holder and an accurate positioning stage – are mounted on a common module. We pre-focus the entire assembly to make your initial setup easy.

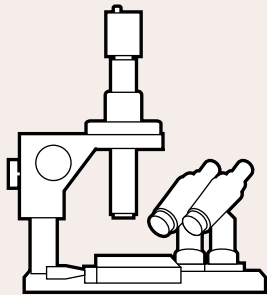
Comfortable Viewing

Our viewing technique is called “dark field illumination”. A sharply focused light beam is reflected diagonally upward by a mirrored cell holder and passes through the cylindrical tube of the electrophoresis cell. Each colloid in its path reflects light upward into the optics, creating a distinct star-like image on a dark background.

Convenient Set-Up

Alignment of the microscope and cell is simple. There is no need to compute and record dial or micrometer settings. Just focus sharply on a special light pattern created by our illumination technique.

Video Displays



D

Direct Video Imaging

Easier Viewing

Our video displays make it even easier to view and track your colloids. A monochrome, low light level, video camera captures the image and transmits it to a 12 inch monitor.

There are two types of video display. Each is suitable for colloids as small as 0.5 microns in size and they produce comparable images.

Direct Video Imaging

This is our first all video offering. It does away with the need for a stereo microscope. The image is transmitted directly to the camera via optics that are specifically designed for a video display. A basic Zeta-Meter System 3.0+ with Direct Video Imaging is part number ZM3-D-G.

Eyepiece Tube Video Display

This provides an upgrade path for the Unitron FSB-4X microscope. In addition, it allows for a visual backup for those that prefer it. The camera assembly is inserted directly into one of the microscope eyepiece tubes. The part number is C203.

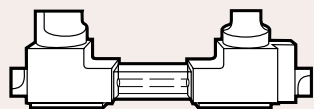
Instant Re-plays

Simply connect a video recorder to the output jack of your video monitor to create a permanent record of your work. Then, if there is a question about your results, you can re-run your test and use the Zeta-Meter 3.0+ unit to obtain another set of data.

C203

Eyepiece Tube Video Display

Electrophoresis Cell



G201

Type GT-2 Cell

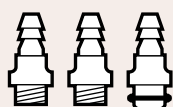
Rugged Yet Precise

Our Type GT-2 electrophoresis cell is rugged, and you can handle it without fear of damage. The cell consists of two Teflon electrode sections and a fused quartz block with an optically polished cell tube. Each cell is individually calibrated and will last a lifetime.

It is immune to attack except by very aggressive reagents which can etch glass, such as hydro-fluoric acid.

AST Fittings

Teflon AST Fittings adapt the Type GT-2 cell for use with the Automatic Sample Transfer. One set is included with the AST (A200).



G205

AST Fittings

Easy to Use

Filling is simple. Just pour in your sample and insert the electrode stoppers. No syringes are necessary. Cleaning is also simple. Just remove the end stoppers and rinse the cell tube with our cell cleaner.

Low Volume Cell

Our standard cell requires at least 20 mL of sample. If your sample volume is limited, then we offer an optional Low Volume Type GT-2 Cell (G201LV) which reduces the sample size to 5mL.

Electrodes



G202

Molybdenum Anode

Simple by Design

Our standard electrodes are a Molybdenum Anode and a Platinum Cathode. You should also consider an optional Platinum Anode for low conductivity samples.

Each electrode is mounted in a threaded Teflon stopper and is supplied with a detachable electrode lead.

Molybdenum Anode

This is our standard anode. Molybdenum combines with gaseous oxygen as it evolves from the anode and prevents false colloid motion due to gas bubble expansion. It can be used with all aqueous samples.

Platinum Cathode

This is our standard cathode. It is a rugged bullet-shaped electrode made of platinum-iridium to minimize interaction with your sample.

Platinum Anode (optional)

This is similar to our Platinum Cathode. It is suitable for samples with a specific conductance of less than 1000 microSiemens/cm. In this conductivity range, it is easier to use than a molybdenum electrode because it does not have to be cleaned.

We recommend this electrode for all work with organic liquids.

We also recommend it for potable water treatment laboratories.



G203

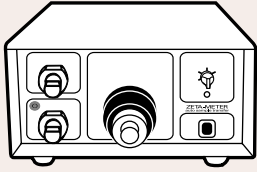
Platinum Cathode



G204

Platinum Anode
(Optional)

Automatic Sample Transfer



A200

Automatic Sample Transfer System

Convenient

The Automatic Sample Transfer (AST) simplifies sample handling. It consists of a recirculating pump and two electric pinch valves. The pump recirculates your sample from a beaker, through the electrophoresis cell and back. This insures sample uniformity, temperature equilibrium and re-suspension of settled colloids. A flip of a switch isolates your sample.

One set of AST fittings (G205) is included. These adapt your cell to the AST unit.

Resuspend Particles

Large particles or flocs can be difficult to track because they tend to settle out of view. The AST resuspends them and flushes them out during recirculation while it introduces fresh particles for tracking.

Balance Sample Temperature

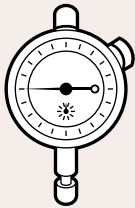
The electric field that is applied during tracking can cause highly conductive samples to gradually increase in temperature. Eventually, thermal currents form in the liquid and the particles begin to move erratically. The AST restores temperature equilibrium by recirculating the sample through the cell.

We recommend the AST when samples have a specific conductance greater than 2500 microSiemens/cm.

Study Concentration Effects

The AST is very helpful when variations in reagent concentration or pH need to be studied. Each incremental dose is added to the sample beaker. Then, the AST is used to flush out the cell and fill it with fresh sample at the new concentration level.

Other Accessories

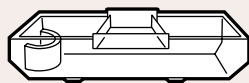


V100

Vertical Micrometer

Vertical Micrometer

Our optical cell alignment technique works with water and with liquids that have an index of refraction close to water. If the index of refraction of your sample is not similar to water, then the focusing pattern will not appear and our Vertical Micrometer is required.



T100

Temperature Control Bath

Temperature Control Bath

Use this if you want to run samples at elevated or reduced temperatures. Zeta potential determinations are made while the electrophoresis cell is submerged in the bath.

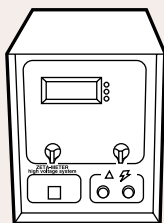
The bath is equipped with inlet and outlet ports and plugs. You supply: a pump, temperature control and interconnecting tubing. Operating range is 5 – 75° C.

High Voltage Power Supply

High voltage is required when you work with organic liquids that have a low dielectric constant or a high viscosity compared to water. High voltage is necessary to induce reasonable rates of colloid motion. Contact us if you would like an evaluation of whether or not a high voltage supply is required for your application.

The power supply is a precision unit. Voltage is set with a 10 turn dial and both voltage and current are monitored by a digital display.

Special electrode leads to connect the system to your Type GT-2 cell are included.



H200

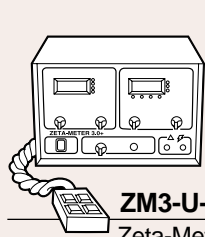
High Voltage Power Supply

Ordering Guide

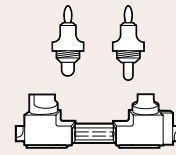
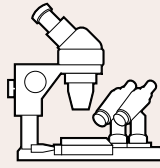
The Basics

Start with part number **ZM3-U-G**, or **ZM3-D-G**. Each is a complete operational system that is ready for you to use. It consists of a Zeta-Meter 3.0+ unit, a microscope or video display, and a Type GT-2 cell with electrodes.

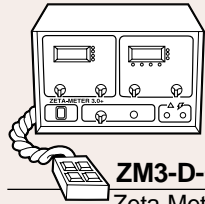
It also includes many other features and items. See our Price List for complete details.



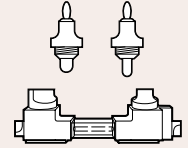
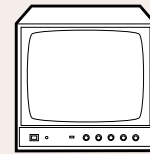
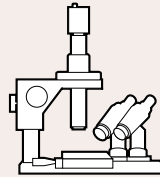
ZM3-U-G



Zeta-Meter System 3.0+ with Unitron Microscope & Type GT-2 Cell



ZM3-D-G



Zeta-Meter System 3.0+ with Direct Video Imaging & Type GT-2 Cell

Options & Accessories

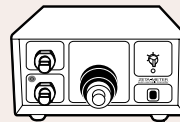
Next, select the options and accessories that you need. You can also order extra cells and electrodes.

Please contact us if you need any help.



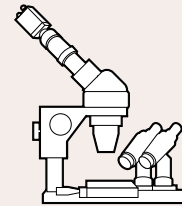
G204

Platinum Anode



A200

Automatic Sample Transfer



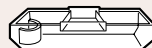
C203

Eyepiece Tube Video Display



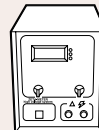
V100

Vertical Micrometer



T100

Temperature Control Bath



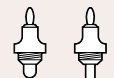
H200

High Voltage Power Supply



G201

Type GT-2 Cell



G202 & G203

Electrodes

Specifications

Sample Suitability

Our Zeta-Meter System 3.0+ can measure samples which fall within the following ranges:

- | | |
|---|------------------------------------|
| <input type="checkbox"/> Zeta Potential | -125 to +125 millivolts |
| <input type="checkbox"/> Electrophoretic Mobility | +20 to -20 microns/sec per volt/cm |
| <input type="checkbox"/> Specific Conductance | 0 to 60,000 microSiemens/cm |
| <input type="checkbox"/> Temperature | 5°C - 75°C |
| <input type="checkbox"/> Concentration | 10 mg/L to 80% solids by weight |
| <input type="checkbox"/> Particle Diameter | 1.5 to 100 microns (microscope) |
| | 0.5 to 50 microns (video display) |
| <input type="checkbox"/> Sample Size | 20 mL (standard cell) |
| | 5 mL (low volume cell) |
| <input type="checkbox"/> Suspending Medium | water or organic liquids |