



# Shimadzu Scientific Instruments and Equipment

General Products Brochure



Your best partner,  
helping your business succeed

# Shimadzu Scientific Instruments and Equipment

Providing total solutions with products and services that are truly wanted

With each new generation, Shimadzu Corporation has remained committed to commercializing cutting-edge technology and providing it to customers in a wide array of industries.

Now in the 21st century, we at Shimadzu Corporation will build on the technical foundation we have established to introduce even more new solutions, faster than ever, for the field of environmental measurement, as well as the R&D and quality control fields of pharmaceuticals, food products, semiconductors, and life science industries.

In this ever-changing landscape of industries and increasingly intense global competitive environment, Shimadzu is committed to helping businesses succeed by offering “total solutions”, with products and services customers truly want.

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## 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.

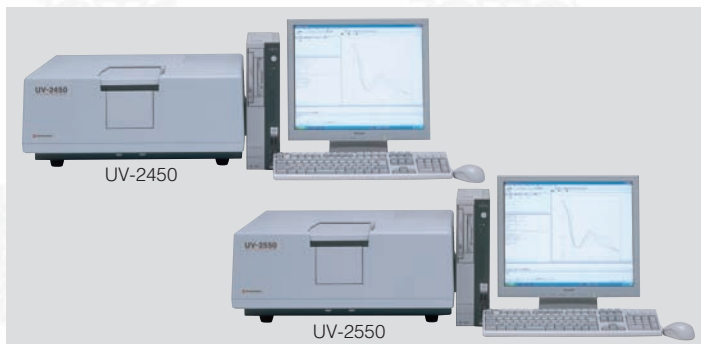


### UV-1800 UV-VIS Spectrophotometer

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

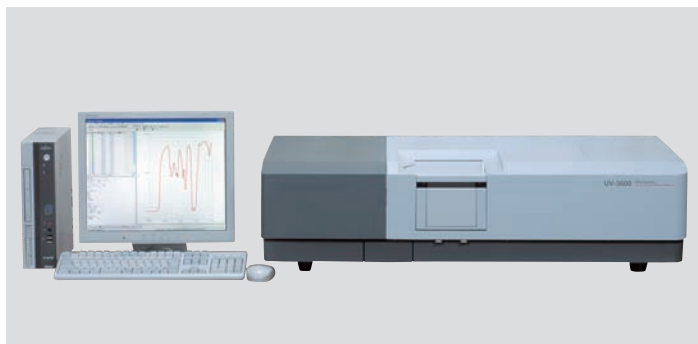


### UV-2450, UV-2550 UV-VIS Spectrophotometers

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



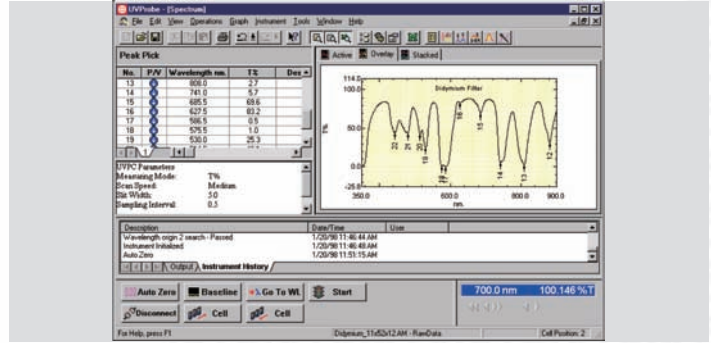
### UV-3600 UV-VIS-NIR Spectrophotometer

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.



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

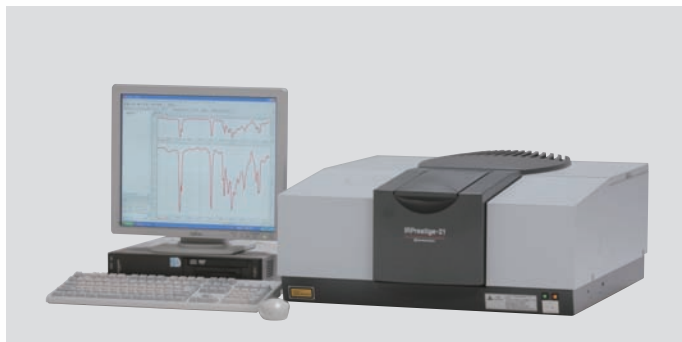
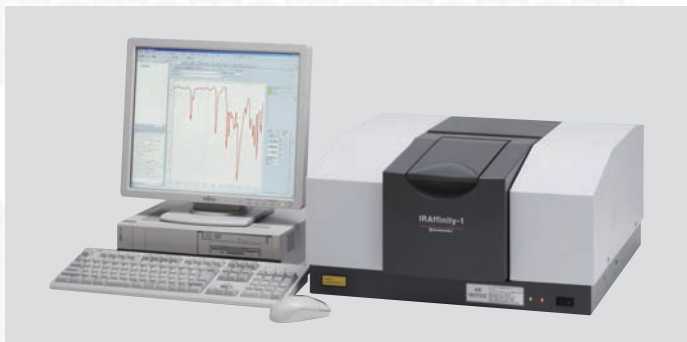
Shimadzu's SolidSpec-3700/3700DUV is a top-of-the-line spectrophotometer with high sensitivity, deep UV measurement and a large sample compartment. The SolidSpec-3700/3700DUV responds to the requirements in optical, semiconductor and FPD applications by incorporating an integrating sphere and three detectors – 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.



### UVProbe Software Package for UV-VIS Spectrophotometer

This 32-bit package, for use with the UV-1800, 2450, 2550, 3600, and SolidSpec-3700/3700DUV UV-VIS spectrophotometer series, has been designed to accommodate every level of operation, from beginner to advanced users. The software has the ability to show or hide any screen element to fit the users essential operating needs for their specific application. The security feature allows the administrator to determine which operations a particular user group can perform, and logs the user's name along with the operation in the history of the data set. Processing capabilities and robust report generation provide the ultimate tool for your UV-VIS analyses.

## Infrared Spectrophotometers



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

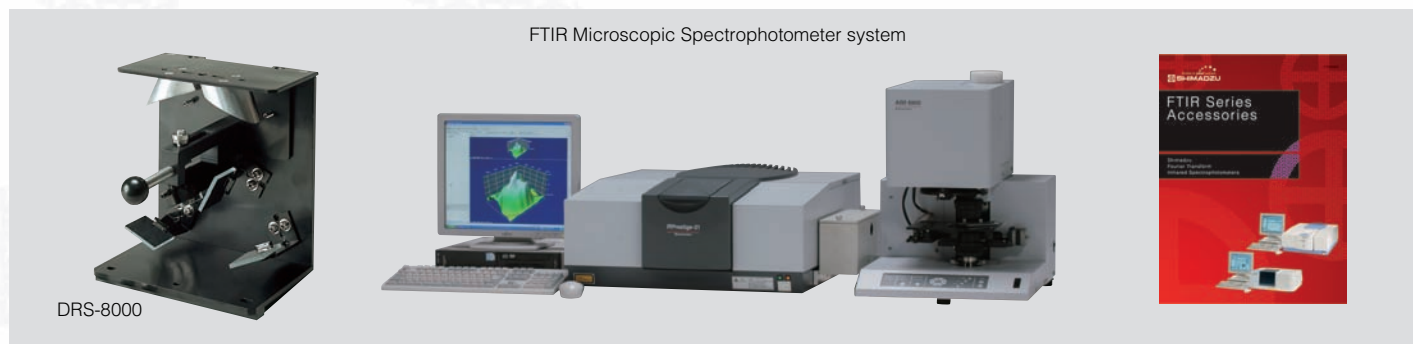
Both the IRAffinity-1 and IRPrestige-21 are PC-controlled Fourier transform infrared spectrophotometers operating under the Microsoft® Windows XP™-based IRsolution software. IRsolution software provides outstanding ease of use with a high level of processing functions such as ATR correction, Kramers-Kronig 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<sup>-1</sup>)
- Wavenumber range: 7800cm<sup>-1</sup> to 350cm<sup>-1</sup>

#### IRPrestige-21

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



### A Wide Variety of Options Widen the Application Fields

The Shimadzu IRAffinity-1 and IRPrestige-21 instruments are designed to accept various types of attachments and software to meet your needs.

Typical applications available through the use of options include diffuse reflectance measurement, total reflectance measurement, and IR microscopy, as well as routine jobs of various types.

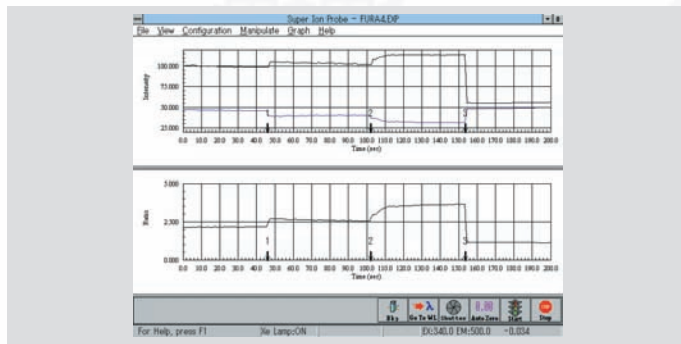
- The sample compartment is large enough to accept various types of attachments.
- The measuring beam can be taken out to an IR microscope or the second sample compartment.
- Using the AIM-8800 Automatic Infrared Microscope, samples as small as 10mm can be measured with high sensitivity.

## Spectrofluorophotometers



### **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.



### **The RF-5301PC Intracellular Ion Analysis system**

The RF-5301PC Intracellular Ion Analysis System consists of the RF-5301PC and the Super Ion Probe Software as well as a water circulator and a syringe adapter. The RF-5301PC boasts high sensitivity with up to 4 wavelength measurements. MS Windows-based Super Ion Probe Software provides a user-friendly interface and ease of operation.

## Atomic Absorption / Flame Emission Spectrophotometers



### **AA-6800** **Atomic Absorption Spectrophotometer**

The AA-6800 is a complete PC-controlled Atomic Absorption Spectrophotometer incorporating easy-to-use "AA Wizard" software. Two types of atomizers, graphite furnace and flame, are designed for outstanding high sensitivity with the choice of two background correction methods: SR (self reversal) and D<sub>2</sub> (deuterium) lamp, both approved by the US EPA. The AA-6800 offers automatic switching of flame and furnace. Furthermore, the ASC-6100 autosampler enables advanced sample pretreatment such as automatic dilution and matrix modification with automatic mixing for both flame and furnace modes.



### **AA-6300** **Atomic Absorption Spectrophotometer**

A next-generation double-beam system which drastically reduces the noise of a double-beam optical system through the adoption of a high-throughput dynamic beam manager system and a high-speed operation digital filter. In addition to the automated control of the flame gas flow rate conditions, the burner head height can be automatically controlled as well. The optimal parameters for each element/sample can be set automatically to enable continuous measurement.



### **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<sub>2</sub> background correction. The AA-6200 uses the least linear bench space of any Atomic Absorption Spectrophotometer in the world.



## 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-7000 Benchtop Type, Sequential Plasma Spectrometer

From environmental samples to food and medical supplies containing a high concentration of minerals, multiple elements can be analyzed with the simple pretreatment of samples.

The ICPS-7000 achieves the drainage standard with 40 MHz of high-frequency power and an axial direction observation system. It corresponds with the use of the Ultrasonic nebulizer UAG-1 (option) within the waterworks system and the environmental standards that require more consideration than before.



### 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



### 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

## Emission Spectroscopic Apparatus



### PDA 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 : 400mmdia x 400mmH (Ltype)  
150mmdia x 400mmH (Stype)

## X-ray Spectroscopic Apparatus



### **XRF-1800** **Sequential X-Ray Fluorescence Spectrometer**

The XRF-1800 provides local analysis and 250 $\mu$ 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 :
  - sO ~ 92U with LiF, PET, Ge and TAP analyzing crystal
  - 4Be~7N with optional analyzing crystal
- X-ray tube : 4kW with a thin window
- 250 $\mu$ 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 : sB, sC, 7N, sO ~ 92U
- Converging system : Curved crystal
- X-ray tube : 4kW with a thin window



### **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 N<sub>2</sub>
- Sample size : 300mm dia x 150mm height (max.)



### **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.

## Surface Analysis Apparatus



### **EPMA-1600 / 1610**

#### **Electron Probe Micro Analyzer**

The Electron Probe Micro Analyzer (EPMA) conducts non-destructive analysis by irradiating the sample surface with a finely focused electron beam to determine the element composition at minute scales. By simultaneously detecting the signals for secondary, reflected and transmitted electrons, characteristic X-rays, and cathode luminescence, the EPMA allows minute-scale surface observation, qualitative and quantitative analysis, as well as state, line and mapping analysis of all elements from  ${}^4\text{Be}$  to  ${}^{92}\text{U}$ . Acceptable maximum sample size is 100 x 100 mm and any position or field setting within a 90 x 90 mm range is possible. The EPMA is used for R&D and quality control in a wide variety of fields, including metals, semiconductors, ceramics, minerals, polymers, and biological specimens.



### **SUPERSCAN SS-550/SSX-550**

#### **Scanning Electron Microscope**

The SUPERSCAN SS-550 is a PC-SEM working under Windows. A Eucentric 5-axis motor stage is equipped as standard under CPU control. Even samples with no conductivity can be observed without vapor deposition through low acceleration voltages from 0.5 to 30KV in 10V steps. A low vacuum option is also available. The SUPERSCAN SSX-550 is an SEM-EDS combined system which achieves an ergonomic integrated operation environment from SEM observation to EDS analysis. The SUPERSCAN SS-550/SSX-550 are designed to afford ease of use in conjunction with high-level functions.



### **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.

## Gas Chromatograph - Mass Spectrometer



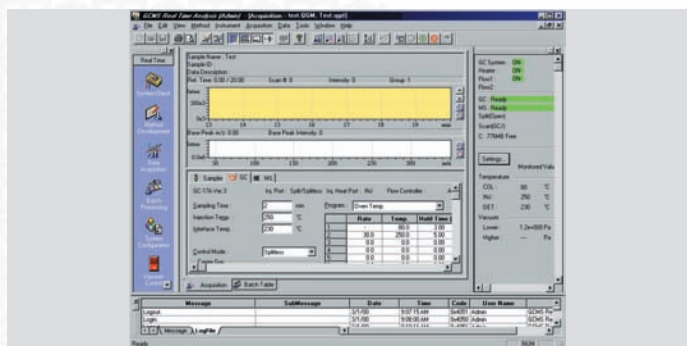
### Direct Inlet Kit (option) Gas Chromatograph - Mass Spectrometer System

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.

### 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.



### GCMSsolution Workstation for GCMS

GCMSsolution, our 32-bit software, provides the tools you need to be more productive. All operations are driven from an intuitive graphical interface to take advantage of Windows.

- GLP/GMP compliance and QA/QC
- Security (Log-in, User and Group authority assignment), Audit trail, System check, Software integrity and System suitability test are included as standard functions.
- Friendly and easy operation
- The Assistant Bar provides quick and easy access for the desired operation. The Wizard function assists you in setting otherwise complicated operation parameters, compound tables, etc.
- Flexible report generator
- Prepare analytical reports in the desired format. You can use either predefined or our own personal report templates.



### 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.

## Gas Chromatographs



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

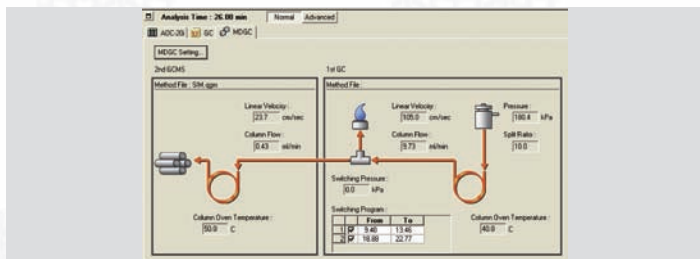
Connectable columns : Capillary columns with an inner diameter of 0.1 to 0.53 mm (If the detector is a GCMS, the outlet flow rate must not exceed 15 mL/min.)

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.

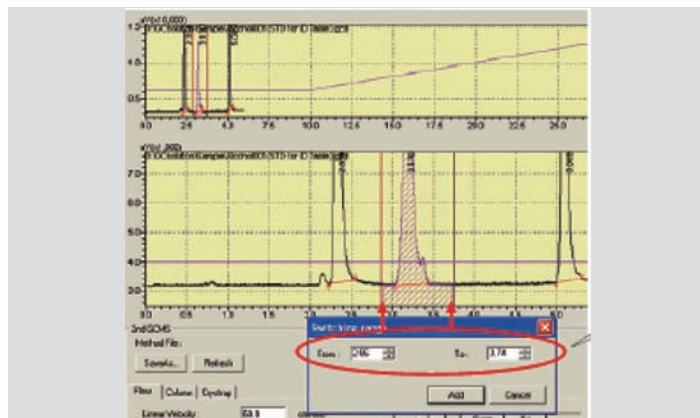
This system enhances separation performance for trace components in multi-component samples and is designed for a variety of applications, such as research and quality control in the fields of petroleum analysis, fragrance components, fine chemicals, and environmental substances.

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+AOC-20i/20s (Auto injector & sampler are optional accessories.)

- 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 Series High-end Capillary Gas Chromatograph System

The GC-2010 is a top-of-the-line product, with superior performance and functions, and is easy to operate and maintain.

The GC-2010 responds to recent requirements for higher analytical productivity and efficiency with high-speed analyses capabilities and by reduction of time loss.

The GC-2010 is equipped with, for high-speed analysis, the Shimadzu third-generation AFC, which is compatible with high-pressure and high-split (ratio) operation, and fast data acquisition at 4ms.

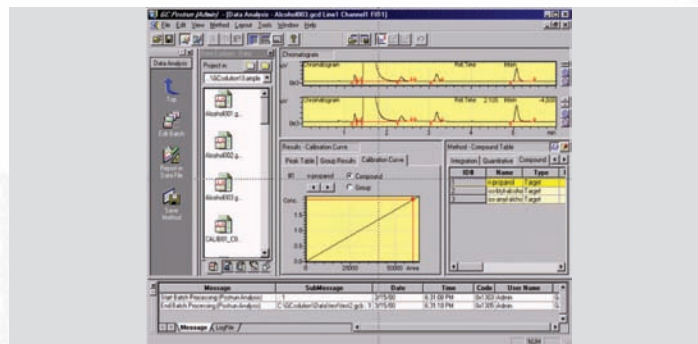
The self-diagnostics function helps preventive maintenance work to keep the system at optimum conditions at any time.



## 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)



## 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.

## Gas Chromatographs



### **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-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-5000** **Liquid Injection / Headspace Injector**

The AOC-5000 is designed as an ideal front end automation for Gas Chromatography, and it is the only GC sample injection system that combines liquid, large volume and headspace injection in one single instrument. Large volume injection (LVI) allows users to inject samples up to 250  $\mu$ L without the usual degradation in chromatographic performance.

In headspace injection mode, the syringe injection with the robotic vial processing operation allows sample analysis in a straightforward and simple way. No complicated error-prone operations, e.g. vial pressurization, valve switching, loop filling or heated transfer lines, are involved. Dead volume and adsorption effect are eliminated. Adjustable sample volumes without sample loop changes are possible. No sample dilution is required.



### **GC-20B Series** **Automated Gas Chromatograph**

The GC-20B series is an automated gas chromatograph for gas samples. All the operations, selection of samples, sampling, analysis, data processing and report preparation are performed automatically, in combination with a data processing unit.

The GC-20B series is available in three models – GC-20B-1 for flue gas analysis, GC-20B-3 for fuel gas analysis and GC-20B-4 for trace hydrocarbon analysis.



## Liquid Chromatographs



### **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.

## Liquid Chromatographs



### **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.



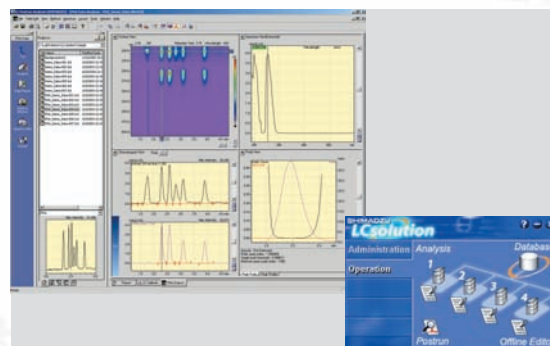
## Prominence UFLC Ultra Fast Liquid Chromatograph

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 (LCsolution or CLASS-VP) 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.



## LCsolution Workstation for Shimadzu HPLC

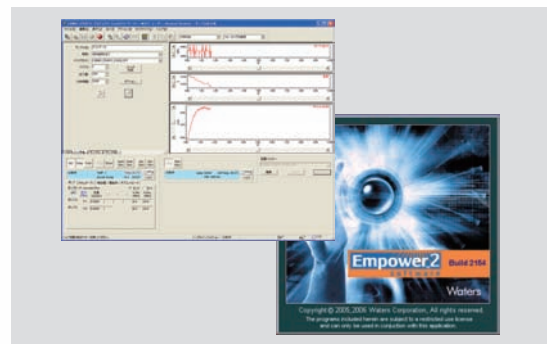
Shimadzu's LCsolution software offers an intuitive easy-to-use operating environment and sets a new standard for laboratory productivity in the 21st century by offering new and innovative solutions to meet the challenges of high sample throughput, instrument control, diverse data handling, and integration 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.

## 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.



### 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.



### 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-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.)



**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)



**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

## Liquid Chromatographs



### 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  $\mu\text{L}$  (standard), 1 to 2000  $\mu\text{L}$  (option)  
Sample temperature control:  
SIL-20A: none  
SIL-20AC: 4 to 40°C



### 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  $\mu\text{L}$  (standard), 1 to 100  $\mu\text{L}$  (option)



### SIL-20AHT/20AHT UFLC Prominence UFLC Autosampler

The SIL-20AHT/20AHT is a grade-up version of the SIL-20A/20AC, with maximum applicable pressure extended to 35 MPa. Basic specifications, including injection volume accuracy, precision, carryover and durability, are same as those of the SIL-20A/20AC.  
Injection method: Total-volume sample injection, variable injection volume  
Injection-volume setting range: 0.1 to 100  $\mu\text{L}$



### 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 ( $\text{D}_2$ ) lamp  
Wavelength range: 190 to 700 nm



### 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:  $\text{D}_2$  lamp  
SPD-20AV:  $\text{D}_2$  lamp, W lamp  
Measuring wavelength range  
SPD-20A: 190 to 700 nm  
SPD-20AV: 190 to 900 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:  $\text{D}_2$  lamp, W lamp  
Measuring wavelength range: 190 to 800 nm



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

Ideal for fixed-loop measured sample injection, injection of 500  $\mu\text{L}$  or more, and automatic pretreatment.

Injection Method: Adjustable injection volume or fixed loop sample injection

Injection volume: 1 to 5000  $\mu\text{L}$  (pretreatment function increases this by N times) (Optional equipment required for 150  $\mu\text{L}$  or more.)

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

Racks, vials, and cooler are sold separately.



### 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



### 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:  $0.25 \times 10^{-8}$  RIU

Drift:  $10^{-7}$  RIU/hr

Max. flowrate: 20 mL/min

(150 mL/min using option)



### RF-10AXL/10AXL Super Fluorescence Detector

The refined optical design considerably enhances the signal-to-noise ratio. A top-class wavelength accuracy of  $\pm 2.0$  nm and a wavelength reproducibility of  $\pm 0.2$  nm are guaranteed. Permits wavelength programs and wavelength scans.

Light source: Xenon lamp

Measuring wavelength range:

200 to 650 nm (to 900 nm using option)

Sensitivity: S/N >300

(using Raman line for water)



### 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



### 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.



### Ion Chromatograph Prominence HIC-SP

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.



### Ion Chromatograph Prominence HIC-NS

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 $\mu$ S/cm full scale
- Flow rate control range : 0.001 ~ 5mL/min

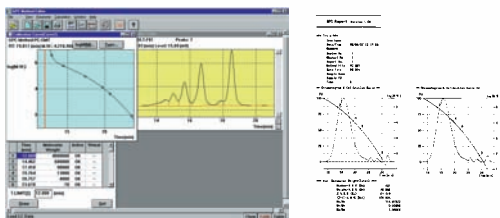


### PIA-1000 Personal Ion Analyzer

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.





### 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.



### Organic Acid Analysis System

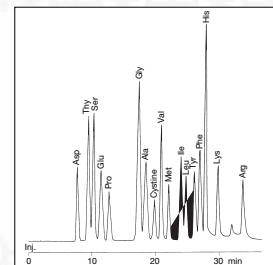
Selectively detects organic acids with high sensitivity, using Shimadzu's unique pH buffering post-column electroconductivity detection technology (patented).

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



### 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.



### 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-10AXL, LCsolution, and others.

## Liquid Chromatographs



### 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-20A5, SIL-20AC, CTO-20AC, CRB-6A, RF-10AXL, LCsolution, and others.



### Large-Scale Preparative Chromatograph LC-8A System

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.



### Biological Sample Analysis System Prominence Co-Sense for BA

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 makes complicated pretreatment processes unnecessary and provides significant increases in productivity for life sciences research.

- Instruments Included in the Example Shown  
CBM-20A, LC-20AB, LC-20AD x 2 units, DGU-20A5, SIL-20AC, CTO-20AC, FCV-12AH, SPD-20A, LCsolution, and others.



### 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.

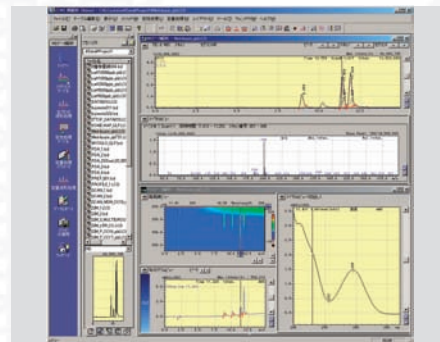
The SIL-HT was developed to meet such users' requirements. The SIL-HT is available in two versions: SIL-HTA without sample cooler, and SIL-HTC with sample cooler.



### 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.

## Liquid Chromatograph - Mass Spectrometer



### **LCMS-2010EV** **Liquid Chromatograph Mass Spectrometer**

The LCMS-2010EV offers high sensitivity due to the Angle Spray interface (patented in Japan and overseas) and Q-array ion guide, and high stability thanks to the ion guide system featuring the Block Heater (Pat. Pending).

It fully supports the Shimadzu Prominence (LC-20A) Series liquid chromatograph, LC-2010HT, and LC-VP Series and permits the configuration of diverse LC/MS systems for a variety of applications.

Ionization method: ESI (Standard), APCI, APPI, DUAL ESI/APCI (Optional)

Mass range: 10 to 2,000 m/z

Resolution: R = 2M

Sensitivity: ESI, reserpine 10 pg S/N > 500 (RMS), Flow injection, SIM mode

Scan speed: 6,000 amu/s max. (Centroid Scan), 4,000 amu/s max. (Profile Scan)

Software: Multi sequence mode function, Auto-tuning

\*Optional LCMS Pesticide Library is available. (93 Pesticides are registered.)

### **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.



### **PsiPort Browser** **Applied LCMS System** **Web-based Analytical/ Preparative LCMS system**

PsiPort Browser is Web-based software that runs on LCMSsolution. It is a tool that allows multiple users to use LC/MS as a preparative tool and to check the purity of synthetics. The LC/MS system administrator handles the mass spectrometer settings, allowing the user to conduct analysis and browse the results from any location with the sensation of operating an internet browser.

PsiPort Browser allows the flexible configuration of high-throughput analysis systems and preparative LC/MS systems.



### **Co-sense for BA + LCMS + 2010EV** **Applied LCMS System** **Biosample Analysis System**

This system configuration, employing column-switching technology and the unique pretreatment column, allows the direct injection and analysis of biosamples, such as blood plasma and blood serum. Using MS as the detector achieves high productivity and permits high-sensitivity, high-throughput batch analysis.



### **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 MS<sup>n</sup> 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.

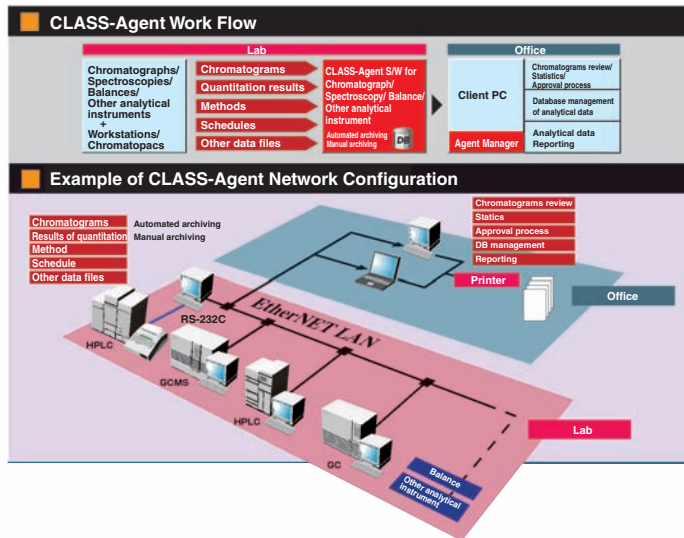
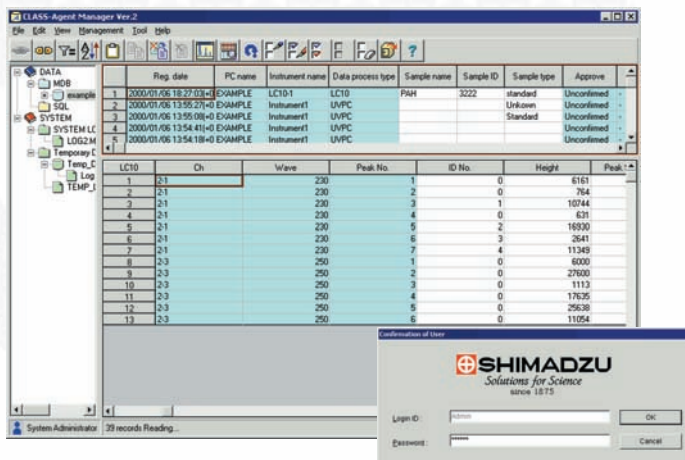
Mass range MS: m/z 50 to 5,000

Mass range MS<sup>n</sup>: 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

## 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.



### LIMSolution

Shimadzu's LIMSolution 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.

## Fine Particles and Powder Analyzers



### **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 $\mu$ m (SALD-201V)  
0.1 to 350 $\mu$ m (SALD-301V)



### **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  $\mu$ m
- 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 $\mu$ m
- Light source : Red semiconductor laser (wavelength: 680 nm)

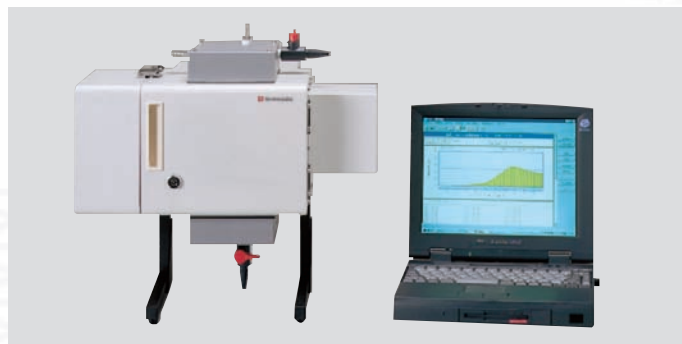


### **SALD-7101** **Nano Particle Size Analyzer**

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 $\mu$ L) can be measured. New application fields of the SALD-7101 include nano-technology, life science and nano-bubbles.

Measurement range: 10nm to 330 $\mu$ m

Light source: UV semiconductor laser (375 nm)



### **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 $\mu$ m

## 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 :  $\pm 40$ 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 :  $\pm 40$ mW
- Noise level : 1 $\mu$ 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 $\pm 500$ mg, DTA $\pm 1000$   $\mu$ 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 $\pm 500$ mg, DTA $\pm 1000$   $\mu$ 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 :  $\pm 5\text{mm}$   
Load :  $\pm 5\text{N}$
- Sample size :  $\varnothing 8 \times 20\text{mm}$ ,  $5 \times 1 \times 20\text{mm}$  (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  $\mu\text{g}$  order ( $10\mu\text{g}$  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 :  $\pm 20\text{mg}$ ,  $\pm 200\text{mg}$ , (only  $\pm 2000\text{mg}$  (51-models) only)
- Maximum sample weight :  $1\text{g}$  (tare weight)/  
 $10\text{g}$  (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 :  $\pm 0.2$  to  $\pm 1000\mu\text{V}$  (from a minimum of  $\pm 0.2\text{mW}$ )
- Heating speed :  $0$  to  $\pm 50^\circ\text{C}/\text{min}$ .



### **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.

## 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 - 30,000
Detection limit	4µg/L	50µg/L	4µg/L	50µg/L
Sample Injection	Automatic injection			

### 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



### 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



### 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.



### 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)



**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**  
**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

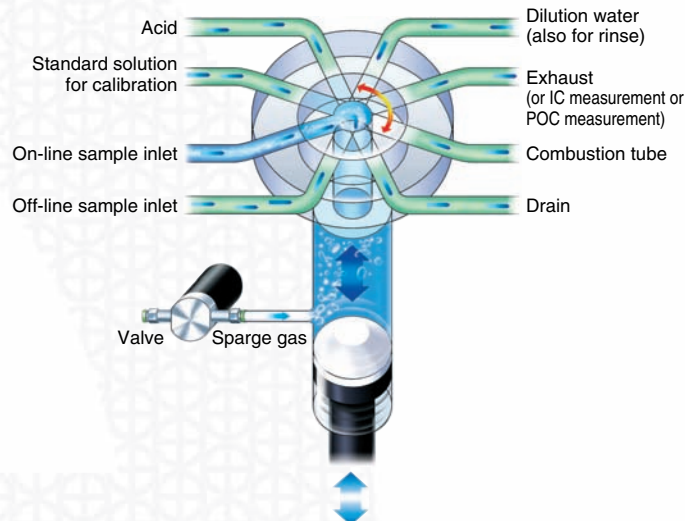


**4110 Series**  
**On-line Total Organic Carbon & Total Nitrogen Analyzer**

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<sub>x</sub>, SO<sub>2</sub>, CO, CO<sub>2</sub>, CH<sub>4</sub>, O<sub>2</sub> 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 <sub>x</sub> -O <sub>2</sub> Chemiluminescence Gas Monitor	CO/CO <sub>2</sub> /CH <sub>4</sub> Infrared Gas Monitor	SO <sub>2</sub> Infrared Gas Monitor
Range	NO <sub>x</sub> : 0-25/50/100/250/500/1000/2500/4000ppm O <sub>2</sub> : 0-5/10/25 vol%	CO: from 0-100ppm to 0-100vol% CO <sub>2</sub> : from 0-1000ppm to 0-100vol% CH <sub>4</sub> : from 0-200ppm to 0-100vol% O <sub>2</sub> : 0-5/10/25vol% (option)	SO <sub>2</sub> : 0-100ppm to 0-1vol% O <sub>2</sub> : 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<sub>x</sub>, SO<sub>2</sub>, and CO or CO<sub>2</sub>. An O<sub>2</sub> detector is also incorporated to allow measurement of a total of the five components simultaneously.

- Application:  
Measurement of NO<sub>x</sub>, SO<sub>2</sub>, CO, CO<sub>2</sub>, and O<sub>2</sub> concentrations in exhaust gases from various boilers, industrial plants (petroleum refinery, steel, cement, etc.), incinerators, and thermal treatment furnaces.

## Balances

### Shimadzu UniBloc Technology

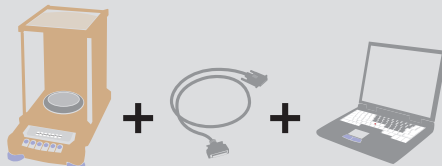


## Shimadzu's Unique Features

### 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.

### Windows® Direct



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.

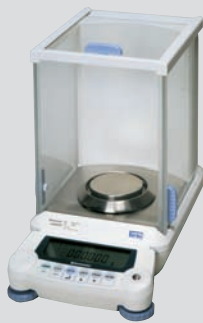
## Shimadzu's UniBloc Balances

### 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

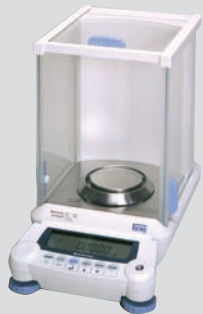
Model	Capacity	Minimum display	PSC	Clock-CAL	GLP/GMP/ISO calibration report	Windows Direct
AUW220D	220g/82g	0.1mg/0.01mg	●	●	●	●
AUW120D	120g/42g	0.1mg/0.01mg	●	●	●	●
AUW320	320g	0.1mg	●	●	●	●
AUW220	220g	0.1mg	●	●	●	●
AUW120	120g	0.1mg	●	●	●	●
AUX320	320g	0.1mg	●		●	●
AUX220	220g	0.1mg	●		●	●
AUX120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



AUW-D



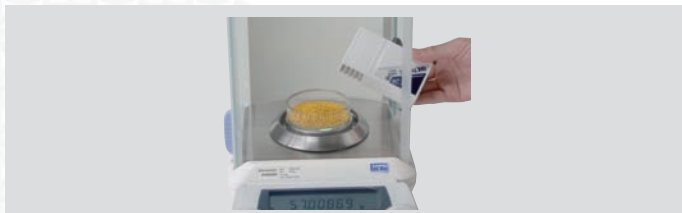
AUW



AUX



AUY



## Static Remover

### STABLO-EX

NEW  
Shimadzu's unique  
2-WAY ionizer

Hand-held / On stand

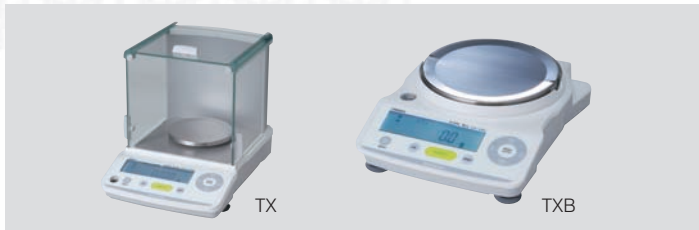
## Balances



### 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	●



## 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.

## 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 N<sub>2</sub> 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 N<sub>2</sub> 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 N<sub>2</sub> 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

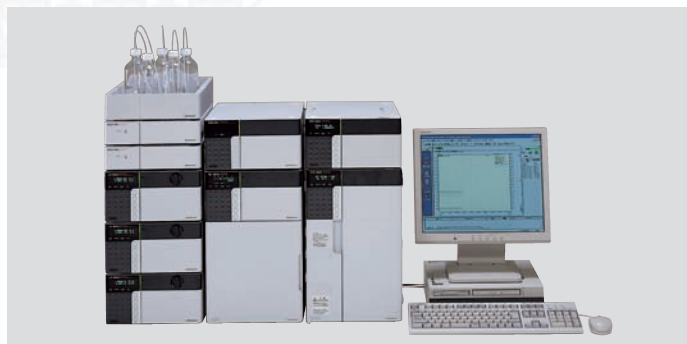


### AXIMA-QIT™ - Solving the next generation of proteomics problems

#### MALDI-QIT-TOF Mass Spectrometer

A unique mass analyzer combining the simplicity of MALDI, the power of MS<sub>n</sub>, and the accuracy and resolution of TOF for the next generation of structural analysis problems, it can be used to determine protein sequence, proteoglycans, carbohydrates, etc. The AXIMA-QIT™ is a unique hybrid instrument employing: Matrix assisted laser desorption ionization (MALDI) and Quadrupole ion trap (QIT).

## Biotechnology Instruments



### 2D Micro-HPLC System For Proteome Analysis

The high-performance 2D micro-HPLC system can perform separation of complex peptide mixtures with a level of sensitivity and resolution that meets or exceeds present-day requirements. Combining cation exchange chromatography in the first dimension and capillary reversed-phase chromatography in the second dimension, using 6 trap columns, allows for the various separation conditions to be optimized independently. When this system is coupled with a high-performance mass spectrometer with an electrospray ionization interface (ESI), unparalleled performance and sensitivity can be achieved.



### 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 Biotech's AXIMA MALDI-TOF instruments, proteome analysis can be performed with a higher degree of precision and with greater sequence coverage.



### 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.

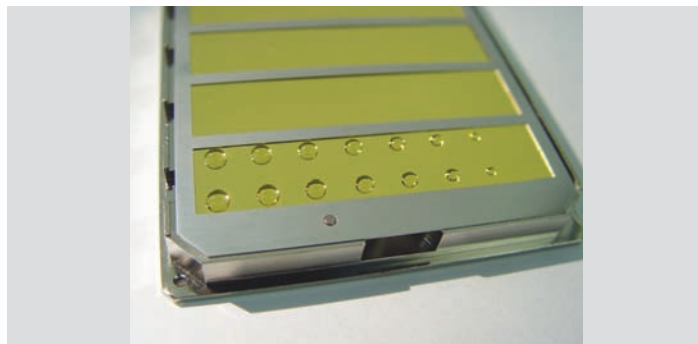
## Biotechnology Instruments



### **<sup>13</sup>C 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.



### **FocusMass-T3 High Sensitivity Sample Plates for MALDI-TOF-MS**

FocusMass-T3 are disposable sample plates with a special chemically treated surface. They allow concentrating/condensing larger volume sample solutions to achieve 10 to 100 times higher sensitivity, making them ideal for measuring samples with only trace amounts of a target substance.

- Able to concentrate 20  $\mu$ L quantities of sample solution
- Ideal for identifying proteins present in trace quantities
- Compatible with all AXIMA series systems, such as AXIMA-CFR plus and QIT.

\* If an initial purchase, also order the holder kit and FocusMass-T3 Reagent Kit.



### **Progenesis Gel Image Analysis Software**

This software is for analyzing electrophoresis gel images. It uses state-of-the-art algorithms to detect spots with high precision and even correct for deflection. It includes a variety of analytical tools and fully automated analysis features to provide an easy-to-use operation for the user. A wide range of products are available for different testing applications. A DM version is available that includes database features.

\* A PC satisfying the specification is required separately.



### **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 $\mu$ L cell
- Installed with utility program

Calculation of nucleic acid molecular weight and molar absorbance coefficient ( $\epsilon$ ), and  $T_m$  estimation by the nearest base pair model are possible.





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

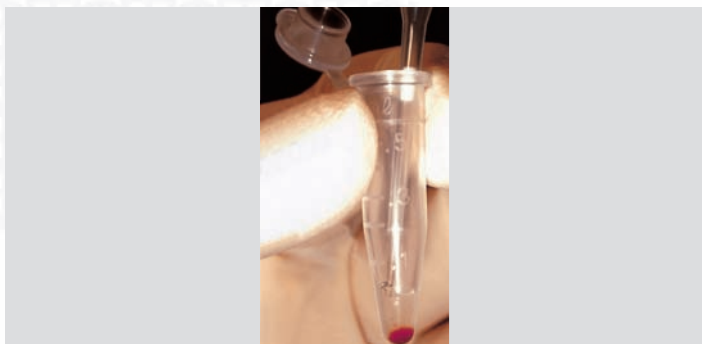
A fully PC-controlled protein sequencer, PPSQ-31A/33A systems are equipped with a specially designed, novel and precise reagent delivery system for the reproductive gas-phase Edman degradation cycles. The PPSQ-31A/33A consists of an Edman reaction unit, an on-line PTH-amino acid analyzer with an LC pump 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.



### **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 µL are possible with the special 8-cell microcell. It includes all-in-one PC software.

- Temp. Control Range: 0.0 °C to 110.0 °C
- Temp. Change Rate: ±0.1 °C to 5.0 °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 NovaTaq Hot Start DNA Polymerase DNA Amplification Reagent**

(500 tests at 20-µL)

The effect of PCR inhibitors is controlled so DNA extracts require no purification procedures. Pretreatment of mouse tail genotype is finished only 10 minutes after the tail is added to the solution. These reagents can be used for a wide range of PCR applications such as plant matter, blood, paraffin sections, or oral mucous membrane cells.



### **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

## Shimadzu Global Sales and Customer Support Network

Shimadzu is a player on the world stage. Based on a 5-block overseas network consisting of North America, Central and South America, Europe, China, and Asia-Oceania, we have established marketing and production bases all over the world. Our business structures that can respond to the varying needs of different countries and regions, and are actively working towards greater internationalization of technological development through greater cooperation in the areas of research, development, and marketing. Shimadzu is striving to develop business in a way that reflects the importance of our partnerships with customers all over the world.

Regarding the global issue of environmental conservation, we produce a wide variety of environmental products, such as exhaust-gas analyzers and water-quality monitoring systems, and actively promote their production overseas.



- Overseas subsidiaries
- Overseas offices
- Joint ventures
- Customer support centers

## in U.S.A



Shimadzu Scientific Instruments, Inc.



Shimadzu Precision Instruments, Inc.

In the U.S.A., we are promoting business activities in a way that reflects the importance of our partnerships with customers. Shimadzu's powerful sales capability and comprehensive after-sales service and technical support in developing nations are highly regarded. Based on this reputation, we offer global account programs to pharmaceutical and chemical corporations in the U.S.A. that have production bases around the world, and have entered into global contracts for liquid chromatographs and others products.

## in Asia



Shimadzu (Asia Pacific) PTE. LTD.



Shimadzu (Suzhou) Instruments Manufacturing Co., Ltd.

We supply industrial equipment for a variety of purposes, such as the manufacture of glass and polymer fiber, to various parts of Asia, a region that has been called "the world's factory." In Korea and Taiwan, there has been significant growth in the market for semiconductor and FPD equipment. In the target area of China, keeping pace with government-backed measures to protect the environment, we are pushing forward with local production of environmental measurement instruments for the Chinese market.



Shimadzu Philippines Manufacturing Inc.

## in Europe



Kratos Group PLC.UK



Shimadzu Deutschland GmbH

In addition to developing our business interests through establishing local corporations in the U.K., Germany, Italy, and Austria, we are actively exploring the markets for medical, analytical, and environmental equipment in the CIS (the former Soviet Union) and Eastern Europe. In particular, following the establishment of the Moscow office, we set up new bases at other locations in the CIS. In the field of technological development, we are promoting international joint research and development at Shimadzu Europe's research laboratory in Manchester, U.K., which boasts cutting-edge technology for optical and mass spectrometry.

## Shimadzu's Customer Support



In order to quickly adapt to the specific needs of customers in any country or region for any product, Shimadzu has created a network for sales and after-sales service at 250 locations around the world. We hold detailed technical discussions with our customers during which we provide the latest measurement technologies and applications, and ensure that information is disseminated effectively by holding technical seminars and workshops.



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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](http://www.shimadzu.com)



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