



Shimadzu Scientific Instruments and Equipment

General Products Brochure



Best for our customers

Shimadzu Scientific Instruments and Equipment

Supporting the Needs of the Times

Relentlessly accelerating pace of the global economy means that the demands we all face are continuously evolving.

As a leading manufacturer of broad range analytical instruments, Shimadzu undertakes development of new instruments and technologies, provides comprehensive service support, and maintains a flexible attitude in order to keep up with changing customers' demands.

Contents	P8- Spectrophotometry	P28- Gas Chromatograph Mass Spectrometry	P37- Biotechnology Instruments
	P11- Spectrometry	P30- Gas Chromatography	P41- Water Quality Analysis
	P13- X-ray Analysis	P33- Data Processors and Software	P43- Environmental Gas Analysis
	P15- Surface Analysis	P34- Thermal Analysis	P44- Weighing Equipment
	P16- Liquid Chromatography	P36- Life Science Instruments	P47- Particle Property Analysis

Evaluation Instruments for Pharmaceutical Products

Support from drug discovery to quality control

Shimadzu offers extensive support for proteomics, genomics, metabolomics and other life science research products as well as chromatograph, mass spectrometer, and properties testing instrument.

Shimadzu provides instruments for analysis and services for quality control, including IQ/OQ and supports for regulatory, to meet today's demands for safe pharmaceutical manufacture.

Biological Polymer Analysis and Biotechnology Instruments



AXIMA Series
MALDI-TOF Mass Spectrometer



MCE-202 MultiNA
Microchip Electrophoresis System

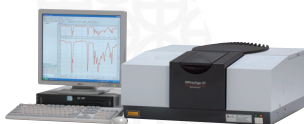


BioSpec-nano
Life Science Spectrophotometer

Component Analysis Instruments



LCMS-2020
High-Performance
Liquid Chromatograph
Mass Spectrometer



IRPrestige-21
FTIR Spectrophotometer

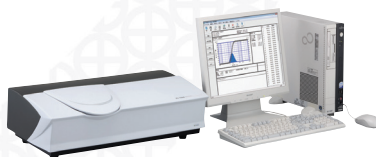


AA-7000
Atomic Absorption
Spectrophotometer



EDX Series
Energy Dispersive
X-Ray Fluorescence Spectrometer

Physical Property Analyzers and Materials Testing Machines



IG-1000
Single Nano Particle Size Analyzer



DSC-60
Differential Scanning Calorimeter

Evaluation Instruments for Foods

The Science of Food...

Food products must taste good but they also require unceasing efforts to maintain safety and reliability. Inspection, analysis and evaluation instruments play a major role in this process.

Shimadzu instruments assist in satisfying the sophisticated and strict food safety requirements at all manufacturing and inspection stages.

Analysis of Harmful Components and Additives

Residual Pesticides

Veterinary Pharmaceuticals

Food Additives

Mycotoxins

Toxic Metals



Prominence
High-Performance
Liquid Chromatograph



LCMS-2020
High-Performance Liquid Chromatograph
Mass Spectrometer



GCMS-QP2010 Plus
Gas Chromatograph -
Mass Spectrometer



AA-7000
Atomic Absorption Spectrophotometer

Foreign Matter Inspection and Analysis



IRPrestige-21
FTIR Spectrophotometer
Infrared Microscope System



EDX Series
Energy Dispersive X-Ray Fluorescence Spectrometer

Packaging Materials / Packaging Control



GC-2010
Capillary Gas Chromatograph

Evaluation of Food Production Origin and Authentication



MCE-202 MultiNA
Microchip Electrophoresis System

Instruments for Life Science Research

Toward Discovery of Novel Life Sciences

Shimadzu continually provides leading-edge instrument to support genetic and protein research. For example, Shimadzu mass spectrometers for the identification of proteins boast world-leading analytic capacity and provide a total system to support research from the pretreatment stage. Shimadzu aims to further develop current technologies to contribute to disease diagnosis and other next-generation medical treatments by identifying abnormalities in the marker proteins contained in minute samples of blood.

Proteome

Separation, Purification, and Quantitation



2D Micro-HPLC Prominence System for Proteome Analysis

Identification, Characterization and Expression Analysis



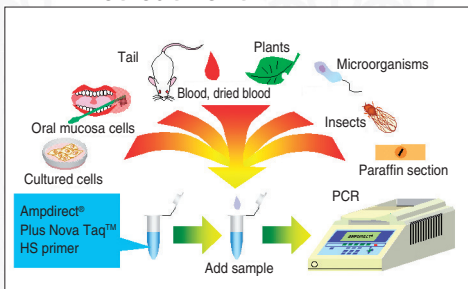
AXIMA Series MALDI-TOF Mass Spectrometer



PPSQ-31A/33A Protein Sequencing System

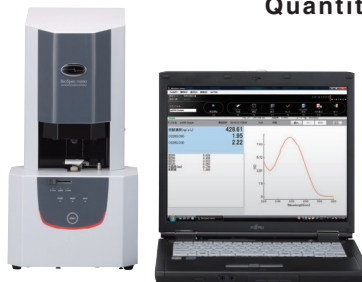
Genome

DNA Pretreatment



Ampdirect® Plus DNA Amplification Reagent

Quantitation



BioSpec-nano Life Science Spectrophotometer

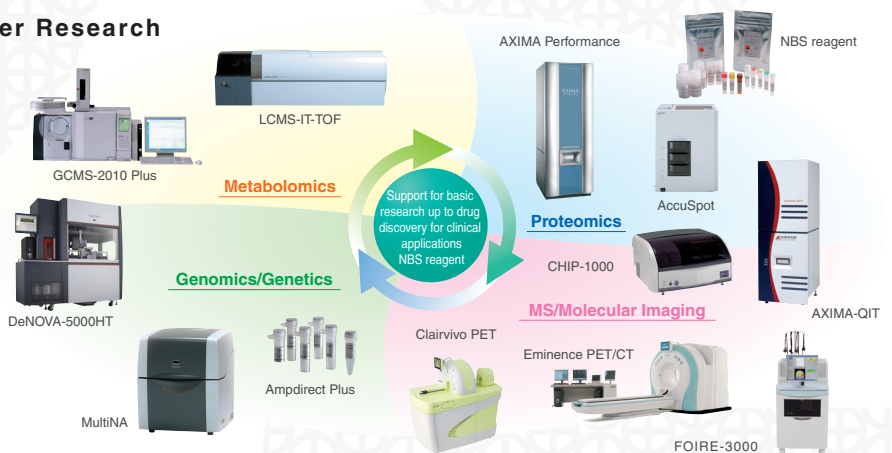


MCE-202 MultiNA Microchip Electrophoresis System

Biomarkers

Shimadzu Products for Biomarker Research

Shimadzu fully exploits its extensive analytical technologies – from genomics, proteomics, and metabolomics to leading-edge molecular imaging – to supply the optimal tools and provide powerful support for leading-edge biomarker researchers.



Evaluation Instruments for Fuel Cells

Developing the Dream Power Source of the Future

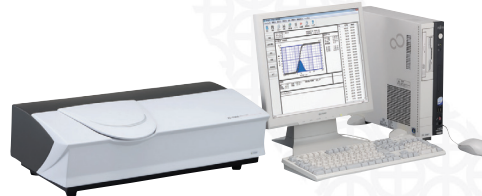
Shimadzu's speciality is analytical technologies. Shimadzu supplies not only gas analyzers for the analysis of impurities in fuels and intermediate and final products, but also instruments to evaluate catalysts and electrolytic membranes, and various other instruments for elemental analysis, shape observations, and internal observations.

- * Analysis of impurities in reformed gas → GC, transportable gas analyzer
- * Analysis of impurities in direct fuel cells → Ion chromatograph (IC), LCMS
- * Catalyst particle size distribution → Nano particle size analyzer
- * Element mapping → EPMA
- * Elemental analysis of metal catalysts → EDX
- * Analysis of trace by-products on cathode electrode → GCMS, LCMS, ICP-MS
- * Composition analysis of exhaust gas → GC
- * Inorganic ion analysis of effluent → Ion chromatograph (IC)
- * Materials analysis, qualitative analysis of foreign matter → FTIR
- * Bound water analysis → DSC
- * Shape observations → SEM, SPM

CGT-7000
Infrared Gas Concentration Analyzer



IG-1000
Single Nano Particle Size Analyzer



Evaluation Instruments for Photovoltaic (PV) Cells

Multifaceted Support for New Research

Research has long been conducted into photovoltaic cells to convert the unlimited energy from the Sun into electricity in pursuit of the ultimate energy supply. Various types are available, including conventional crystalline silicon cells, thin-film silicon cells, compound solar cells, and dye-sensitized solar cells, and development will continue into the future.

Shimadzu's comprehensive lineup of instruments for analysis, testing, and evaluation provide multifaceted support for research and development into a wide range of photovoltaic cells and for maintaining the reliability and safety of photovoltaic cells.

Instruments to Evaluate Cell Processes

Crystalline Si

Thin-film Si

CIS/CIGS/CdTe thin film

Dye-sensitized / organic thin films

EPMA-1720
Electron Probe Microanalyzer



SolidSpec-3700/3700DUV
UV-VIS-NIR Spectrophotometer



UV-VIS Spectrophotometers



UVmini-1240 UV-VIS Spectrophotometer

Lightweight with a small footprint, the UVmini spectrophotometer is equipped with a large-sized graphic liquid crystal display. Features include versatile quantitative methods including simple factor method, multipoint calibration curve, two to three wavelengths quantitative analysis and personal experimental parameters to be stored in an IC card. A new UV data manager, with the UVmini connected to a PC via standard RS-232C, allows users to store and organize data files in a memory of a screen copy printer or a variety of different PC printers.

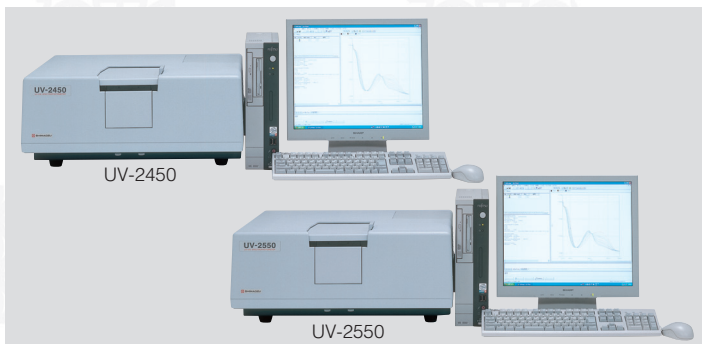


UV-1800 UV-VIS Spectrophotometer

The UV-1800 uses the Czerny-Turner mounting for its monochromator, and boasts the highest resolution in its class*, a bright optical system, and a compact design. Available as either a stand-alone instrument or a PC-controlled instrument, the UV-1800 is USB-memory ready, which enables users to save measurement data to highly versatile USB memory, and perform data analysis and printing using a PC.

*As of March 2007, according to Shimadzu survey

- Spectral bandwidth: 1 nm (190 to 1,100 nm)
- Dimensions: 450 (W) x 490 (D) x 270 (H) mm

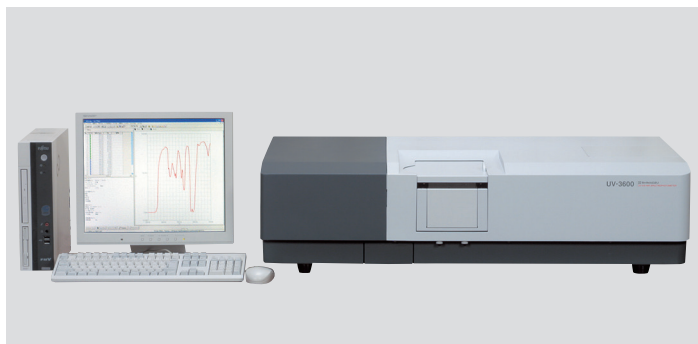


UV-2450, UV-2550 UV-VIS Spectrophotometers

The UV-2550 is a top-of-the-line spectrophotometer with a double monochromator and exceptionally low stray light and a high S/N ratio. The UV-2450 is an economy version with a single monochromator. Microsoft® Windows™-based software ensures ease of use and its conventional cut-and-paste function allows easy conversion of measured results to commercially available data processing and spreadsheet software.

Measurable wavelength range : 190 ~ 900nm (with special detector, 1100nm is possible)

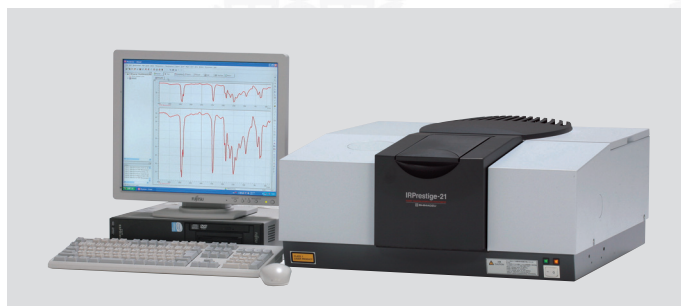
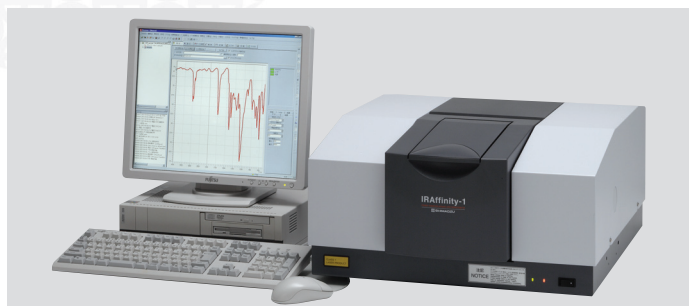
- Stray light : UV-2450 : less than 0.015%
(UV-2550: less than 0.0003%) at 220nm and 340nm



UV-3600 UV-VIS-NIR Spectrophotometer

The UV-3600 is a new model in our lineup of high-end UV-VIS-NIR spectrophotometers. Equipped with 3 detectors, the UV-3600 ensures high sensitivity over the entire measurement wavelength range. With a high-performance double monochromator, ultra-low stray light (0.00005% or less at 340 nm) is achieved at high resolution. With a measurement wavelength range of 185 - 3300 nm, the UV-3600 is applicable to spectroscopic analysis in a wide variety of fields.

Infrared Spectrophotometers



IRAffinity-1 / IRPrestige-21 **Fourier Transform Infrared Spectrophotometers**

Both the IRAffinity-1 and IRPrestige-21 are PC-controlled Fourier transform infrared spectrophotometers operating under the Microsoft® Windows XP™-based IRsolution software. IRsolution software provides outstanding ease of use with a high level of processing functions such as ATR correction, Kramers-Kronig analysis, quantitation using multilinear regression, and spectral search, as well as spectrum subtraction and peak pick. For GLP/GLM and FDA 21 CFR Part 11 compliance, a validation program is provided as standard as is an Electronic signature function, security and log function, and automatic recording of processing history in a file. Three-dimensional processing and curve fitting are available as options. Excellent, high stability is ensured by the completely sealed interferometer, FJS (Flexible Joint System), and dynamic alignment mechanism. The IRPrestige-21 is a research-grade FTIR with an expandable measurement range from Near IR to Far IR and a S/N ratio of 40,000:1. Reliable measurement is possible even of gas samples. The IRAffinity-1 is an economy model ideal for R & D and for routine analysis with a S/N ratio of 30,000:1.

IRAffinity-1

- Detector: DLATGS (Deuterium L-alanine Triglyceride Sulfide)
- Signal-to-noise ratio: Greater than 30,000 : (around 2,100cm⁻¹)
- Wavenumber range: 7800cm⁻¹ to 350cm⁻¹

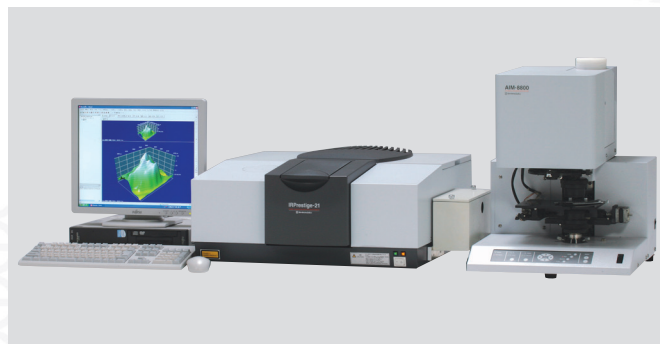
IRPrestige-21

- NIR/MIR/FIR (12,500cm⁻¹ ~ 240cm⁻¹)(Optional)
- Automatic Accessory Recognition
- Signal-to-noise ratio : 40,000:1 or better (around 2,100cm⁻¹)



SolidSpec-3700/3700DUV **UV-VIS-NIR Spectrophotometers**

Shimadzu's SolidSpec-3700/3700DUV is a top-of-the-line spectrophotometer with high sensitivity, deep UV measurement and a large sample compartment. The SolidSpec-3700/3700DUV responds to the requirements in optical, semiconductor and FPD applications by incorporating an integrating sphere and three detectors – photomultiplier (UV-VIS), InGaAs (NIR), and cooled PbS (NIR). The sample compartment accommodating large samples up to 700 x 560 x 40 mm and innovative three-dimensional optical system (patent pending) allow transmission and reflection measurements of horizontally loaded large samples. SolidSpec-3700DUV's wavelength range is from 175nm (from 165 nm with optional direct detection unit) to 3300nm.



AIM-8800 **Infrared Microscope**

The highly efficient reflecting objective mirrors and an optimal optical system featuring aspherical mirrors ensure high sensitivity. Stage movements, aperture settings, and focusing can be controlled from a PC screen for exceptional ease of use.

Atomic Absorption Spectrophotometers



AA-7000F/7000G Atomic Absorption Spectrophotometer

AA-7000 Series instruments are highly advanced atomic absorption spectrophotometers. The optical double-beam system enhances sensitivity and stability to achieve a top-class minimum limit of detection. Two types of background correction methods (D_2 , SR) are available. Dual Atomizer System offers automatic flame/furnace switching. AA-7000 has the smallest installation footprint in the class and are first instruments in the world fitted with a vibration sensor to improve safety. The system can be expanded to suit the requirements and can be configured to achieve the sensitivity required.

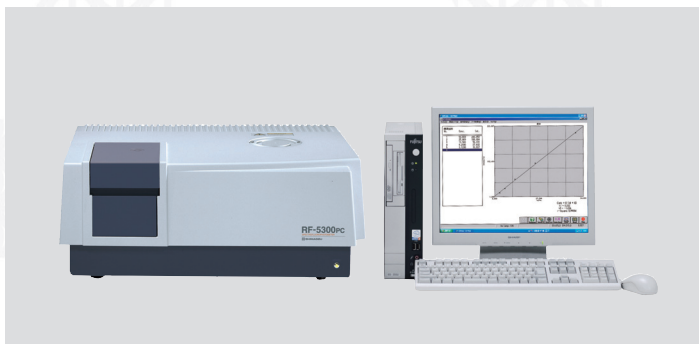
- Measurement wavelength range : 185 to 900 nm
- Background correction method : D_2 or SR method selectable
- Accuracy management : QA/QC functions
- Photometric mode : Optical double-beam photometric system
- Atomizer : Dual atomizer (automatic flame/furnace switching)
- Hollow-cathode lamp : Six lamps, automatic setup



AA-6200 Atomic Absorption Spectrophotometer

The AA-6200 is a completely PC-controlled Atomic Absorption Spectrophotometer featuring easy-to-use Windows XP software with the Wizard function, double-beam optics, and D_2 background correction. The AA-6200 uses the least linear bench space of any Atomic Absorption Spectrophotometer in the world.

Spectrofluorophotometer



RF-5301PC Spectrofluorophotometer

The RF-5301PC is a PC-controlled spectrofluorophotometer incorporating Microsoft® Windows™ based software. The software provides an easy-to-use GUI (Graphical User Interface) environment and supports DDE (Dynamic Data Exchange) that enables seamless transfer of measured spectra to other application software for convenient report generation. The RF-5301PC exhibits a signal-to-noise ratio of more than 150 as a result of the relentless pursuit of sensitivity, which is the most important aspect for the spectrofluorophotometer.

Emission Spectroscopic Apparatus



ICPS-7510 Sequential Plasma Spectrometer

A vacuum sequential plasma spectrometer that ensures high resolution over a wide wavelength range and features ease of operation, high stability, and a wide range of applications. The profile curve checking software, which is provided as standard, includes a program for checking the reliability of a particular analytical line, such as influence of matrix effects. A wide variety of options includes Automatic Sampler, UAG-1 Ultrasonic nebulizer, and various nebulizers and torches.



ICPS-8100 Twin Sequential ICP Emission Spectrometer

An ICP Emission Spectrometer boasting high speed and high resolution. The twin sequential monochromators enhance the speed to yield semi-quantitative values in approximately three minutes for the qualitative analysis of 72 elements.

The analysis of metal, rare earths, and soils require high wavelength resolution.

ICPS-8100 achieves unparalleled ultra-high resolution of 0.0045 nm. Batch analysis from ppb to percent levels offers easy analysis from principal components to trace elements.

- No. 1 monochromator, No. 2 monochromator : Focal distance 1 m
- Measurement wavelength range : 160 to 850 nm
- Resolution : 0.0045 nm
- High frequency power supply : 27.12 MHz 1.8 kW max.



ICPE-9000 Multitype ICP Emission Spectrometer

This system offers both high throughput and easy analysis. Selecting spectral lines or processing large amounts of data, which was a problem with previous multitype ICP systems, is no longer necessary. The software includes various "assistant" features that allow anybody to perform accurate analyses in a short time.

- Light source: Axial viewing, mini-torch compatible
- Monochromator/Detector: Echelle, CCD
- Measurement wavelength range: 167 nm to 800 nm (using vacuum monochromator)
- Various "assistant" features make analyses easy to perform



ICPM-8500 Inductively Coupled Plasma Mass Spectrometer

The ICP-MS is capable of highly sensitive, speedy analysis of multiple elements, qualitative analysis, and isotope analysis. Because a quadrupole sequential system is used in the mass spectrometer, it has been made very compact.

- Analysis unit: Quadrupole mass spectrometer
Main rod: Molybdenum hyperbolic rod
Pre-rod: Molybdenum cylinder rod
- Detector unit: Channeltron detector
- Mini plasma torch, Coaxial type nebulizer

Emission Spectroscopic Apparatus



PDA-7000 Series **Optical Emission Spectrometer**

Emission spectrometry enables rapid and accurate simultaneous determination of many elements in metals. This technique has been adopted as a standard method for metals analysis. The Shimadzu PDA series is a high-performance optical emission spectrometer, utilizing the PDA (Pulse Distribution Analysis) method as standard, which enhances the accuracy and reliability of analyses. The PDA method, combined with excellent hardware quality, makes the PDA series suitable for any application in metals analysis. It enhances analysis productivity in quality control and process control in the ferrous and non-ferrous metals industries.

- Focal length : 600mm
- Grating : 2400 grooves/mm
- Reciprocal dispersion : 1st order : 0.69nm/mm
2nd order : 0.34nm/mm
- Effective wavelength range : 121-589nm



OES-6000 **Optical Emission Spectrometer**

The OES-6000 offers all the features of the PDA series. The extended focal length with wider wavelength coverage and higher dispersion makes it far more suitable for determination of trace elements and multiphase applications extension.

- Focal length : 1200mm
- Grating : 1667 grooves/mm
- Reciprocal dispersion : 1st order : 0.50nm/mm
2nd order : 0.25nm/mm
- Effective wavelength range : 121-678nm

X-ray Spectroscopic Apparatus



XRD-6000 X-Ray Diffractometer

Based on a design concept for ease of operation and multifunctionality, the XRD-6000 provides a vertical type of goniometer and software running on Windows environments.

Main specifications :

- X-ray tube : 2kW, Cu, NF type (standard), Cr, Fe, Co, Mo, W (optional) (3kw type is also available)
- Goniometer : Vertical type, 185mm (radius), 0.002°(2theta), 0.001°(theta) (minimum step angle)



XRD-7000 (S type/L type) X-Ray Diffractometer

The XRD-7000 provides a Theta-Theta Goniometer, making it more capable for huge samples and various kinds of optional attachments. Based on Windows environments, the XRD-7000's software is more stable and has a high security system.

- X-ray tube : 2kW, Cu, NF type (standard), Cr, Fe, Co, Mo, W (optional) (3kw type is also available)
- Goniometer : Theta-Theta
200 to 275mm (radius)
0.0001°(theta)
(minimum step angle)
- Max Specimen Size : 400mm dia x 400mmH (Ltype)
150mm dia x 400mmH (Stype)



EDX-GP Energy Dispersive X-Ray Fluorescence Spectrometer Support for RoHS/ELV Screening

The combination of software that includes automatic calibration curve selection and automatic measuring time reduction with hardware featuring a large sample chamber creates an instrument that offers the optimal functions and performance for RoHS/ELV toxic element screening analysis.

Anyone can easily operate the instrument from day one.

- Detected elements : ¹³AL to ⁹²U
- Sample chamber dimensions : W 370 x D 320 x H 155 mm max.
- X-ray filters : 5 types + open, automatic replacement



EDX Series Energy Dispersive X-Ray Fluorescence Spectrometer

- Simultaneous measurement of Carbon*-Uranium can be obtained at a touch of a button. (*EDX-800HS)
- A large sample chamber with an automated opening and closing door system allows Liquid, Solid, Powder, and even a 300mm Wafer sample to be analyzed.
- Powerful and flexible software based on Windows XP®
- Detectable element range : EDX-720/900HS Na-U
EDX-800HS C-U
- EDX-900HS : requires no liquid N₂
- Sample size : 300mm dia x 150mm height (max.)

X-ray Spectroscopic Apparatus



μEDX Series Energy Dispersive Micro X-Ray Fluorescence Spectrometer

The MicroEDX series, which cooperates with polycapillary X-ray lens, achieves high sensitivity and high-resolution analysis in a small point of a 50 micro-meter diameter. Pinpoint target is realized by a dual CCD camera system and a precisely controlled motorized sample stage. Powerful software features include standardless FP quantitation and Auto mapping diverse analysis. Transmission X-ray images can be observed with an optional kit.



XRF-1800 Sequential X-Ray Fluorescence Spectrometer

The XRF-1800 provides local analysis and 250 μ m mapping capabilities as standard features, enabling reliable analysis of a local area, only a 0.5mm in diameter in the wavelength dispersive method. More than a 30% sensitivity improvement compared with a conventional 3kW X-ray tube is achieved through the use of a 4kW X-ray tube with a thin window.

- Elements to be determined :
 - ${}^8\text{O} \sim {}^{92}\text{U}$ with LiF, PET, Ge and TAP analyzing crystal
 - ${}^4\text{Be} \sim {}^7\text{N}$ with optional analyzing crystal
- X-ray tube : 4kW with a thin window
- 250 μ m Mapping resolution as standard



MXF-2400 Multi-Channel X-Ray Fluorescence Spectrometer

The MXF-2400 features a compact design and ease of operation. A maximum of up to 36 elements can be simultaneously determined (depends on configuration).

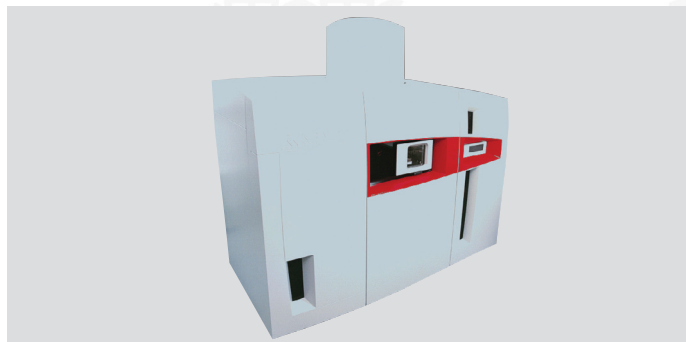
- Elements to be determined : ${}^5\text{B}$, ${}^6\text{C}$, ${}^7\text{N}$, ${}^8\text{O} \sim {}^{92}\text{U}$
- Converging system : Curved crystal
- X-ray tube : 4kW with a thin window

Surface Analysis Apparatus



EPMA-1720/1720H Electron Probe Microanalyzer

The Electron Probe Microanalyzer (EPMA) allows highly sensitive analysis of elements in micron-scale regions on the sample. The fully digital control system offers revolutionary observation and analysis operations using only the mouse and keyboard. It can also be operated from a networked PC. EPMA-1720H incorporates a high-performance CeB6 filament that allows EPMA analysis of sub-micron regions.



AXIS-NOVA KRATOS XPS Imaging Spectrometer

The Micro XPS instrument significantly automates the stages from introducing the sample to starting analysis. The analysis position can be rapidly assigned to any point on the 110 mm-diameter sample platen from a CCD camera image or realtime photoelectron image. The revolutionary, patented charge neutralization method produces high-resolution spectra with no damage to the sample, thereby allowing micro analysis of organic matter that was conventionally difficult.

- Image resolution : 3 μm max.
- Sensitivity : (monochrome X-rays, 0.48 eV FWHM)
 - Macro analysis: 250 kcps
 - 15 μm dia. analysis: 0.8 kcps



AXIS-ULTRA KRATOS XPS Imaging Spectrometer

This revolutionary imaging XPS incorporates a newly developed hemispherical analyzer to produce micron-scale, high-resolution element images and chemical state images in just a few seconds or tens of seconds.

Simply designate the analysis position by clicking on the image to perform multi-point spectral analysis over a minute area (15 μm dia. min.) without moving the sample.

- Image resolution : 3 μm max.
- Sensitivity : (Mg X-rays, 1.0 eV FWHM)
 - Macro analysis 9,200 kcps, 27 μm dia, 100 kcps (monochrome X-rays, 0.48 eV FWHM)
 - Macro analysis 250 kcps, 27 μm dia, 3 kcps



SPM-9600 Series Scanning Probe Microscope

The Scanning Probe Microscope (SPM) can make high-magnification observations by scanning a microscopic probe over the surface of a sample and detecting certain interactions between the probe and the sample surface with easy operation, leading to higher-quality Images. Interaction means atomic force, current, magnetic force, surface potential, and lateral force.

Metals, semi conductors, ceramics, organic matter, high molecular weight polymers, as well as biological samples can be visualized without initial coating, with surface features displayed at magnifications up to millions fold. The SPM-9600 series can be upgraded to the environment-controlled scanning probe microscope WET-SPM series by adding the optional environmental-controlled chamber.



WET-SPM Series Environment-Control Scanning Probe Microscope

Permits SPM observations in a controlled environment.

The environment-controlled chamber with a large viewport and twin gloves permits all types of pretreatment in a fully controlled environment. It offers in-situ SPM observations of changes to a sample due to fluctuations in factors such as temperature, humidity, pressure, light quantity, and concentration. (Japan and US Patented)

- Glove ports : 2 (both arms)
- Pumps : Rotary pump, turbomolecular pump (option)
- Vibration isolation : Internal air-spring damper

Liquid Chromatographs



Prominence UFLC **Ultra Fast Liquid Chromatograph**

Until now, even though ultra-fast speeds were achieved according to column theory, ultra-fast LC could not simultaneously maximize both speed and separation. However, after thoroughly analyzing the cause behind this obstacle, we were finally successful in achieving an ultra-fast LC system with outstanding precision and durability that offers both speed and separation without being dependent on high pressure. Prominence UFLC offers speed, precision, and expandability.



Prominence Series (LC-20A Series) **High Performance Liquid Chromatograph**

This network-compatible modular HPLC offers the performance and functionality demanded in today's age, including Web control, fast sample-injection operations, high detector sensitivity, and full automation. It allows control, monitoring, and maintenance not only from a LC workstation but from any networked client PC running Microsoft Internet Explorer via the CBM-20A. Precise solvent delivery in the low flow rate range and near-zero sample carryover performances make the Prominence an ideal front-end for LC-MS.



Prominence UFLCxR Ultra Fast Liquid Chromatograph

Prominence UFLCxR is a new type of high performance liquid chromatograph that offers both ultra-fast analysis and ultra-high separation levels while still offering the same fundamental performance of the highly reputed Prominence series. Since it also allows performing conventional high performance liquid chromatography using a long column, this means it can accommodate a wider range of high-speed and high-separation applications.

System Pressure Capacity Increased to 66 MPa

Increasing the maximum allowable pressure capacity of the system from 35 MPa (for Prominence UFLC models) to 66 MPa (for Prominence UFLCxR models) made it possible to reduce analysis times and achieve ultra-high separation. It also allows fast analysis even when highly viscous mobile phases are specified. This means a wide range of applications can be analyzed more rapidly.

Outstanding Fundamental Performance that Provides Highly Precise Analytical Results

Due to its exceptional core performance capabilities, such as the high precision levels, with area repeatability RSD values below 0.3% for microinjection, and low carryover, even when analysis involves high system pressures over 60 MPa, and due to its ability to achieve ultra-high separation, Prominence UFLCxR is able to provide higher-quality HPLC data.



Prominence nano Nanoflow Liquid Chromatograph

Prominence nano is a new nano-flow liquid chromatograph capable of high-sensitivity analysis required in the field of proteomics, where proteins are exhaustively analyzed. With outstanding flow rate precision, even at nano-level flow rates, it offers excellent retention time repeatability, which is especially useful when used as a front end HPLC unit for LC-MS.

New Reflux Flow Control System

When delivering solvent at extremely low flow rates, it is important that the solvent flow is stable and solvent consumption is minimal. The LC-20ADnano pump in the Prominence nano system uses a signal from a high-precision temperature-controlled nanoflow sensor for feedback control (Reflux Flow Control) to ensure the solvent flow rate is always accurate and significantly reduce the consumption of solvent.

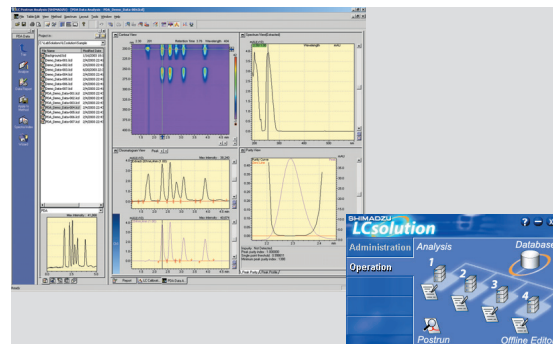
Outstanding Retention Time Repeatability

Thanks to high-precision levels of 0.2% or less RSD for retention time repeatability at 300 nL/min, this system provides highly reliable data, such as for comparing peaks in differential analysis between samples.

Easy to Operate Using Specialized Nano-Assist Control Software

The Nano-Assist software used to control Prominence nano systems features a graphical user interface that makes it easy to control even two-dimensional systems. It allows visual confirmation of analytical condition settings, current mobile phase delivery status, and other information to help ensure the systems are operated properly.

Liquid Chromatographs



LC-2010HT High-throughput HPLC

The LC-2010HT is a next-generation HPLC based on the concept of high-throughput analysis and validation automation. The LC-2010HT is comprised of a degassing unit, low-pressure gradient unit, pump unit, mixer, auto sampler, column oven and UV-VIS detector. System reliability has been improved by standardizing the line arrangement in order to integrate units. Further improvements to method transfer have been achieved by the preeminent flow rate accuracy, gradient concentration accuracy and reduction of equipment line capacity. The LC-2010HT comes in two types: the standard model (LC-2010HTA) and the sample-cooler-added model (LC-2010HTC), for use across a broad range of applications, from conventional liquid chromatography to semi-micro liquid chromatography.

LCsolution Workstation for Shimadzu HPLC

Shimadzu's LCsolution software offers an intuitive easy-to-use operating environment and sets a new standard for laboratory productivity in the 21st century by offering new and innovative solutions to meet the challenges of high sample throughput, instrument control, diverse data handling, and integration with regulatory compliance. Shimadzu's new LabSolutions workstation unifies data acquisition and management across all types of chromatographic instruments. The operating environment for chromatography applications is standardized with the common user interface which provides for improved productivity of your analysis.



LC-20AD Prominence Series Solvent Delivery Unit

The LC-20AD is an isocratic solvent delivery unit that delivers optimal pumping performance. The automatic pulsation compensation mechanism and high-speed microplunger drive combine to achieve pulse-less liquid feed. Pumping performance in the microflow range below 50 $\mu\text{L}/\text{min}$ is enhanced. A low-pressure gradient unit can be installed to make a compact gradient HPLC system.

Pump type: Parallel double microplunger
Flow rate range: 0.0001 to 10.0000 mL/min



LC-20ADXR Prominence UFLCxr Solvent Delivery Unit

Retains the excellent basic functions developed in the LC-20AD, with modifications of the pressure sensor, drain valve, and plunger seal added to expand the maximum allowed pressure to 66 MPa for extra-resolution applications under such high pressure.

Pump type: Parallel-type double plunger
Flow-rate range: 0.0001 to 3mL/min (1.0 to 66MPa)
3.0001 to 5mL/min (1.0 to 44MPa)



**LC-20ADnano
Prominence nano
Solvent Delivery Unit**

The LC-20ADnano employs a new Reflux Flow Control system to offer stable solvent delivery and low solvent consumption, without splitting waste solvent after the two solvents are mixed in concentration gradient analysis.

Pump type: Reflux flow control

Flow rate range: 1 to 5 nL/min

(controlled independently)

0.01 to 5 µL/min

(using Nano-Assist)

0.1 to 5 µL/min

(using CBM-20A and LCsolution)



**LC-20AT
Prominence Series
Solvent Delivery Unit**

The LC-20AT is a solvent delivery unit that maintains high performance while improving the ease of maintenance. Re-designed pump-head construction and flow paths improve bleeding of air bubbles. A low-pressure gradient unit can be installed to make a compact gradient elution system.

Pump type: Serial double microplunger

Flow rate range: 0.001 to 10.000 mL/min



**LC-20AB
Prominence Series
Solvent Delivery Unit**

The LC-20AB is a binary high-pressure gradient solvent delivery unit incorporating two pumps. This achieves space-saving cost-performance and permits binary gradients with small delay volume.

Pump type: Parallel double microplunger (2 sets)

Gradient type: Binary, high-pressure mixing

Flow setting range: 0.0001 to 10.0000 mL/min



**LC-10Ai
Inert Solvent Delivery Unit**

The LC-10Ai inert solvent delivery unit employs PEEK (Polyetheretherketone) resin for the liquid contact parts. It safely handles bioactive substances and concentrated sodium chloride.

Flow rate range:

0.001 to 5 mL/min (0.1 to 27.4 MPa)

5.001 to 9.999 mL/min (0.1 to 19.6 MPa)



**LC-8A/LC-6AD
Preparative Solvent Delivery Unit**

The LC-8A is a highly reliable, large-volume solvent delivery unit for large-volume preparation with columns from 2 to 5 cm ID. Can be used for purity investigations and for investigating scale-up conditions based on the analytical column size.

Flow rate range: 0.1 to 150 mL/min

The LC-6AD handles a wide range of flow rates, from high-sensitivity analysis to semi-preparative analysis. An optional recycle kit makes the unit ideal for semi-preparative analysis.

Flow range: 0.001 to 5 mL/min (0.1 to 49 MPa)

5.001 to 20 mL/min (0.1 to 24.5 MPa)

(Above picture is LC-8A.)



**SIL-20A/20AC/20AHT/20AHT
Prominence Series
Autosampler**

A direct injection type autosampler that permits high-speed, multisample processing. Near-zero sample carryover is realized, which makes the SIL-20A/20AC ideal for high-sensitivity LC-MSMS analysis. Connecting the optional rack changer allows continuous analysis by replacing up to 12 MTP/DWP.

Injection method: Direct sample injection
Injection volume: 0.1 to 100 µL (standard), 1 to 2000 µL (option)

Sample temperature control:

SIL-20A: none

SIL-20AC: 4 to 40°C

Liquid Chromatographs



SIL-20AxR/20ACxR Prominence UFLCxR Autosampler

We developed a new high-pressure valve to create a configuration consisting solely of a special coated housing top and a strengthened PEEK rotor, resulting in an expansion of the maximum allowed pressure to 66 MPa.

Injection method: Total-volume sample injection, variable injection volume

Injection-volume setting range: 0.1 to 50 μL (standard), 1 to 100 μL (option)



SIL-10AF/10AP/10Ai Autosampler with Sample Pretreatment Functions

Ideal for fixed-loop measured sample injection, injection of 500 μL or more, and automatic pretreatment.

Injection Method: Adjustable injection volume or fixed loop sample injection

Injection volume: 1 to 5000 μL (pretreatment function increases this by N times) (Optional equipment required for 150 μL or more.)

CBM-20A or SCL-10AVP is required for control.

Racks, vials, and cooler are sold separately.



SIL-HTA/SIL-HTc High Throughput Autosampler

High throughput is the key word for the modern HPLC analysis.

The SIL-HT is the highest performance autosampler in terms of sample injection speed, sample capacity, and minimizing sample carryover of highly adsorbent sample components. These techniques are in increasingly high demand and essential for analytical high throughput.

The SIL-HT was developed to meet such users' requirements. The SIL-HT is available in two versions: SIL-HTA without sample cooler, and SIL-HTC with sample cooler.



CTO-20A/20AC Prominence Series Column Oven

The CTO-20A/CTO-20AC are forced air circulation column ovens. A high-performance thermistor accurately regulates the temperature in the oven. Complex temperature programs can be set, including linear or stepwise heating and cooling. Optional sub-units can be contained in the unit, including manual injectors, a gradient mixer, and high-pressure flow line switching valves.

Heating and cooling type: Forced Air Circulation

Temperature-control range:

CTO-20A: (room temperature + 10°C) to 85°C

CTO-20AC: (room temperature - 10°C) to 85°C



CTO-10ASvP Compact Column Oven

A compact, low-cost column oven that offers cooling below room temperature. Can accept two manual injectors.

Heating and cooling method

Preheating and block heating

Temperature-control range:

(room temperature -15°C) to 80°C



CBM-20A/20Alite Prominence Series System Controller

The CBM-20A/20Alite is a communication bus module offering data buffering functions. It permits remote control and Web control, by acting as the interface between the PC and each unit. The CBM-20Alite is a card-type controller to be installed inside the Prominence modules.

Controlled units

CBM-20A: 8 (expandable to 12)

CBM-20Alite: 5

Inputs and outputs

CBM-20A: 4 inputs/4 outputs

CBM-20Alite: 2 inputs/2 outputs



**SPD-20A/20AV
Prominence Series
UV-VIS Detector**

These general-purpose UV-VIS detectors offer enhanced sensitivity and stability. Low noise, improved light-source compensation, and a temperature-controlled cell installed as standard achieve high sensitivity and stability. Stray light correction ensures an extremely broad linearity range.

Light source: SPD-20A: D₂ lamp

SPD-20AV: D₂ lamp, W lamp

Measuring wavelength range

SPD-20A: 190 to 700 nm

SPD-20AV: 190 to 900 nm



**SPD-20A/UFLC
Prominence UFLC**

The SPD-20A UFLC version has a semi-micro temperature controlled cell, which is factory installed and adjusted. Other specifications are the same as those of the SPD-20A.

Light source: Deuterium (D₂) lamp

Wavelength range: 190 to 700 nm



**SPD-M20A
Prominence Series
Photodiode Array Detector**

The SPD-M20A photodiode array detector (PDA) achieves high sensitivity that rivals a conventional absorbance detector. Linearity and stability are enhanced by comprehensive light-source compensation, stray light correction functions and temperature-controlled cells provided as standard.

Light source: D₂ lamp, W lamp

Measuring wavelength range: 190 to 800 nm



**RID-10A
Refractive Index Detector**

The RID-10A incorporates double temperature-controlled optics to enable fast instrument warm-up and to minimize baseline drift with respect to ambient temperature fluctuations. It ensures highly sensitive and stable analysis. The unique, 4-partition photodiode technology allows this single unit to handle applications from the analytical to the preparative.

Noise level: 0.25×10^{-8} RIU

Drift: 10^{-7} RIU/hr

Max. flowrate: 20 mL/min

(150 mL/min using option)



**RF-20A/RF-20Axs
Prominence Series
Spectrofluorometric Detectors**

The RF-20A and RF-20Axs offer world-leading levels of sensitivity thanks to a newly designed optical system. Fast sampling at 100 Hz supports UFLC. These detectors offer superb ease-of-maintenance, thanks to cell and lamp replacement at the front panel (that requires no positional adjustment), 2000-hour extra-long lamp life, and the VP functions. RF-20Axs is the only detector in the world that offers a temperature-controlled cell with cooling functions. It offers excellent peak area reproducibility with respect to room temperature fluctuations and further enhances the reliability of the analysis data.



**ELSD-LT II
Evaporative Light Scattering
Detector - Low Temperature**

The unique nebulizer and evaporation tube permit low-temperature operation. It is a powerful tool for the gradient analysis of compounds that cannot be analyzed by an absorbance detector.

- Stable, low-temperature evaporation of the mobile phase achieves high sensitivity and stability.
- Detects almost all compounds in the sample.
- Superb solvent elimination under gradient elution and rapid separation conditions.

Liquid Chromatographs



FCV nano Prominence nano Switching Valve

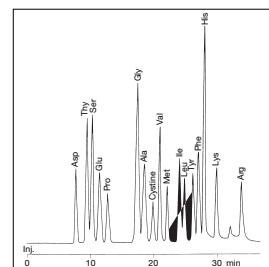
The FCV nano is ideal for configuring nano LC trap injection and 2-dimensional systems for nanoflow LC. By combining a surface-hardened stator and a reinforced PEEK (polyester ether ketone) rotor, it provides low adsorption of samples and high durability.

- Valve flow configuration: 6-port 2-position high-pressure valve
- Volume between ports: About 25 nL
- Pressure capacity: 20 MPa



Amino Acid Analysis System

Post-column fluorescence detection with OPA (ortho-phthalaldehyde) as a derivatizing reagent provides better sensitivity for the analysis of amino acids than the traditional ninhydrin method. N-acetylcysteine, an odorless solid, is used as a thiol agent (Japanese Patent No. 1567849). This method is easier to use than the conventional mercaptoethanol method, and provides the highly sensitive detection of amino acids such as proline.



Organic Acid Analysis System

Selectively detects organic acids with high sensitivity, using Shimadzu's unique pH buffering post-column electroconductivity detection technology (patented).

- Instruments Included in the Example Shown
SCL-10AvP, LC-20AD x 2 units, DGU-20A3, SIL-20AC, CTO-20AC, CDD-10AvP, LCsolution, and others.



Reducing Sugar Analysis System

Selectively detects reducing sugars with high sensitivity, using Shimadzu's unique post-column fluorescence detection technology (patented), which uses arginine as a reaction reagent. This system is ideal for analyzing reagents with high impurity levels or, by changing the reagent, analyzing non-reducing sugars.

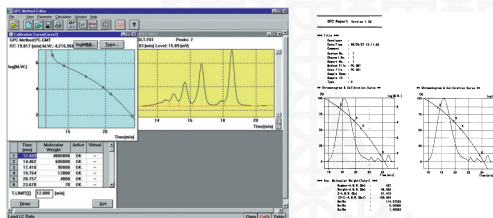
- Instruments Included in the Example Shown
CBM-20Alite, LC-20AB, LC-20AD, DGU-20A5, SIL-20AC, CTO-20AC, CRB-6A, RF-20Axs, LCsolution, and others.



Carbamate Pesticide Analysis System

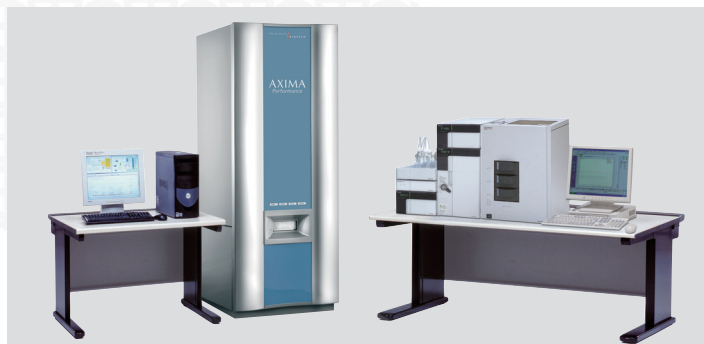
Post-column fluorescence detection system that analyzes n-methyl carbamate pesticides in agricultural products. Shimadzu's unique reaction unit provides highly sensitive and highly precise analysis.

- Instruments Included in the Example Shown
CBM-20A, LC-20AB, LC-20AD x 2 units, DGU-20As, SIL-20AC, CTO-20AC, CRB-6A, RF-20As, LCsolution, and others.



GPC System

This system measures polymer molecular weight with high accuracy. It includes user-friendly calibration curve creation, super-imposed display of charts, and ASCII data conversion. The molecular weight calculations incorporate retention time correction by internal standard, delay time correction between detectors, and sensitivity correction of the refractive index detector.



SEC (GPC)-AccuSpot-AXIMA System Polymer Analysis System

MALDI-TOF MS is commonly used for structural analysis and for evaluation of the physical properties of synthetic polymers. However, where multiple components are combined, mutual interference between the components inhibits ionization, resulting in detection of the major components only while the trace components are not detected at all. This problem can be overcome by SEC-MALDI-TOF MS, which pre-separates the multicomponent sample into components by size exclusion chromatography (SEC) before measurement by MALDI-TOF MS. This system conducts GPC separation, mixes the MALDI matrix solution, and spots the resulting solution onto the MALDI plate on-line. It permits highly sensitive detection of ultra-trace components in polymer materials and enhances the efficiency of analysis work.

- Major component units : AXIMA Assurance, CBM-20Alite, LC-20AD, DGU-20A3, 8125 Manual Injector, CTO-20AC, SPD-20A, AccuSpot, LCsolution, etc.



Large-Scale Preparative Chromatograph

Based on the LC-8A solvent delivery system, which is capable of delivering 0.1 mL/min to 150 mL/min, it can be configured with a wide variety of instruments depending on the application, such as five models of sample injectors, three models of recycle valves, two models of fraction collectors, and so on.

- Instruments Included in the Example Shown
CBM-20A, LC-8A x 2 units, SIL-20AP, SPD-20A, FRC-10A LCsolution, and others.

Liquid Chromatographs / Liquid Chromatographs - mass Spectrometer



Co-Sense for BA **Biological Sample Analysis System**

This system utilizes column-switching technology and unique pretreatment columns to analyze biological samples such as blood serum or blood plasma by direct injection. It eliminates complicated pretreatment processes and achieves dramatic increases in efficiency for life sciences research.



GPC Cleanup System **Automated Sample Pretreatment System** **for Pesticide Residue Analysis**

GC, GC/MS, and HPLC are used for the analysis of pesticide residue in agricultural produce. However, it is undesirable to inject the lipids and pigments contained in the sample into the analyzer. This system uses a GPC column to eliminate these impurity components and conduct automatic fractionation of the pesticide components.



Prominence HIC-SP **Ion Chromatograph**

By combining an advanced auto-suppressor with the system, it enables better performance of the ion chromatograph, making it possible to perform ultra-high-sensitivity ion analysis. This system can be easily upgraded to a concentration analysis system or a dual-flow analysis system.

- Instruments included in the Example Shown SCL-10AvP, LC-20ADSP, DGU-20A3, SIL-20A, HIC-20A Super, LCsolution, and others.



Prominence HIC-NS **Ion Chromatograph**

A simple and high-performance ion chromatograph that utilizes non-suppressor technology. It is provided with a highly sensitive conductivity detector controlled by a built-in microprocessor and features temperature control in two stages. It can be upgraded from a simple system to a fully automated system just by adding the necessary components. Suited for the analysis of environmental pollutants.

- Measurement sensitivity :
0.01 ~ 51,200 μ S/cm full scale
- Flow rate control range : 0.001 ~ 5mL/min



**PIA-1000
Personal Ion Analyzer**

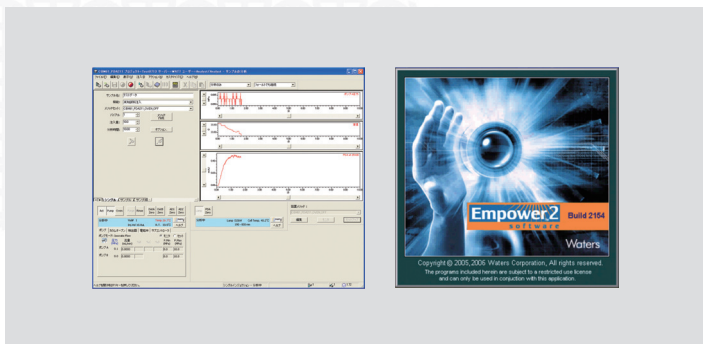
The PIA-1000 is a transportable ion analyzer that incorporates a solvent delivery unit, a manual sample injector, a column oven, a conductivity detector, a data processor with a floppy disk drive and a housing for elution and drain bottles in a 15kg (33lbs) lightweight compact transportable body.

The PIA-1000 is operated by either AC power supply or DC battery so that it can be installed anywhere as long as such power source is available. These features enable "On-site" analyses at a sampling location, or installation at a location with limited space.



**Co-Sense for LC-NMR/ LC-MS
Automated Sample Pretreatment
System for LC-NMR/LC-MS**

The Co-Sense Series is an automated sample pretreatment system designed to facilitate the processing of complex samples and augment the efficiency of NMR and MS measurements. HPLC column-switching technology is used to separate, purify and concentrate target compounds, and perform desalting and solvent replacement. This eliminates the bother and expense of performing such operations manually. Further, the separation of target compounds using HPLC is not limited by NMR and MS restrictions, allowing HPLC parameter selection as desired.



**Shimadzu LC Driver for Waters
Empower™ Chromatography Data System**

Control of Shimadzu's high performance liquid chromatograph by Waters' Empower / Empower2 chromatography data system is now available through a collaboration between Waters and Shimadzu utilizing the "Open Interface Portal (OIP)" for multi-vendor hardware control.

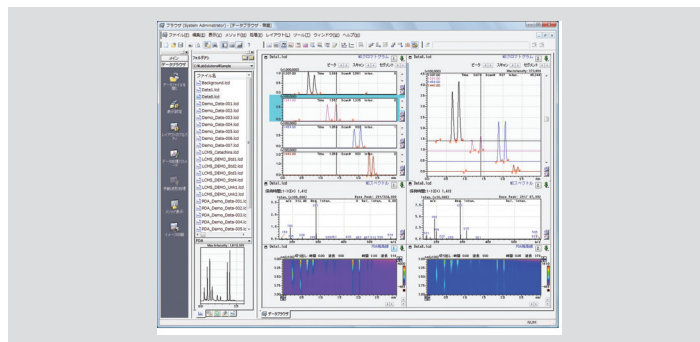
Shimadzu Prominence HPLC/UFLC and LC-2010HT series now seamlessly operates within the Empower software environment.



**CDD-10AVP
Conductivity Detector**

The dual-temperature control system and the bipolar detection circuit combine to provide exceptionally high sensitivity and stability, suitable for an ion chromatograph system or an organic acid analysis system.

Liquid Chromatographs - Mass Spectrometer



LCMS-2020 High-Performance Liquid Chromatograph Mass Spectrometer

LCMS-2020 is optimized for the Prominence UFLC/UFLC_{XR} Ultra Fast Liquid Chromatograph. Novel patent-pending technologies offer significantly enhanced scan speed and positive-negative ion polarity switching time, which are essential for UFLC, and simultaneously boost sensitivity. The instrument combines the excellent compound selectivity that is a feature of the mass spectrometer with significantly enhanced total productivity – from method development to analysis.

The LCMS-2020 plays a useful role in a range of fields, including the synthesis of compounds in the pharmaceutical and chemical industries.

- Mass range : m/z 10 to m/z 2000
- Sensitivity : ESI: reserpine 1 pg, S/N > 150 (RMS)
APCI: reserpine 1 pg, S/N > 100 (RMS)
- Resolution : $R = 2M$
- Scan speed : 15,000 u/sec
- Positive-negative ion polarity switching time : 15 msec

* Product does not include LC units.



LCMS-IT-TOF High Performance Liquid Chromatograph Ion-trap Time-of-flight Mass Spectrometer

This unique, tandem mass spectrometer combines an ion trap with a time-of-flight (TOF) mass spectrometer. The ion trap offers MSⁿ capacity (MS/MS, MS/MS/MS, MS/MS/MS/MS, ...) and the TOF provides high-resolution, highly accurate MS analysis capacity. Together, they offer the diverse analysis information required for effective structure analysis.

- Mass range MS: m/z 50 to 5,000
- Mass range MSⁿ: m/z 50 to 3,000
- Resolution: $R > 10,000$ at m/z 1,000 (FWHM)
- Precursor resolution: $R > 1,000$ at m/z 1,000

LCMSsolution Ver. 5 LCMS-2020 Workstation

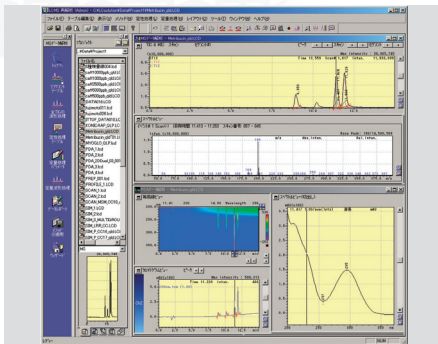
LCMS-2020 control and data processing are handled by the new LCMSsolution Ver.5 workstation. In addition to the enhanced Quantitation Browser multi-sample quantitative processing functions from the previous LCMSsolution Ver.3, Ver.5 offers comprehensive Data Browser functions for the qualitative processing of multiple data, which many users have requested. The Data Browser allows multiple data analyses such as peak detection and comparison of chromatograms and spectra on a single screen. By linking LC and MS data, it provides a powerful tool for identifying impurities and checking compounds. It expands on the established report functions to offer various printing formats.

* LCMSsolution Ver.5 can control the LCMS-2020 only. Note that it is not compatible with the LCMS-QP8000 Series, LCMS-2010 Series, or LCMS-IT-TOF. It can conduct data processing for the LCMS-2010 Series.



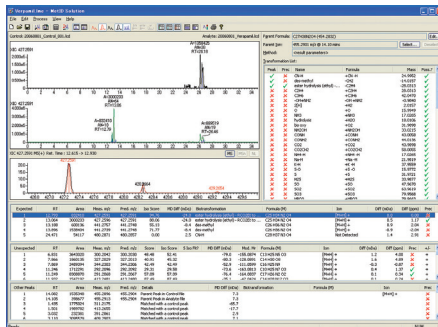
NES-100 Nano Electrospray Interface for LCMS-IT-TOF

Installed in LCMS-IT-TOF to enable analysis with nanoHPLC for analysis. Nano-spray enhances ionization efficiency and reduces losses. The NanoESI (Nano Electrospray Interface) achieves greater analysis sensitivity for ultra-trace samples. Can be removed in the same way as the standard ESI interface.



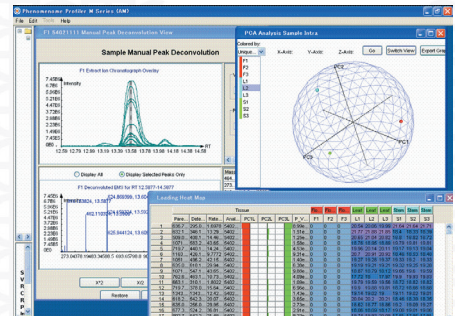
LCMSsolution Ver. 3 LCMS Workstation

This is one of the LabSolutions Series of workstations that standardizes the operations of Shimadzu chromatographs. Its ease-of-use and functionality have been considerably enhanced. LCMSsolution Ver. 3 is fully compatible with the LCsolution HPLC workstation and fully supports the Photodiode Array Detector. It offers powerful support for the LC user to use LC/MS as a LC detector. The dedicated Quantitation Browser enhances the efficiency of multi-sample LC/MS analysis.



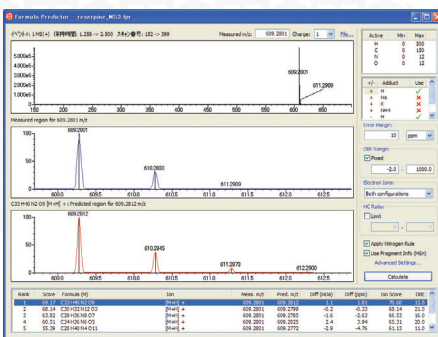
MetID Solution Metabolite Structural Analysis Software for LCMS-IT-TOF

This is LCMSsolution optional software for LCMS-IT-TOF. MetID Solution compares the pre-metabolized control sample and post-metabolized target sample data to identify metabolites. Unique multivariate analysis functions are applied to metabolites not expected in the metabolic pathway to acquire comprehensive metabolite candidate information.



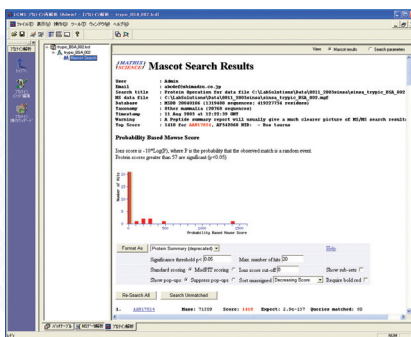
ProfilerTMAM+ Metabolomics Analysis Software for LCMS-IT-TOF

The ProfilerTM Series software from a Canadian company Phenomenome Discoveries Inc. uses multivariate statistical analysis for comparison and mining of analysis data from biological samples. It allows excellent identification of the metabolites having the greatest effect on biological variables from huge and complex biological sample sets. It can be used for an extensive range of applications, including biomarker searches, drug safety research, and composition analysis of foods.



Formula Predictor Software for LCMS-IT-TOF

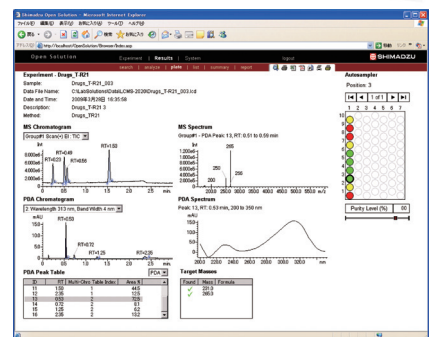
This is LCMSsolution optional software for LCMS-IT-TOF. The software offers more than formula predictions from calculated exact masses. It enhances the reliability of the results by narrowing down the number of candidates by comparing the candidate isotope patterns with measured ion isotope patterns, and uses functions (patent-pending) to narrow down the number of candidates by determining whether MS^{n-1} candidates for univalent and multivalent ions contain the MS^n predicted structure.



Protein Analysis Software for LCMS-IT-TOF

This is LCMSsolution optional software for LCMS-IT-TOF. It seamlessly combines with LCMSsolution. It is a power automation tool that uses the data acquired from the LCMS-IT-TOF/NanoESI unit to identify proteins by Mascot searches^{Note)} and display and manage the search results. The design that combines LCMS-IT-TOF high-speed data acquisition with automatic MS/MS functions permits the efficient handling of information from large numbers of samples.

Note) Mascot must be purchased from Matrix Science Ltd.



Open Solution Open Access-Compatible Software for LCMS/HPLC

This is LCMSsolution optional software for LCMS-2020. It offers simple and quick analysis operations by starting the analysis in just three steps and observing the results on a Microsoft Internet Explorer (IE) screen. If a networked environment is available, the results can be observed on Internet Explorer running on a PC, without the need for license fees or other additional investment. It is ideal for synthesis sections that share a single LCMS. In addition to LCMS systems, this software can be used with LC systems not incorporating LCMS.

Note) This software requires LCMSsolution Ver. 5.1.

Gas Chromatograph - Mass Spectrometer



GCMS-QP2010 Plus Models with Optional CI, CI/NCI Gas Chromatograph – Mass Spectrometer

In addition to standard electrospray ionization (EI), these models add chemical ionization (CI) that is effective for molecular weight measurements and negative chemical ionization (NCI) that achieves high sensitivity selectively for forensic drugs and halogenated compounds such as chlorinated pesticides. These methods permit various analyses that fully exploit the features of the instrument. In addition to standard electrospray ionization (EI), these models add chemical ionization (CI) that is effective for molecular weight measurements and negative chemical ionization (NCI) that achieves high sensitivity selectively for forensic drugs and halogenated compounds such as chlorinated pesticides. These methods permit various analyses that fully exploit the features of the instrument.

GCMS-QP2010 Plus Gas Chromatograph-Mass Spectrometer Differential split flow turbo molecular pump system

The GCMS-QP2010 Plus is a powerful instrument for highly accurate identification of target analytes.

High-speed GCMS capability and Constant Linear Velocity mode, which supports optimum separation, are equipped as standard equipment. An innovative, new ion optics design avails more precise and reliable measurement of trace-level compounds.

The latest GCMSsolution software provides versatile functionality and ease of use, such as similarity search with linear retention indices.

The single turbo GCMS-QP2010S is also available as the best EI model.

Superior high-speed GCMS with world-class sensitivity

Front access for easy maintenance

Wide mass range : 1.5 - 1,090 m/z

High-speed Scan/SIM data acquisition technology,

FASST (Fast Automated Scan/SIM Type)

AART (Automatic Adjustment of Retention Times)

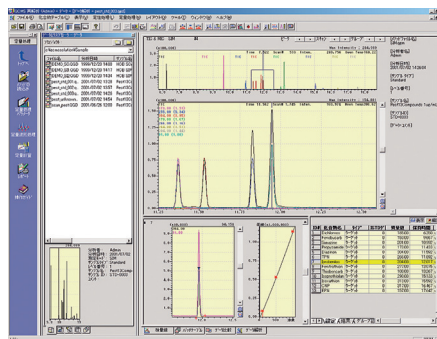
Pump down in under 4 minutes and input up to 15mL/min flow into the ion source.

Optional GC detectors (FID/ECD/FPD/FTD/TCD) can be mounted.



Direct Inlet Kit (option) Gas Chromatograph - Mass Spectrometer System

The direct inlet probe permits introduction of less volatile and/or thermally labile liquid or solid samples directly into the MS ion source without passing through the GC.



GCMSsolution Ver. 2 Series GCMS Workstation

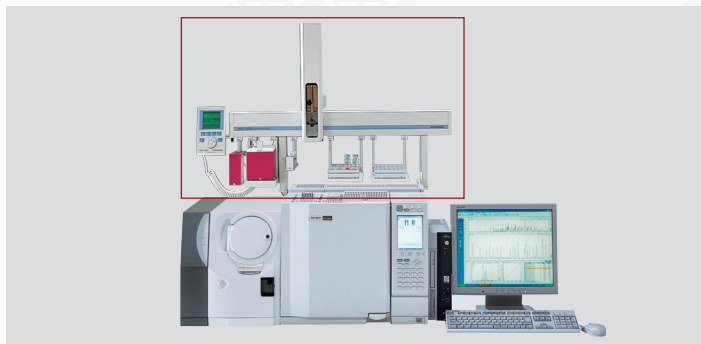
Features the operating environment common to all Shimadzu chromatograph workstations. Allows easy GCMS operation similar to GC or HPLC. The latest version offers AART (Automatic Adjustment of Retention Time) to significantly reduce the effort required to correct the retention times for multicomponent simultaneous analysis after column maintenance is complete. GCMSsolution that has become easier to use and features higher performance offers library searching by retention index and Scan/SIM simultaneous measurement functions to contribute to improved analysis efficiency.



GCMS-QP2010S
Gas Chromatograph Mass Spectrometer

A dedicated EI ionization instrument. Direct sample injection (DI) available as an option. Shares software with GCMS-QP2010 Plus for simple operation of the comprehensive functions. Compact but easily maintained GCMS.

- Mass range : m/z 1.5 to m/z 900
- Resolution : R > 2M
- Sensitivity : EI scan 1 pg
 Octafluoronaphthalene
 m/z 272 S/N ≥ 30 (RMS)



AOC-5000
Liquid Injection / Headspace Injector

The AOC-5000 is designed as an ideal front end automation for Gas Chromatography. It is the only GC sample injection system that combines liquid, large volume and headspace injection in one single instrument.

In headspace injection mode, the syringe injection with the robotic vial processing operation allows sample analysis in a straightforward and simple way.



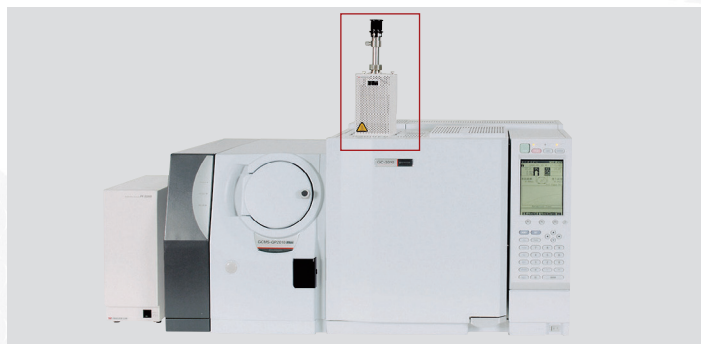
TD-20
GCMS Thermal Desorption Autosampler

Thermal desorption analysis is widely used for trace analysis of indoor air pollutants and gases generated from materials. Eliminates cold spots from the sample line and achieves low carryover.

The electronically cooled packed cold trap eliminates the need for refrigerant. Offers a sophisticated level of operation. Supports operation linked to GCMSsolution and electronic control of the carrier gas pressure and split ratio by AFC (Advanced Flow Controller).

- Number of samples : 48
- Valve temperature : 80 to 300 °C
- Sampling tube heating temperature : 80 to 400 °C

* Product does not include GCMS or PC set.



GCMS-QP2010 Plus + PY-2020iD*
GCMS Application System
Thermal Desorption Analysis System

This system conducts GCMS analysis of the products of thermal decomposition of polymer compounds such as plastics, rubber, and resins at decomposition temperatures of 500 °C and above. Allows PC control of evolved gas analysis, pyrolysis analysis, and double-shot pyrolysis analysis and various other modes.

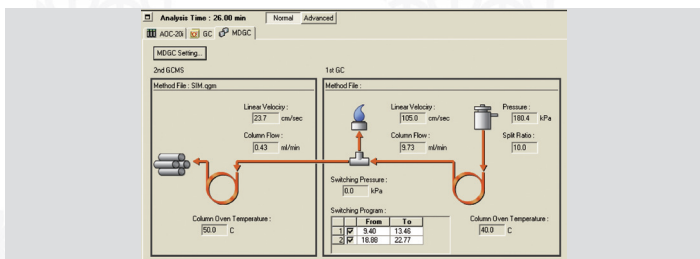
* Manufactured by Frontier Laboratories Ltd.

Gas Chromatograph



GC-2010AF (1st DET:FID)+GCMS-QP2010 Plus (2nd DET:MS) System

- Switching method : Multi-Deans switching
(Flow channel switching based on pressure difference)
- Switching element : Switching element subjected to deactivation processing
- Carrier gas control : Electronic control based on AFC
- Switching gas control : Electronic control based on APC
- Connectable columns : Capillary columns with an inner diameter of 0.1 to 0.53 mm (If the detector is a GCMS, the outlet flow rate must not exceed 15 mL/min.)
- Column oven temperature : (Room temperature + 4°C) to 350°C
- Temperature of connected heater : 50°C to 350°C
- Connectable detectors : GCMS, FID, FPD, TCD, ECD, FTD
(Other detectors must be special ordered.)



The majority of the work involved in MDGC analysis consists of determining the analytical conditions and switching timing that allow the target components to be separated. For this reason, the software's operability has a great influence on work efficiency.

The MDGC control software package, MDGCsolution, makes it possible to set the analytical conditions for both the 1st GC and 2nd GC or GCMS together. As a result, it is not necessary to switch between several different software products in order to make fine adjustments to the analytical conditions.



GC-2010AF (1st DET:FID)+GC-2010AF (2nd DET:FID) System

MDGC/GCMS-2010 Multi-Dimensional GC/GCMS system

The MDGC/GCMS-2010 with MDGCsolution software simplifies the normally difficult separation and quantification of compounds in complex, multi-component samples.

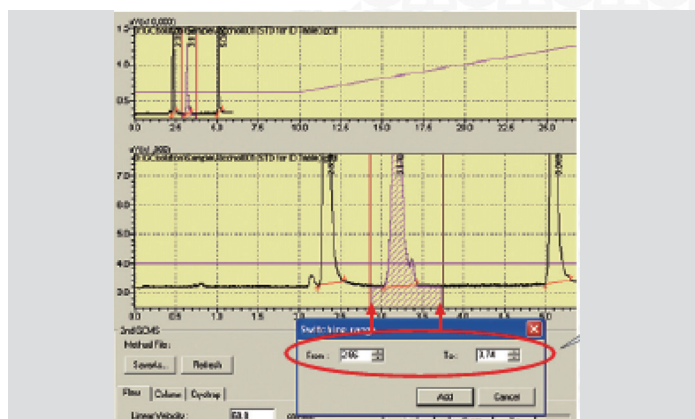
This system enhances separation performance for trace components in multi-component samples and is designed for a variety of applications, such as research and quality control in the fields of petroleum analysis, fragrance components, fine chemicals, and environmental substances.

Multi-Deans switching technology significantly reduces the likelihood of fluctuations in the retention times of eluted components and provides outstanding retention time stability, even if switching is performed several times.

Since the internal surface has been subjected to deactivation processing, a superior level of peak reproducibility is attained, and analysis with a high level of quantitative accuracy is possible.

The pressure and flow rate of the carrier gas and switching gas are precisely controlled with an Advanced Flow Controller (AFC) and an Advanced Pressure Controller (APC). This ensures superior reproducibility of analytical conditions.

When not using the MDGC/GCMS-2010 as an MDGC system, changing the column and detector connections makes it possible to use the conventional GC and GCMS components as independent systems.



MDGCsolution Workstation for MDGC/GCMS-2010

One important feature of MDGCsolution is that it allows the switching settings to be performed while viewing the chromatogram. Excellent peak picking capability provides superior intuitive operation.



GC-2010 Plus

- Column Temperature : (Room temperature + 4°C) to 450°C
- Carrier Gas Control : Digital setting by electronic flow controller, Advanced Flow Controller (AFC)
- Detector Gas Control : Digital setting by electronic pressure controller, Advanced Pressure Controller (APC)
- Sample Injector : Split/Splitless, Direct, On-column/Programmable Temperature Vaporizer Injection
- Detectors : FID, TCD, ECD, FPD, FTD (also called NPD or TSD)
- Display : 240 x 320 dot graphics display (30 characters x 16 lines)

GC-2010 Plus Series Capillary Gas Chromatograph

The GC-2010 Plus Series is ideal for enhancing analysis sensitivity and productivity. Excellent repeatability is assured by the optimized vaporization chamber and the electronic flow controller (AFC) that accurately controls the carrier gas up to the high-pressure, high-flowrate regions required for HPLC analysis.



GC-2014 Series Gas Chromatograph for versatile applications

The GC-2014 offers good expandability by mounting multiple injection units and detectors, and accommodating both packed columns and capillary columns. A multipurpose, space-saving GC that features today's leading-edge technologies, the GC-2014 delivers high performance, including excellent reproducibility and a highly sensitive detection level, while the electronic flow controller and clear menu text make operation a breeze.

- Column temperature: (Room temperature + 10°C) to 400°C
- Carrier gas control: Digital setting by electronic flow controller (AFC)
- Sample injector: Dual for packed, single for packed, split/splitless, direct injection
- Detectors: FID, TCD, ECD, FPD, FTD
- Display: 240 x 320 dot graphics display (30 characters x 16 lines)

GC-2010 Plus AF

Includes split/splitless sample injection unit and FID detector. Used to detect general organic compounds.

- Detector : Flame ionization detector (FID)
- Detector temperature : 450 °C max.
- Minimum detected quantity : 1.5 pgC/s (Dodecane)

GC-2010 Plus AT

GC-2010 incorporating microvalume TCD detector for capillary column operation. Permits high-resolution analysis of an extensive range of samples, including inorganic gases.

- Detector : Twin-filament thermal conductivity detector
- Detector temperature : 400 °C max.
- Sensitivity : 20,000 mV mL/mg min.

GC-2010 Plus ATF

GC-2010 Plus with FPD

Newly designed hollow-portal optics offer FPD sensitivity 4 to 5 times higher than conventional FPD. Powerful tool for sulfur (S) and phosphorus (P) trace analysis, such as residual pesticides. Simple maintenance and filter replacement.

- Detector : Flame photometric detector (FPD)
- Detector temperature : 350 °C max.
- Minimum detected quantity : P 0.2 pgP/s (tributyl phosphate)
S 4 pgS/s (dodecanethiol)

GC-2010 Plus with FTD/NPD

Alkali source with enhanced stability and response. Highly sensitive and selective detection of compounds containing nitrogen (N) and phosphorus (P). GC-2010-based model provides powerful support for the high-sensitivity analysis of pesticides.

- Method : Direct heating by induced current
- Detector temperature : 450 °C max.
- Minimum detected quantity : N 0.3 pgN/s (azobenzene)
P 0.03 pgP/s (malathion)

Model GC-2014AF

Model incorporating a sample injection unit for packed columns and FID detector. Digitally set flowrate is accurately controlled.

- Carrier gas control : Dual flow channel control by AFC (constant flowrate)
- Detector : Flame ionization detector (FID)
- Detector temperature : 400 °C max.
- Minimum detected quantity : 3 pgC/s

GC-2014AT

Model incorporating a sample built in unit for packed columns and TCD detector. Highly stable TCD detector and internal amplifier permit high-sensitivity gas analysis.

- Carrier gas control : Dual flow channel control by AFC (constant flowrate)
- Detector : 4-filament thermal conductivity detector
- Detector temperature : 400 °C max.
- Sensitivity : 40,000 mV mL/mg

GC-2014ATF/SPL

Model incorporating sample injection units for packed and capillary columns and FID and TCD detectors. Offers excellent split analysis repeatability. Optimal model for using both packed and capillary columns.

- Carrier gas control : Dual flow channel control by AFC for packed column; split/splitless single flow channel control for capillary column
- Temperature control : Independent temperature control of sample injection units and detectors

Gas Chromatographs



GC-8A Series Single Function GC

The GC best suited for routine analyses based on the design concept of providing the optimum condition using the best-suited columns and detectors, enhancing the efficiency of analysis.

- Detector : TCD, FID, ECD, FPD
- Digital temp : setting
- Pr Series : Automatic repeated temperature programmable
- P Series : Digital temperature programmable
- I Series : Isothermal



AOC-20i Auto Injector AOC-20s Auto Sampler

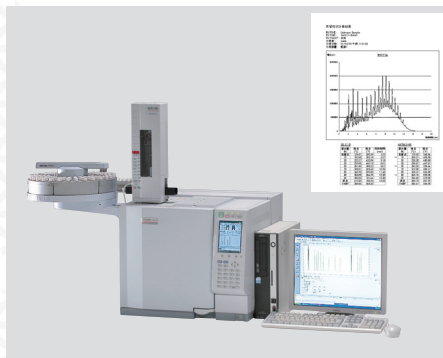
The AOC-20i Auto Injector can inject samples into a variety of injection ports, including split/splitless, direct (WBI), cool on column (OCI), or programmed temperature vaporization (PTV). In addition, ever-decreasing detection limits demand increased flexibility for different injection techniques, including large volume injection (LVI), solvent flush, and solvent flush with a second solvent. The AOC-20s provides sample transport to the AOC-20i Auto Injector using 1.5 ml and 4.0ml vials. The AOC-20i/AOC-20s is a powerful automation tool for GC laboratories that allows the users to take full advantage of the GC system's capabilities.



GC-2010 Plus (with PONAsolution) PONA Analysis System

Works with GCsolution to measure peak area %, weight %, volume % by carbon number or by type. Identification results can be observed while viewing the chromatogram on the monitor and easily manipulated by mouse operations.

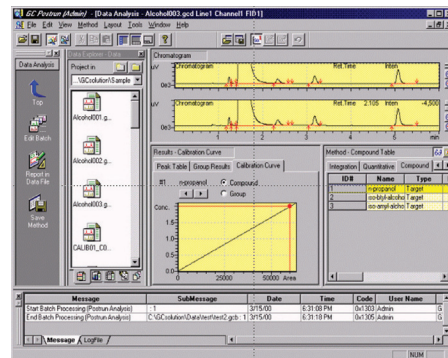
- Applicable samples : Naphtha, gasoline
- Items calculable from quantitation results : Mol%, mean molecular weight, density, carbon number, hydrogen content, oxygen content, octane number, vapor pressure, distillation characteristics



GC-2010 Plus (with GC Distillation Software) Gasoline Fraction Boiling Point Distribution Measuring System

Works with GCsolution to measure the boiling point distribution of gasoline fractions. Permits analysis by total area method and internal standard method. Plots and

- tabulates distillation curves.
- Retention time – boiling point conversion
- Piecewise linear approximation
- Specific temperature fractions 10 intervals
- Conversion to ASTM D-86 and D-1160
Compliant with JIS K 2254



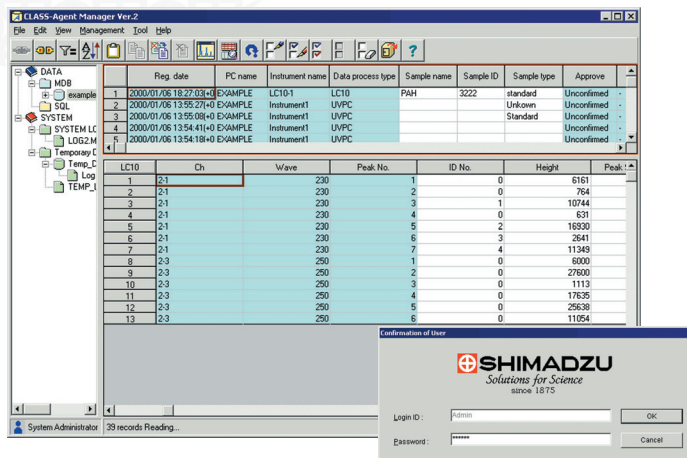
GCsolution Ver. 2 Workstation for Shimadzu Gas Chromatograph

GCsolution is the gas chromatograph version of LabSolutions, which is Shimadzu's new concept workstation for chromatography. GCsolution Ver. 2 is a GC control and data processing software working under Microsoft Windows that provides ease of use with the advantages of Shimadzu's proprietary Chromatopac integration algorithm. Max. 4 GC systems by the GC-2010/2014/17A/14 can be controlled.

GCsolution Ver. 2 supports GLP/GMP strongly with various user management functions and more.

Also, 21 CFR Part 11 compliance support functions are equipped as standard.

Data Processors and Software



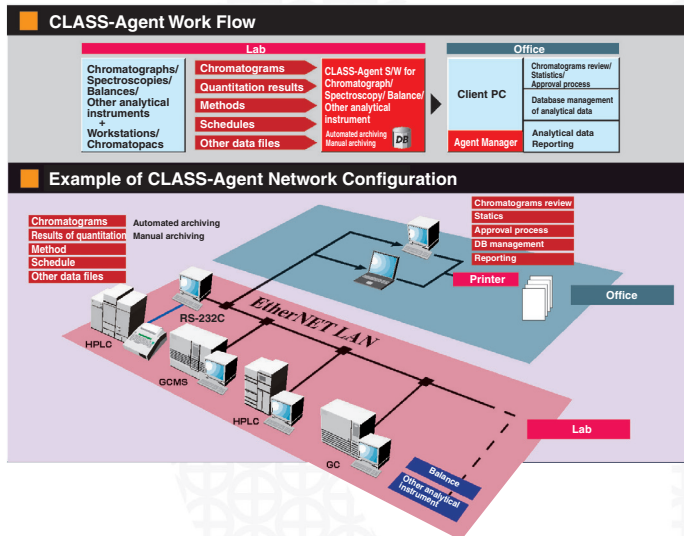
CLASS-Agent Ver. 2

Network-compatible data management tool, providing full support for FDA 21 CFR Part 11

The CLASS-Agent comprises an array of unique tools to manage various types of data from HPLC, GC, LC/MS, GC/MS, UV-VIS, FTIR and AA spectrophotometers, TOC analyzers, Thermal analyzers, electronic balances, and other analytical instruments.

The CLASS-Agent supports FDA 21 CFR Part 11 (Electronic Records and Electronic Signatures), and data security management and electronic signature functions are incorporated for data stored in the database. Data acquired by each analytical instrument are automatically transferred and stored in the database for quick and easy data retrieval.

All pertinent information associated with the data, such as the analytical method, original data acquisition date and time, operator's name, chromatograms, analytical report in pdf format, are stored



together. Both machine-readable data and human-readable data are also stored for Part 11 compliance. Through a computer network, all analytical instrument data can be managed from a central location such as a network server, enabling the data to be easily accessed from client PCs.

The latest CLASS-Agent Version 2.2 reinforced supports for electronic record functions, security for electronic signatures and automatic signature insertion to report file (pdf format), which are desired for FDA 21 CFR Part 11 compliance.

Optional "CLASS-Agent Report" software enables report generation using spreadsheets by Microsoft Excel in a Part 11 compliant environment.



LIMSsolution

Shimadzu's LIMSsolution Ver. 1.0 differs from most conventional information management tools that make up Laboratory Information Management Systems (LIMS), which generally only collate and manage common numerical information. The system has been developed with an eye on size and cost efficiency, and is available as a mini-LIMS that has undergone optimization to be ideally suited as an information management tool that can be used directly in conjunction with analytical instruments.



CHROMATOPAC C-R8A

This compact instrument incorporates all the functions required for chromatography.

- Signals from two sources can be processed simultaneously. (Optional two-channel board is required.)
- Simplified operation through the liquid crystal display.

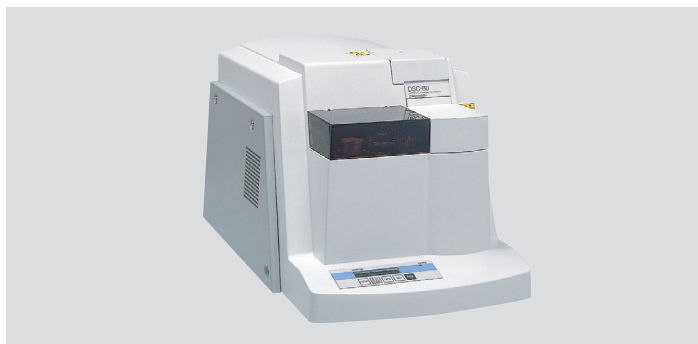
Thermal Analyzers



DSC-60 **Differential Scanning Calorimeter**

The development of a new-model detector makes it possible to achieve a peak height with twice the sensitivity (compared with other Shimadzu calorimeters) and at a noise level of less than 1mW. The DSC-60 also has a built-in liquid nitrogen cooling tank so that measurements involving a cooling process can be easily performed.

- Temperature range : -130°C to 600°C
- Measurement range : $\pm 40\text{mW}$
- Program speed : 0 to 99.9°C/min/°C/hour
- Cooling time : Approx. 6min. (Using liquid nitrogen to cool the sample from 600°C to 40°C)
- Measurement atmosphere : Air, Sample in a nonvolatile gas flow



DSC-60A **Automatic Differential Scanning Calorimeter**

This is an automatic DSC with a built-in autosampler. Generally, a whole day's load of samples (24 samples) can be set with different measuring conditions for each sample if required. And, operation is easy as a template system enables automatic analysis and automatic printout.

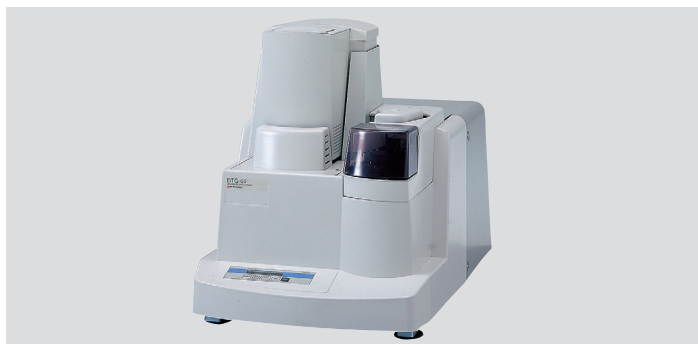
- Temperature range : -140 to 600°C
- Measuring range : $\pm 40\text{mW}$
- Noise level : $1\mu\text{W}$ (RMS value: the sample temperature is held at 150°C)
- Number of positions : 24 sample tray



DTG-60/60H **Simultaneous TG/DTA Instrument**

This device simultaneously performs differential thermal analysis and thermogravimetric analysis using a differential top-pan balance. The weighing range has been widely increased (a 2-fold or more increase in comparison with current Shimadzu products) while a stable baseline has also been achieved. Moreover, a Shimadzu-developed flow line construction enables testing with various atmospheric gases. (Note that certain reaction gases cannot be used.)

- Temperature range : Room temperature to 1100°C
- Maximum sample : 1g (including tare)
- Measuring range : TG $\pm 500\text{mg}$, DTA $\pm 1000\mu\text{V}$



DTG-60A/60AH **Auto Simultaneous TG/DTA Instrument**

The DTG-60A/60AH is a new automatic DTG which defines new standards in autosampler technology. The built-in automatic sampler can easily be operated and programmed, compared to the complicated operation and setup of conventional autosamplers. Up to 24 samples can be set up for analysis and additional sample trays can be used to quickly reload the autosampler, providing more than 24 hours of fully automatic analysis at one time.

- Temperature range : Room temperature to 1100°C
- Maximum sample : 1g (including tare)
- Measuring range : TG $\pm 500\text{mg}$, DTA $\pm 1000\mu\text{V}$



TMA-60/60H
Thermomechanical Analyzer

This analyzer can handle a wide variety of samples and measurement methods and a large temperature range to perform thorough measurement of the mechanical properties of materials. A high-precision digital sensor allows displacement measurement with a low drift in a wide range.

- Temperature range : Ambient to 1000°C/1500°C from -140°C with an optional adapter
- Measurement range : Displacement : ±5mm
 Load : ±5N
- Sample size : ø8x20mm, 5x1x20mm (60type)



TGA-50/50H/51/51H
Thermogravimetric Analyzers

Our TGA units have been designed to provide excellent performance for all aspects related to analysis, from vibration resistance and stability to noise level and fluctuations due to ambient temperature. These units can even clearly detect mass fluctuations as small as the several µg order (10µg for 51-model units). High-temperature H models are available for ceramic, catalyst, and other high-temperature applications.

The 51-model units are macro-type analyzers.

- Temperature range : Room Temp. to 1000°C/Room Temp. to 1500°C (H-models)
- Measurement range : ±20mg, ±200mg, (only ±2000mg(51-models)only)
- Maximum sample weight : 1g(tare weight)/
 10g(tare weight for 51 models)



DTA-50
Differential Thermal Analyzer

This is a DTA unit that utilizes a dumbbell type detector. The DTA-50 has a temperature controller, gas flow rate adjuster, transmission interface, and many other features built into a slim 17.3cm-wide body. The DTA-50 also offers high-temperature DSC performance.

- Temperature range : Room temp. to 1500°C
- Measurement range : ±0.2 to ±1000µV (from a minimum of ±0.2mW)
- Heating speed : 0 to ±50°C/min.



TA-60WS
Thermal Analyzer Workstation

The TA-60WS uses 32-bit application software that is fully compatible with Windows XP. Up to four thermal analyzers can be connected to the workstation, which is equipped with multi-channel, multi-task functions that make it possible to make measurements while simultaneously performing analysis.

- The workstation takes full advantage of the outstanding functions of Windows XP.
- Thermal analysis data can be transmitted quickly through Internet E-mail.
- The software is OLE compatible, making it easy to prepare reports using analysis data.
- The TA-60WS can also be connected to 50-Series thermal analyzers.

Biotechnology Instruments



Axima Performance™ Axima Performance - a highly flexible research-grade mass spectrometer

A high-performance MALDI-TOF mass spectrometer utilizing state-of-the-art high-energy MS/MS, delivering unparalleled flexibility, in a robust and reliable research-grade system.

- True high-energy MS/MS - CID with a laboratory frame collision energy of 20KeV
- Optimal precursor ion selection resolution using revolutionary gating technology
- Outstanding sensitivity - uncompromised design, to ensure no MS/MS signal is discarded
- Low sample consumption - allowing many more MS/MS experiments to be performed on the same sample spot
- LC-MALDI software allowing confident identification of off-line separated complex mixtures via automated MS/MS



Axima Confidence™ Powerful MALDI-TOF performance for reliable mass information and MS/MS-derived structural detail

The Axima Confidence™ is designed with the general analytical and life science laboratory in mind. Incorporating a variable repetition rate 50 Hz N₂ laser, the system provides rapid, high-quality MALDI mass spectra and an array of software tools for data processing and reporting.

- An affordable, robust option for all laboratories requiring routine manual or automated analysis of a wide variety of sample classes
- High-sensitivity system using a variable repetition rate 50 Hz N₂ laser and a variety of target formats to meet all sample throughput requirements
- Software packages specifically created for Proteomics, LC MALDI, Polymer analysis, tissue imaging/biomarker discovery, oligonucleotide/primer analysis



Axima Assurance™ High-performance Mass Detection

Linear MALDI-TOF mass spectrometer for reliable mass information

- An affordable, robust option for all laboratories requiring routine manual or automated analysis of a wide variety of sample classes
- High-sensitivity system using a variable repetition rate 50 Hz N₂ laser and a variety of target formats to meet all sample throughput requirements
- Ideally suited for high-throughput QA/QC application areas such as oligonucleotides/primers, synthetic peptides/proteins, polymer analysis, small molecules
- Intuitive software incorporating data-dependent workflows for achieving the maximum result with minimum user input, ideal for novice and expert users alike



AXIMA Resonance™ Matrix-Assisted Laser Desorption/Ionization Quadrupole Ion Trap Time-Of-Flight Mass Spectrometer

This MALDI-QIT-TOF mass spectrometer provides powerful support for proteomics and sugar chain analysis.

It incorporates a quadrupole ion trap (QIT) for fmol-order MS_n measurements of the ions generated by MALDI.

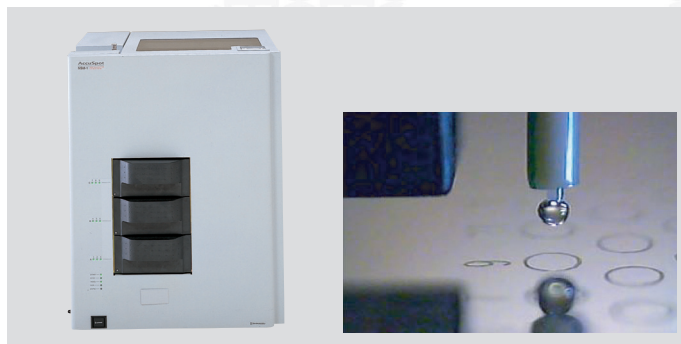
These features provide structural information in addition to molecular weights, making MALDI-QIT-TOF MS widely used for proteomics, biochemistry, pharmaceuticals, medicine, synthetic chemistry, and structural analysis of organic compounds.

Biotechnology Instruments



CHIP-1000 **Chemical Inkjet Printer**

The CHIP (Chemical Inkjet Printer) is a revolutionary new approach to Peptide Mass Fingerprinting and Protein Macroarray Analysis. The strategy complements established protocols in resolving proteins by 2-D gels. However, unlike classical approaches, the CHIP reproducibly dispenses picoliter volumes of reagents to defined locations on a PVDF membrane, opening new horizons for micro-scale protein research and repeated sub-analysis.



AccuSpot

The AccuSpot automates LC microfractionation, spotting and preparation for MS analysis.

With the AccuSpot system, LC eluent can be accurately and continuously spotted onto target plates.

This allows for automatic preparation of target plates for MALDI-TOF-MS measurements.

By using it in conjunction with Shimadzu's Two-Dimensional Micro LC System and Shimadzu AXIMA MALDI-TOF instruments, proteome analysis can be performed with a higher degree of precision and with greater sequence coverage.



PPSQ-31A/33A **Automated Protein/Peptide Sequencing System**

A fully PC-controlled protein sequencer, PPSQ-31A/33A systems are equipped with a specially designed, novel and precise reagent delivery system for the reproductive gas-phase Edman degradation cycles.

The PPSQ-31A/33A consists of an Edman reaction unit, an on-line PTH-amino acid analyzer with an LC pump and UV detector, and Windows 95™ base software. The PPSQ-31A is a single-reactor system for high-value performance, while the PPSQ-33A is a triple-reactor system for 3-sample continuous operation. Both systems allow easy operation, easy interpretation, as well as high-value performance with high precision.



PSSM-8 **Automated Solid-Phase Peptide Synthesizer in Simultaneous Multiple Mode**

This is a highly efficient peptide synthesizer that offers excellent safety and ease-of-operation with few side reactions. It economically synthesizes from one to eight high-purity peptides simultaneously in target quantities from 5 μmol .

Biotechnology Instruments



¹³C NBS Stable Isotope Labeling Kit-N for Proteome Expression Profiling

Compares and analyzes the quantitative difference in expression between two proteomic states (between normal and diseased models, for example) by selectively labeling tryptophan residue.

- Selectively labels tryptophan (W) in protein.
- Identifies labeled target fragments by 6 Da difference in mass between doublet peaks.
- Labeled target fragments can be easily separated using a column with a higher concentrating effect.



ORFinder®-NB Mass Sequencing Kit Protein N Terminal Sequencing Kit

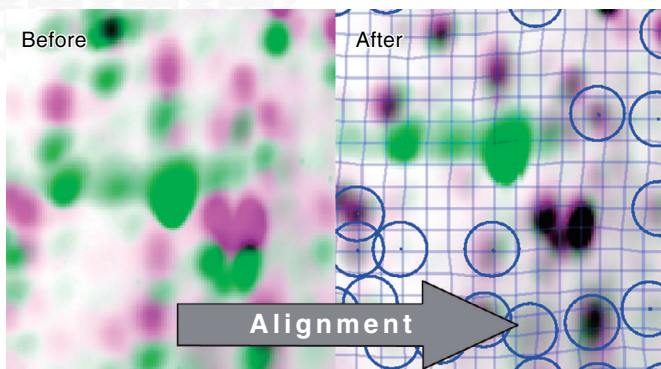
Permits isolation of N-terminal fragments, even from proteins with a blocked N terminal. N-terminal fragments from proteins with an unblocked N terminal are recovered as a sulfonic acid derivative, which permits de novo sequencing by MALDI-MS/MS. Isolation of N-terminal fragments is possible even when multiple proteins are combined in a single SDS-PAGE sample (band).



Transdirect *insect cell* Protein N Terminal Synthesis Kit

This is a new cell-free protein synthesis kit derived from insect cell cultures. It achieves superior protein synthesis capacity to a rabbit reticulocyte system. The kit comes with optimized reaction buffers and expression vectors to allow optimal protein synthesis tests to be easily conducted.

- Uses extracts derived from Sf21 insect cell culture.
- Includes high-efficiency expression vectors.



Progenesis SameSpots

Alignment corrects gel distortion according to the shade of the spot and superimposes the spots.

It permits differential analysis as if electrophoresis of multiple samples had been conducted on a single gel.

Supports dyeing methods including CBB dyeing, fluorescent dyeing, and 2D DIGE.

- Before: E.coli mutant spots (green)
E.coli wild type spots (pink)
- After: Superimposed spots displayed black

Progenesis Electrophoresis Gel Image Analysis Software

Two-dimensional electrophoresis gel image analysis software using the latest algorithms. Offers high-accuracy spot detection and gel alignment. Offers an easy-to-use environment with diverse analysis tools and automated analysis functions.

Progenesis SameSpots

Permits 100% accurate spot matching with simple operations. Able to match all gels to obtain quantitation results without missing values or matching errors.

- Software alignment of gel distortion in pixel units.
- Detects all gel spots with the same shape. Editing of any spot is reflected in all spots.

(Note) A separate PC is required that meets the required specifications.



BioSpec-nano Life Science Spectrophotometer

This is a dedicated spectrophotometer for checking the concentration and purity of nucleic acid samples. It analyzes 1 to 2 μ L trace samples of nucleic acids. Simply drop the sample onto the window with a pipette and press the [Start] button on the instrument or click the [Start] button on the software screen to start automatic light path setting, measurement, and wiping of samples on the window.

It is not necessary to make vertical arm adjustments or wipe the window with a cloth. Dedicated software simplifies operation. Just click buttons on the toolbar to conduct basic operations including measurement, report printing, and exporting data.

- Light path : 0.2 mm, 0.7 mm (manual switching)
- Sample quantity : 0.2 mm light path: 1 μ L min.; 0.7 mm light path: 2 μ L min.
- Quantitation range (OD, converted to double-stranded DNA concentration) :
0.2 mm light path: 1 to 75 OD, 50 to 3,700 ng/ μ L
0.7 mm light path: 0.3 to 21 OD, 15 to 1,000 ng/ μ L
- Wavelength range : 220 to 800 nm
- Wavelength accuracy : \pm 1 nm

Progenesis PG220/PG200

Software for comparison analysis of two-dimensional electrophoresis gels.

- Warping function automatically corrects gel distortion and superimposes the spots.
- Using the latest algorithms to evaluate the spot region, quantitative comparison of proteins, and highly accurate differential spot evaluation.

TotalLab TL120

One-dimensional electrophoresis gel image analysis software.



MultiNA A fully automated Microchip Electrophoresis System for DNA/RNA Analysis

A new electrophoresis analysis platform with Shimadzu's renowned microchip technology provides an alternative to agarose gel electrophoresis.

- Lower analysis costs with a sophisticated reusable microchip
- Greater speed with automatic operation of up to 120 analyses and 75 seconds/analysis cycle time
- High-sensitivity detection with a LED-excited fluorescence detector, 10 times more sensitive than ethidium bromide staining
- High resolution and high reproducibility ensured by lower and upper marker in the reagent kit
- Outstanding ease of use with the control and viewer software

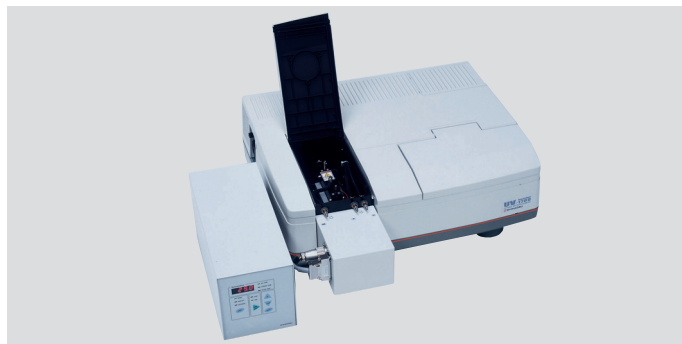
Biotechnology Instruments



BioSpec-mini Nucleic Acid & Protein Spectrophotometer

The BioSpec-mini is a dedicated life-science spectrophotometer designed to meet the growing requirement for compact spectrophotometers used for the quantitation of micro amounts of DNA, RNA, and protein.

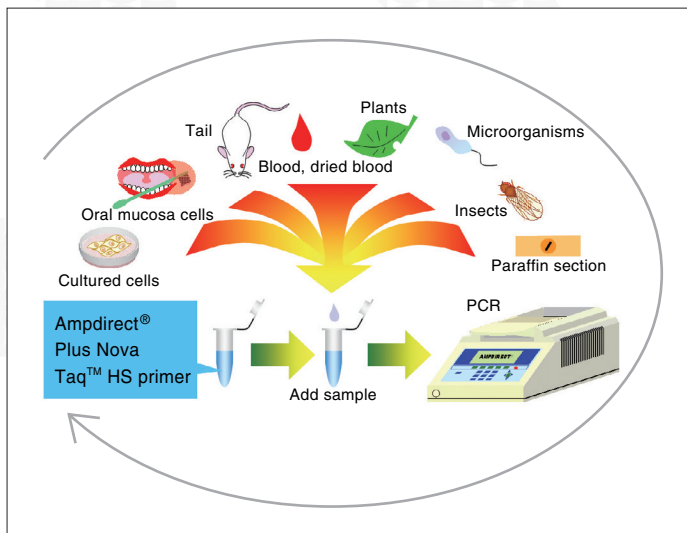
- Easy operation and speedy quantitation with a large LCD
 - Micro-amounts measurable with a 5 μ L cell
 - Installed with utility program
- Calculation of nucleic acid molecular weight and molar absorbance coefficient (ϵ), and Tm estimation by the nearest base pair model are possible.



TMSPC-8 Tm Analyzer

(Requires spectrophotometer or other such system separately)
By combining this analyzer with a UV-Vis spectrophotometer, this system achieves high-throughput parallel Tm analysis of nucleic acids. Analyses from 100 μ L are possible with the special 8-cell microcell. It includes all-in-one PC software.

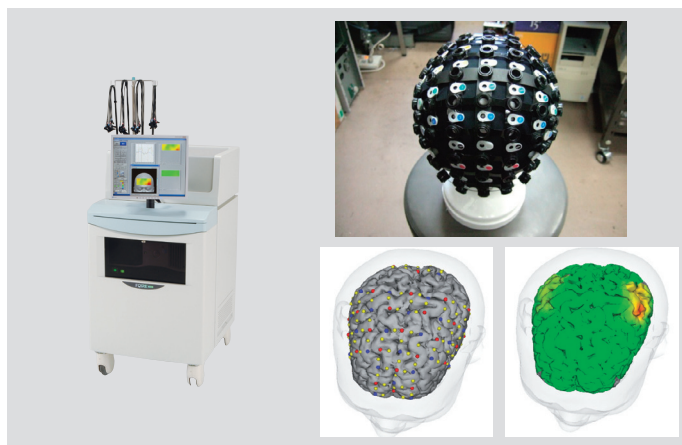
- Temp. Control Range: 0.0 $^{\circ}$ C to 110.0 $^{\circ}$ C
- Temp. Change Rate: \pm 0.1 $^{\circ}$ C to 5.0 $^{\circ}$ C per minute (12 steps)
- Temp. Control System: Heating/cooling by Peltier element
- Compatible Models: BioSpec-1601, UV-1601, UV-1650PC, UV-1700, UV-1800, UV-2401PC/2501PC, UV-2450/2550, and UV-3600



Ampdirect[®] Plus DNA Amplification Reagent

Ampdirect (PCR buffer) restricts the effects of PCR inhibitors such as proteins and sugars. Therefore, simply using Ampdirect as the buffer eliminates the need for DNA purification before PCR.

- Quick and easy PCR
- No DNA purification – ideal for PCR of trace samples without sample loss
- Restricts PCR inhibition by impurities in the sample to allow stable PCR.
- No DNA extraction kit or equipment required – restricts running costs



FOIRE-3000 Series Optical Brain-Function Imaging System for Research

Uses safe near infrared radiation to measure the oxygen status on the brain surface. It offers realtime observations of the positions and status of brain activity during higher order brain functions such as seeing, hearing, and motion.

- Measurement items :
 - Variation from initial values of Oxygenated hemoglobin (Oxy-Hb)
 - De-oxygenated hemoglobin (Deoxy-Hb)
 - Total hemoglobin (Total-Hb)
- Number of measured channels :
 - FOIRE-3000/4: 10 FOIRE-3000/8: 24
 - FOIRE-3000/12: 38 FOIRE-3000/16: 52

Note) This instrument and its options are intended for research purposes only and cannot be used for medical diagnostics and cares. The OMM-3000 Series Near Infrared Imaging System is available for medical applications. (Japanese Approval No.: 21300BZZ00517000)

Total Organic Carbon Analyzers



TOC-Vcs/CP Series

The 680°C combustion catalytic oxidation method, which was developed by Shimadzu and subsequently has become the world *de facto* standard, can efficiently analyze all organic compounds.

- Extremely wide range from 4µg/L to 25,000mg/L for applications from ultra-pure water to highly contaminated water.
- Choice of Standalone or PC-controlled models/ High-sensitivity or Standard models. (Standalone models can be upgraded to PC-controlled models.)
- PC-controlled models support FDA 21 CFR Part 11 compatibility.

Model	TOC-VCSH	TOC-VCSN	TOC-VCPH	TOC-VCPN
Measurement method	680°C combustion catalytic oxidation/NDIR method			
Measured items	TC, IC, TOC, NPOC (Option: POC, TN)			
Measurement Range (mg/L)	TC	0 - 25,000	0 - 25,000	0 - 25,000
	IC	0 - 30,000	0 - 3,000	0 - 3,000
Detection limit	4µg/L	50µg/L	4µg/L	50µg/L
Sample Injection	Automatic injection			

TOC-Vws/WP Series

Wet oxidation TOC Analyzers aim for high sensitivity with great oxidation performance by combining UV light, heat, and persulfate methods.

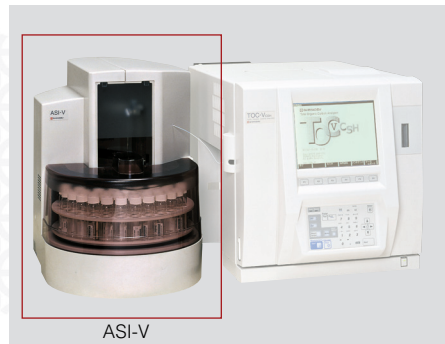
- Ultra-high sensitivity: 0.5µg/L detection limit
- Choice of Standalone or PC-controlled model. (Standalone model can be upgraded to PC-controlled model.)
- PC-controlled model supports FDA 21 CFR Part 11 compatibility
- Measured items: TC, IC, TOC, NPOC
- Measurement range: TC 0 – 3,500mg/L, IC 0 – 3,500mg/L



TOC-VE

A basic combustion catalytic oxidation model incorporating all essential functions.

- Easy measurement through manual sample injection and simple operations.
- Simultaneous TOC and TN measurement is possible with an optional TN unit.
- 680°C combustion catalytic oxidation /NDIR method.
- Measured items: TC, IC, TOC, NPOC, (Option: TN)
- Measurement range: TC 0 – 20,000mg/L, IC 0 – 20,000mg/L



ASI-V

Auto-sampler for TOC-V Series

Combining the ASI-V automatic sampler with a TOC-V series (except TOC-VE) creates a fully automatic analysis system.

- Vial types: 24mL (x 93 vials), 40mL(x 68 vials), 125mL(x 24 vials), and optional 9mL vial rack.
- Sample sparging function with an optional external sparge kit.



OCT-1

8-Port Sampler for TOC-V Series

An innovative but inexpensive auto-sampler which can accept any sample container.

- Connection up to 2 OCT-1 units.
- Number of vials: 8 or 16 (with 2 OCT-1 units)

Total Organic Carbon Analyzers



TNM-1

TNM-1 TN (Total Nitrogen) Unit

Combining the TNM-1 with a TOC-Vcs/CP/VE analyzer creates a TOC/TN simultaneous analysis system.

- Measurement method: Chemiluminescence
- Measured item: TN (total nitrogen)
- Measurement range: 0 – 4,000mg/L
(0 – 200mg/L for TOC-VE)
- Measuring time: approx. 4 minutes



SSM-5000A

SSM-5000A Solid Sample Combustion Unit

Combining the SSM-5000A with a TOC-Vcs/CP or a TOC-Vws/WP analyzer permits analysis of many solid samples in addition to aqueous samples, including soil, sludge, and sediments.

- Method: TC - Catalytically aided combustion oxidation at 900°C.
IC - Pre-acidification, oven temperature 200°C.
- Max. Sample amount: 1g



ON-LINE TOC-Vcsh

High-sensitivity continuous monitoring of water samples such as pure water and tap water.

- 680°C combustion catalytic oxidation /NDIR method.
- Measured items: NPOC, TC, IC, TOC (TC-IC), (Option: TN)
- Measurement range: TC 0 – 25,000mg/L,
IC 0 – 30,000mg/L
- Measurement cycle: Approx. 5 – 999 minutes
(for NPOC measurement)
- Equipped with off-line measurement functions.

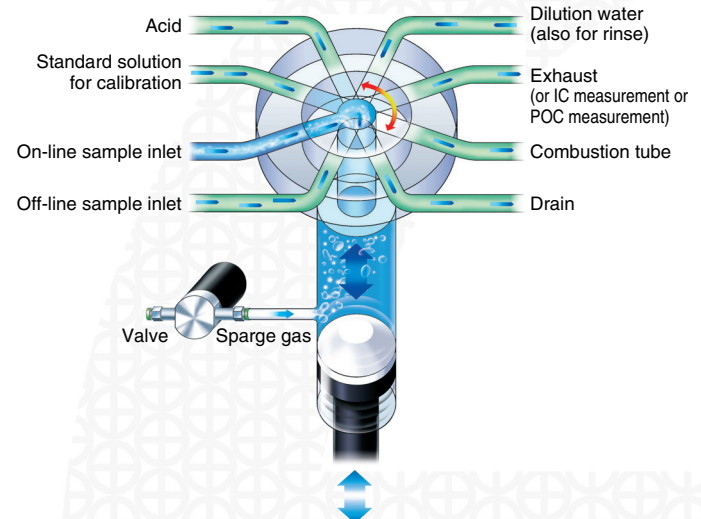


4110 Series On-line Total Organic Carbon & Total Nitrogen Analyzer

The 4110 series offer quick and accurate analysis of total organic carbon and total nitrogen in water. A variety of applications includes management of waste water treatment plant influent and effluent, drinking water supply management, and monitoring of impurities in process and surface water (rivers, lakes, and streams).

- Auto-dilution function enables TOC measurement up to 20,000mg/L (TOC-4110 and TOCN-4110).
- Simultaneous measurement of TOC and TN with a single instrument (TOCN-4110).
- Quick TN measurement up to 4,000mg/L full scale (TOCN-4110 and TN-4110).
- Equipped with a variety of sample treatment functions and injection systems.

Model	TOC-4110	TOCN-4110	TN-4110
Measurement method	680°C combustion catalytic oxidation/NDIR	TOC by 680°C combustion catalytic oxidation/NDIR TN by combustion decomposition / chemiluminescence	Combustion decomposition / chemiluminescence
Measured items	NPOC, TC, TOC (TC-IC), TOC (NPOC+POC)	NPOC, TC, TN, TOC (TC-IC) TOC (NPOC+POC)	TN
Measurement Range	From 0 - 5mg/L to 0 - 20,000mg/L	TOC: from 0 - 5mg/L to 0 - 20,000mg/L TN: from 0 - 1mg/L to 0 - 4,000mg/L	From 0 - 1mg/L to 0 - 4,000mg/L



Gas Analyzers



7000 Series Transportable Gas Analyzers

Analyzers of NO_x, SO₂, CO, CO₂, CH₄, O₂ concentration in various combustion exhaust gases of boilers and industrial furnaces. The 7000 series is also used for research purposes.

- Innovative system design capable of real-time data display or trends in concentration on a large backlit LCD screen.
- Built-in functions such as air-leak correction and averaging.
- Continuous data storage by IC memory card for more than 10 days at 30-second intervals.

Model	NOA-7000	CGT-7000	SOA-7000
Description	NO _x -O ₂ Chemiluminescence Gas Monitor	CO/CO ₂ /CH ₄ Infrared Gas Monitor	SO ₂ Infrared Gas Monitor
Range	NO _x : 0-25/50/100/250/500/1000/2500/4000ppm O ₂ : 0-5/10/25 vol%	CO: from 0-100ppm to 0-100vol% CO ₂ : from 0-1000ppm to 0-100vol% CH ₄ : from 0-200ppm to 0-100vol% O ₂ : 0-5/10/25vol% (option)	SO ₂ : 0-100ppm to 0-1vol% O ₂ : 0-5/10/25vol% (option)
Repeatability	within +/-0.5% of full scale	within +/-0.5% of full scale	within +/-0.5% of full scale



CFP-8000 Sample Pretreatment Unit for 7000 Series

This unit is for use when the sample gas contains a high level of moisture, dust, mist, and other corrosive components. It is also effective when used with continuous sampling monitors to reduce maintenance frequency.

Gas Analyzers



NSA-3080 Flue Gas Multi-Component Gas Concentration Analyzer

The NSA-3080 employs a micro-computerized, multi-component, Ratio-NDIR gas analyzer for the measurement of NO_x, SO₂, and CO or CO₂. An O₂ detector is also incorporated to allow measurement of a total of the five components simultaneously.

- Application:
Measurement of NO_x, SO₂, CO, CO₂, and O₂ concentrations in exhaust gases from various boilers, industrial plants (petroleum refinery, steel, cement, etc.), incinerators, and thermal treatment furnaces.

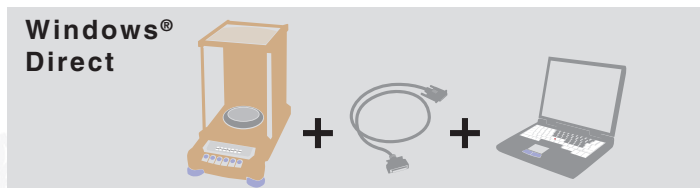
Balances



Shimadzu's Unique Features

UniBloc Balances

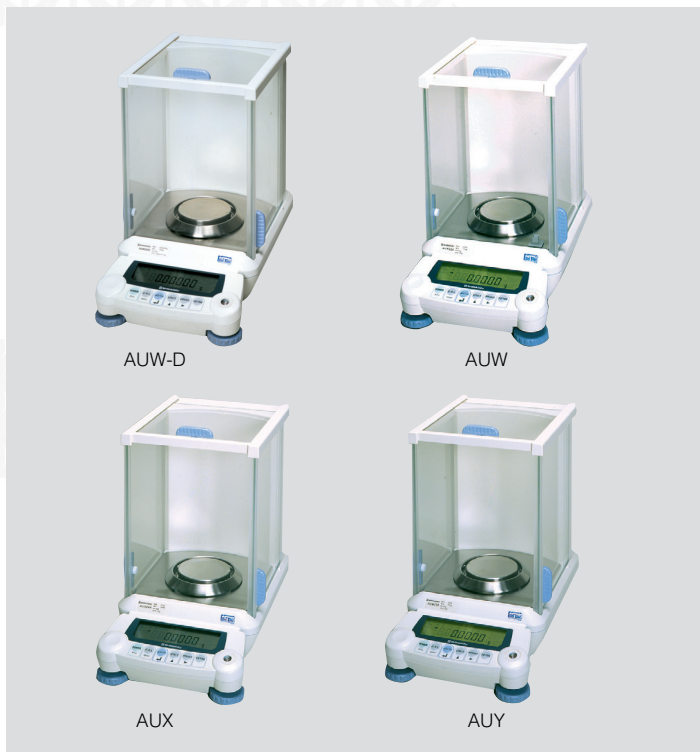
Shimadzu introduced one-piece force cell technology commercially for precision balances in 1989. Today's UniBloc is created by high-precision wire electrical discharge machining applied to a block of aluminum alloy, and replaces the conventional electromagnetic balance sensor assembly. UniBloc's compact, uniform structure ensures stable temperature characteristics, excellent response time and stable corner-load performance. The UniBloc design permits a consistency of production that assures reliability and a long operational life. The updated UniBloc technology expands the UniBloc family balance lineup, which now ranges from semi-micro with a minimum display of 0.01mg to precision platform balances up to 52kg in capacity.



Unpack and get ready!

Windows® Direct

Shimadzu's unique Windows® Direct function provides the handiest data transmission to a computer. An RS-232C cable is all you need to add. No software installation is required. With the print key, the weighed result is sent to the cursor position of any application on Windows®. Auto print functions can also be combined with Windows® Direct for automatic data collection.



Shimadzu's UniBloc Balances

AU/AUW/AUX/AUY Series

AUW-D dual-range analytical balances are the world's first semi-micro balances with the advantages of UniBloc technology. Together with the single-range AUW/AUX/AUY series, they offer unrivalled response, zero-return and stability. Accurate measurement is maintained with two modes of fully-automatic calibration: PSC (temperature based) and Clock-CAL (by time setting). The built-in clock supports automatic calibration reports that meet GLP/GMP/ISO requirements. Shimadzu's unique WindowsDirect function allows handy yet secure data transmission to any user's Windows applications without additional software. Density and specific gravity can be computed with the standard software. A dedicated specific gravity measurement kit (option) enhances efficiency even further.

AUW-D/AUW/AUX/AUY Series

Model	Capacity	Minimum display	PSC	Clock-CAL	GLP/GMP/ISO calibration report	Windows Direct
AUW220D	220g/82g	0.1mg/0.01mg	●	●	●	●
AUW120D	120g/42g	0.1mg/0.01mg	●	●	●	●
AUW320	320g	0.1mg	●	●	●	●
AUW220	220g	0.1mg	●	●	●	●
AUW120	120g	0.1mg	●	●	●	●
AUX320	320g	0.1mg	●		●	●
AUX220	220g	0.1mg	●		●	●
AUX120	120g	0.1mg	●		●	●
AUY220	220g	0.1mg				●
AUY120	120g	0.1mg				●



STABLO®-EX Static Remover, 2-Way Ionizer

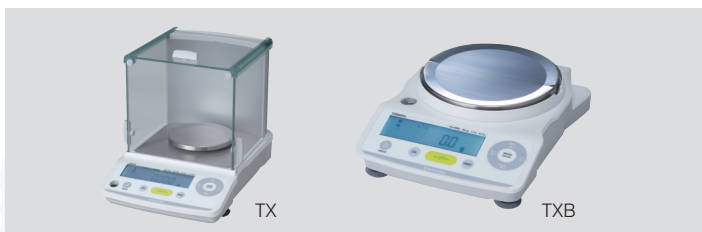
- Static removal method : AC corona discharge
- Static removal range : Approx. 5 to 50 cm from discharge electrode (Fan ON)
- Ozone concentration : 0.04 ppm (measured 2 cm from discharge electrode, Fan ON)
- Discharge electrode material : SUS304, service life 10,000 hours
- Weight : Approx. 540 g (ionizer unit approx. 110 g, stand approx. 430 g)



UW/UX Series

Shimadzu's newest top-loading balance series provides the supreme combination of performance and innovative features. The weighed result is displayed instantly and stands still. Excellent durability also meets repeated use in production sites. Choice of auto print modes and Shimadzu's unique WindowsDirect function enhance productivity without optional software. Check-weighing modes for quality control purposes and a back light display are also useful features in factory use. Measurement administration is also given good consideration. A calibration report can be automatically output to meet international standards. The UW is equipped with built-in calibration weight and PSC, and Clock-CAL fully automatic calibration functions as standard.

Specific gravity measurement software is already installed and an optional measurement kit allows more efficient measurements.



TX/TXB Series

The beginning of the new standard: TX/TXB has everything you need. We changed key layout for easy operation, making operation as easy as using a cell phone. One-touch operation enables easy adjustments for optimum stability. It is equipped with WindowsDirect, which enables direct transport of data to a PC, requiring only a PC cable. And this product has various functions, including an Expanded Piece Counting function, Illuminated display, anti-theft options, and more.



ELB Series

Handy low-cost balances, but with no compromise in accuracy. A reliable strain-gauge load cell brings resolution up to 30,000. One-second response comes with accuracy and stability. Piece counting, percentage, unit conversions and specific gravity software are all standard features. Now all these advantages are available with dry battery operation. Easy battery replacement and long battery life make this series the most user-friendly for field use.

UW Series

Model	Capacity	Minimum display	PSC	Clock-CAL	GLP/GMP/ISO calibration report	Windows Direct
UW220H	220g	0.001g	●	●	●	●
UW420H	420g	0.001g	●	●	●	●
UW620H	620g	0.001g	●	●	●	●
UW2200H	2200g	0.01g	●	●	●	●
UW4200H	4200g	0.01g	●	●	●	●
UW6200H	6200g	0.01g	●	●	●	●
UW420S	420g	0.01g	●	●	●	●
UW820S	820g	0.01g	●	●	●	●
UW4200S	4200g	0.1g	●	●	●	●
UW8200S	8200g	0.1g	●	●	●	●

UX Series

Model	Capacity	Minimum display	PSC	Clock-CAL	GLP/GMP/ISO calibration report	Windows Direct
UX220H	220g	0.001g			●	●
UX420H	420g	0.001g			●	●
UX620H	620g	0.001g			●	●
UX2200H	2200g	0.01g			●	●
UX4200H	4200g	0.01g			●	●
UX6200H	6200g	0.01g			●	●
UX420S	420g	0.01g			●	●
UX820S	820g	0.01g			●	●
UX4200S	4200g	0.1g			●	●
UX8200S	8200g	0.1g			●	●

TX Series

Model	Capacity	Minimum display	Windows Direct
TX223L	220g	0.001g	●
TX323L	320g	0.001g	●
TX2202L	2200g	0.01g	●
TX3202L	3200g	0.01g	●

TXB Series

Model	Capacity	Minimum display	Windows Direct
TXB222L	220g	0.01g	●
TXB422L	420g	0.01g	●
TXB622L	620g	0.01g	●
TXB2201L	2200g	0.1g	●
TXB4201L	4200g	0.1g	●
TXB6201L	6200g	0.1g	●
TXB621L	620g	0.1g	●
TXB6200L	6200g	1g	●

ELB Series

Model	Capacity	Minimum display	Rechargeable battery (option)	Dry battery operation (standard)
ELB120	120g	0.01g	N/A	●
ELB200	200g	0.01g	N/A	●
ELB300	300g	0.01g	N/A	●
ELB600	600g	0.05g	N/A	●
ELB600S	600g	0.1g	N/A	●
ELB1200	1200g	0.1g	N/A	●
ELB2000	2000g	0.1g	N/A	●
ELB3000	3000g	0.1g	N/A	●
ELB6000S	6000g	1g	N/A	●
ELB12K	12000g	1g	N/A	●

Balances



BW-K/BX-K Series

Large-capacity balances with fine readability offer various possibilities for industries: weighing precious materials in bulk, efficient but precise compounding, confirming small parts not missing in a large assembly, etc. UniBloc technology gives fast response, display stability and endurance, all of which are essential for large-capacity industrial balances. Auto print, WindowsDirect and various productivity functions are ready for use as standard features. The BW-K has a large-size built-in calibration weight to ensure utmost accuracy.

BW-K/BX-K Series

Model	Capacity	Minimum display	Built-in calibration weight	GLP/GMP/ISO calibration report	Windows Direct
BW12KH	12kg	0.1g	●	●	●
BW22KH	22kg	0.1g	●	●	●
BW32KH	32kg	0.1g	●	●	●
BW32KS	32kg	1g	●	●	●
BW52KS	52kg	1g	●	●	●
BX12KH	12kg	0.1g		●	●
BX22KH	22kg	0.1g		●	●
BX32KH	32kg	0.1g		●	●
BX32KS	32kg	1g		●	●
BX52KS	52kg	1g		●	●



BL Series

Compact and affordable, they achieve high accuracy using the same electro-magnetic system as in analytical balances'. Their quick response is appreciated particularly in production and quality control sites. Unit conversion, percentage conversion and piece counting are standard features. The BL3200HL model is equipped with a back light display.

BL Series

Model	Capacity	Minimum display	Description
BL220H	220g	0.001g	
BL320H	320g	0.001g	
BL2200H	2200g	0.01g	
BL3200H	3200g	0.01g	
BL3200HL	3200g	0.01g	Display backlight
BL320S	320g	0.01g	
BL620S	620g	0.01g	
BL3200S	3200g	0.1g	



EP-80

EP-90

Electronic Printer EP-80 and EP-90

Designed to be used with Shimadzu Electronic Balances, The EP-80/EP-90 are easy to connect and operate. Printing method is impact dot, which is suitable for data storage meeting ISO/GLP/GMP requirements. The statistic calculation function allows up to 1000 samples to be analyzed. The AC adapter and battery operations can be switched. With the EP-90, ID number, sample number, date and time can be automatically attached when printing the measurement results.



Electronic Moisture Balance MOC-120H

Reliable moisture measurement backed by UniBloc technology

Thanks to the large sample pan backed by the unique continuous auto-taring mechanism, the MOC-120H delivers perfect accuracy, even to customers with high sample volumes and large quantities. Regardless of your application, the wide selection of measuring modes offers the best solution to achieve fast and accurate results. Best suitable for research laboratories, delivery inspection and in-process control.

Fine Particles and Powder Analyzers



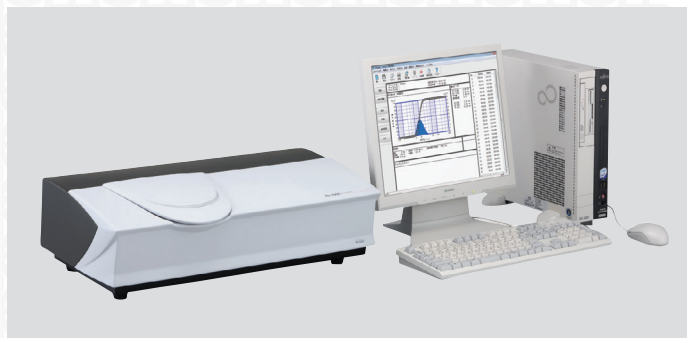
SALD-3101/2201 **Laser Diffraction** **Particle Size Analyzer**

The sampler is equipped with a powerful pump that ensures the reliable circulation of coarse and high-density particles, making the SALD-3101 suitable for the particle distribution analysis of soil and sand. It is ideal for research into environmental problems and measures for disaster prevention.

- Measurement range : 0.05 to 3,000 μm
- Light source : Red semiconductor laser (wavelength: 690 nm)

The SALD-2201 is extensively used for particle size measurement in various fields, such as mining, construction, civil engineering, paper production, textiles, chemicals and pharmaceuticals, foods, ceramics, metallurgy, machinery, electrical and electronics, and even biology.

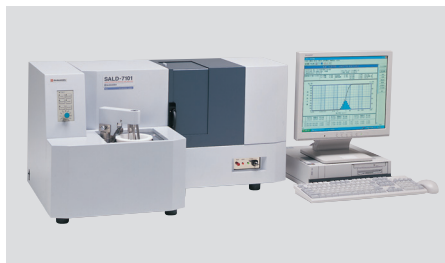
- Measurement range : 0.03 to 1000 μm
- Light source : Red semiconductor laser (wavelength: 680 nm)



IG-1000 **Single Nano Particle Size Analyzer**

Uses Shimadzu's revolutionary Induced Grating (IG) particle size measurement technology. This method exploits dielectrophoresis instead of scattered light. Numerous particles form a diffraction grating and the particle sizes are measured from the rate of diffusion and decay of the diffraction grating. Adequate signals are obtained even in the single nano region to achieve highly sensitive measurements with excellent repeatability.

- Measurement range : 0.5 to 200 nm
- Measuring time : 30 sec
- Batch cell method, sample flow rate : 250 μL to 300 μL



SALD-7101 **Nano Particle Size Analyzer**

The SALD-7101 measures the distribution change of particles ranging from 10 nm to 300nm in one-second steps. Using optional accessories, high-concentration samples (max. 20wt%) and trace-volume samples (min. 15 μL) can be measured. New application fields of the SALD-7101 include nano-technology, life science and nano-bubbles.

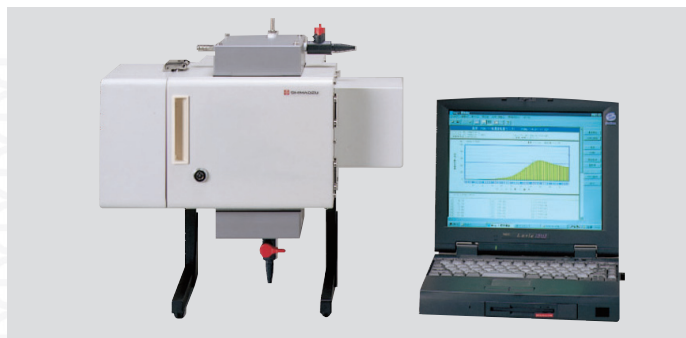
- Measurement range: 10nm to 330 μm
- Light source: UV semiconductor laser (375 nm)



SALD-201V/301V **Laser Diffraction** **Particle Size Analyzer**

The SALD-301V is the first particle size analyzer in the world equipped with a violet semiconductor laser (405nm wave length). The contribution of a violet laser increases accuracy and resolution of sub-micron particle size analysis. Deep blue sub-micron particles (which absorb red laser) can be measured accurately with a violet laser. The SALD-201V and SALD-301V are compact instruments ideal for wet analysis of paints, foods, drinks, cosmetics, and pharmaceuticals.

- Measurement range : 0.25 to 350 μm (SALD-201V)
0.1 to 350 μm (SALD-301V)



LATS-1 **Liquid Analyzer for Turbidity and Size**

The LATS-1 has two measurement functions: the high-sensitive turbidimeter and the ultra-high-sensitive particle size analyzer. The presence of pathogenic microbes such as Cryptosporidium in water can be monitored in terms of turbidity and particle size.

- Measurement range of turbidity : 0 to 2 NTU (resolution : 0.001NTU)
- Measurement range of particle size distribution : 0.5 to 50 μm



JQA-0376

Founded in 1875, Shimadzu Corporation, a leader in the development of advanced technologies, has a distinguished history of innovation built on the foundation of contributing to society through science and technology. We maintain a global network of sales, service, technical support and applications centers on six continents, and have established long-term relationships with a host of highly trained distributors located in over 100 countries. For information about Shimadzu, and to contact your local office, please visit our Web site at www.shimadzu.com



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