



State of West Virginia  
 Department of Administration  
 Purchasing Division  
 2019 Washington Street East  
 Post Office Box 50130  
 Charleston, WV 25305-0130

# Request for Quotation

|            |
|------------|
| RFQ NUMBER |
| AGR0926    |

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|------|
| PAGE |
| 1    |

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|--|
| ADDRESS CORRESPONDENCE TO ATTENTION OF |
| RON PRICE<br>304-558-0492              |

VENDOR

\*709032209 410-381-1227  
 SHIMADZU SCIENTIFIC INSTRUMENT  
 7102 RIVERWOOD DRIVE  
  
 COLUMBIA MD 21046

SHIP TO

DEPARTMENT OF AGRICULTURE  
 BUILDINGS & GROUNDS DIVISION  
 BUILDING 17  
 4720 BRENDA LANE  
 CHARLESTON, WV  
 25312 304-558-2221

|              |               |          |       |               |
|--------------|---------------|----------|-------|---------------|
| DATE PRINTED | TERMS OF SALE | SHIP VIA | F.O.B | FREIGHT TERMS |
| 05/07/2009   |               |          |       |               |

BID OPENING DATE: 05/28/2009 BID OPENING TIME 01:30PM

| LINE  | QUANTITY | UOP | CAT NO | ITEM NUMBER | UNIT PRICE               | AMOUNT                   |
|---|----------|-----|--------|-------------|--------------------------|--------------------------|
| 0001  | 1        | EA  |        | 493-11      | \$ 41,026. <sup>84</sup> | \$ 39,620. <sup>43</sup> |
| <p>GAS CHROMATOGRAPH</p> <p>GAS CHROMATOGRAPH (GC) SYSTEM WITH DUAL ELECTRON CAPTURE DETECTORS (ECDs); SPLIT/SPLITLESS CAPILLARY INJECTOR WITH ELECTRONIC FLOW CONTROL; AUTOINJECTOR TOWER WITH CAROUSEL; DESKTOP COMPUTER WITH MOST CURRENT VERSION OF WINDOW XP, DELL DIMENSION, OR EQUIVALENT, MINIMUM 2 GB RAM, MINIMUM 10 GB HARD DRIVE STORAGE, 12-24X CD ROM, 17" FLAT PANEL MONITOR, 2 BUTTON MOUSE WITH SCROLL, KEYBOARD, INTEGRATED ETHERNET, MINIMUM 3 USB PORTS, COLOR INKJET PRINTER, GC, AUTOSAMPLER, AND DATA HANDLING OPERATING SOFTWARE LOADED ONTO THE COMPTER; RESTEK OR EQUIVALENT RTX-PESTICIDE 1 AND RTX-PESTICIDE 2 COLUMNS, 30 M; UNIVERSAL ANGLED "Y" PRESS-TIGHT CONNECTOR.</p> <p>ADDITIONAL SPECIFICATIONS ARE ATTACHED</p> <p>ALL BIDDERS SHOULD PROVIDE COPIES OF SPECIFICATION SHEETS WITH THEIR BID.</p> <p>NOTICE</p> <p>A SIGNED BID MUST BE SUBMITTED TO:</p> <p>DEPARTMENT OF ADMINISTRATION<br/>         PURCHASING DIVISION<br/>         BUILDING 15<br/>         2019 WASHINGTON STREET, EAST<br/>         CHARLESTON, WV 25305-0130</p> |          |     |        |             |                          |                          |

RECEIVED  
 2009 MAY 22 AM 9:21  
 WV PURCHASING  
 DIVISION

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

|                                  |                                 |                                   |
|----------------------------------|---------------------------------|-----------------------------------|
| SIGNATURE<br><i>Heather Juwa</i> | TELEPHONE<br>800-388-6996 X1673 | DATE<br>5-19-09                   |
| TITLE<br>Sales Engineer          | FEIN<br>52-1035956              | ADDRESS CHANGES TO BE NOTED ABOVE |

WHEN RESPONDING TO RFQ, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'



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| DATE PRINTED | TERMS OF SALE | SHIP VIA | F.O.B. | FREIGHT TERMS |
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BID OPENING DATE: **05/28/2009**      BID OPENING TIME **01:30PM**

| LINE  | QUANTITY | UOP | CAT NO. | ITEM NUMBER | UNIT PRICE | AMOUNT |
|---|----------|-----|---------|-------------|------------|--------|
| <p>THE BID SHOULD CONTAIN THIS INFORMATION ON THE FACE OF THE ENVELOPE OR THE BID MAY NOT BE CONSIDERED:</p> <p>SEALED BID</p> <p>BUYER: RP-41</p> <p>RFQ. NO.: AGR0926</p> <p>BID OPENING DATE: 5/28/09</p> <p>BID OPENING TIME: 1:30 PM</p> <p>PLEASE PROVIDE A FAX NUMBER IN CASE IT IS NECESSARY TO CONTACT YOU REGARDING YOUR BID:</p> <p>-----410-290-9140-----</p> <p>CONTACT PERSON (PLEASE PRINT CLEARLY):</p> <p>-----Heather Juzwa-----</p> <p>***** THIS IS THE END OF RFQ      AGR0926 ***** TOTAL: <u>\$39,620.43</u></p> |          |     |         |             |            |        |

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

|                                   |                                 |                                   |
|-----------------------------------|---------------------------------|-----------------------------------|
| SIGNATURE<br><i>Heather Juzwa</i> | TELEPHONE<br>820-388-6996 X1623 | DATE<br>5-19-09                   |
| TITLE<br>Sales Engineer           | FEIN<br>52-1035956              | ADDRESS CHANGES TO BE NOTED ABOVE |

WHEN RESPONDING TO RFQ, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

## WEST VIRGINIA DEPARTMENT OF AGRICULTURE

## GAS CHROMATOGRAPH SYSTEM

The West Virginia Department of Agriculture (WVDA) seeks to purchase one (1) complete gas chromatograph system. This equipment is to be purchased as a package, delivered, and installed in the Pesticide Residue Laboratory at the Gus R. Douglass Agricultural Center at Guthrie, near Charleston, WV. The system must meet the specifications indicated in the following sections.

The gas chromatograph system must have the following features as specified:

- GC with dual electron capture detectors (ECDs)
- Split/Splitless capillary injector with electronic flow control
- Autoinjector tower with carousel
- Desktop computer with the most current version of Windows XP; Dell Dimension or equivalent; minimum 2 GB RAM; minimum 10 GB hard drive storage; 12-24X CD ROM; 17" flat panel monitor; 2 button mouse with scroll; keyboard; integrated Ethernet; USB ports, 3 minimum; color inkjet printer
- GC, autosampler, and data handling operating software loaded onto the desktop computer
- Restek or equivalent RTX-Pesticide 1 and RTX-Pesticide 2 columns, 30 m
- Universal angled "Y" press-tight connector

The GC with dual electron capture detectors must have the following specifications:

1. The GC must be able to install a minimum of two injectors and at least two detectors with all standard detectors mounted under the GC top deck including FID, TCD, NPD, ECD and FPD.
2. The system sensitivity is of critical importance and the ECD detectors must meet the following minimum specifications:
  - a. ECD - Operational temperature range, minimum: up to 350°C; Detection limit, minimum: 8fg/s (g-BHC); Dynamic range, minimum: 10<sup>4</sup>
3. The column flow control must be electronically controllable from the software or GC keypad. The electronic flow control must be able to control the carrier flow in constant linear velocity mode to achieve the optimal column performance. The split/splitless injection system must be backpressure regulated to maintain the best retention time stability. All detector gases must be electronically controlled as well as the septum purge and split values.

4. The electronic flow control must have room temperature and ambient pressure compensation and have performance specifications for C12 of a minimum of 0.2 % RSD for 10 repeated injection area counts with the standard autosampler.
5. The GC and autosampler system must be able to be controlled from any location by internet TCP/IP protocol.
6. The GC oven must be capable of cool-down to enhance method productivity:
  - a. Oven must cool down from 450°C to 50°C in less than ten (10) minutes, maximum.

The autoinjector tower with carousel must have the following specifications: .....

1. The carousel must accommodate at least a minimum of 10 vials of 2 ml capacity, minimum.
2. The single tower must be capable of accessing two injectors without removal.

The hardware must have the following specifications:

1. Desktop computer with most current version of Windows XP, Dell Dimension or equivalent.
2. Minimum of: 2 GB RAM; 10 GB hard drive storage.
3. 12-24X CD ROM.
4. Minimum 17" flat panel monitor.
5. Two (2) button mouse with scroll.
6. Keyboard.
7. Integrated Ethernet required.
8. Minimum of 3 USB ports.
9. Color inkjet printer.
10. All data handling software must be loaded onto the computer.

The operating software must have the following specifications:

1. The GC must control all functions of the standard autosampler with no external connections to the data station for best reliability. The autosampler must also be controlled from the GC keypad interface including all parameters and batch processing for use flexibility.
2. Up to four GC's with up to 2 detectors each must be able to be operated by the control software.
3. All instrument controls must be from one window to include all configuration, GC analytical conditions, batch automated sample handling software to minimize initial startup training time and future user training.

## CUSTOMER SUPPORT

- **Warranty:** The warranty period shall be for a minimum of one year and include parts, labor, special services, travel, and preventive maintenance for one year from date of on-site installation at no expense to the purchaser. Quotation shall include an optional four additional years of premium service coverage for parts, labor, special services, travel, and preventive maintenance for a total of five years of service coverage. This warranty and service plan shall cover the GC instrument, hardware, and software.
- **Loaner instrumentation:** Vendor must provide loaner instrumentation, at no charge to the purchaser, during the warranted period should instrumentation need to be sent out for repairs.
- **On-site installation:** Vendor shall deliver and provide on-site installation (labor and supplies included) of the system at no charge to the WV Department of Agriculture. No freight fees shall be charged to the purchaser.
- **Post-Installation Training:** Must provide on-site method development training to cover, at a *minimum*, methods set-up and fine-tuning, quantitation and report generation. On-site training (labor and non-consumable supplies included) shall be provided until all users feel comfortable with the system and must be at no charge to the WV Department of Agriculture.
- **Service and support of the instrument:** Must be available 24 hours a day, 7 days a week for on demand calls by a technician trained by the instrument manufacturer. Technical support/assistance shall be available toll free for on demand calls as well.

## GENERAL REQUIREMENTS

- **Manuals:** Two (2) copies of all system manuals (operation, training, technical, service maintenance, etc.) shall be provided at no charge to the WV Department of Agriculture.
- **Updates/Upgrades:** For the life of the instrument, future updates/upgrades to all software must be included at no additional charge. All engineering updates and reliability enhancements for life of instrument shall be provided at no additional cost.

# VENDOR PREFERENCE CERTIFICATE

Certification and application\* is hereby made for Preference in accordance with *West Virginia Code*, §5A-3-37. (Does not apply to construction contracts). *West Virginia Code*, §5A-3-37, provides an opportunity for qualifying vendors to request (at the time of bid) preference for their residency status. Such preference is an evaluation method only and will be applied only to the cost bid in accordance with the *West Virginia Code*. This certificate for application is to be used to request such preference. The Purchasing Division will make the determination of the Resident Vendor Preference, if applicable.

N/A

- 1. Application is made for 2.5% resident vendor preference for the reason checked:  
 Bidder is an individual resident vendor and has resided continuously in West Virginia for four (4) years immediately preceding the date of this certification; or,  
 Bidder is a partnership, association or corporation resident vendor and has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; or 80% of the ownership interest of Bidder is held by another individual, partnership, association or corporation resident vendor who has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; or,  
 Bidder is a nonresident vendor which has an affiliate or subsidiary which employs a minimum of one hundred state residents and which has maintained its headquarters or principal place of business within West Virginia continuously for the four (4) years immediately preceding the date of this certification; or,
- 2. Application is made for 2.5% resident vendor preference for the reason checked:  
 Bidder is a resident vendor who certifies that, during the life of the contract, on average at least 75% of the employees working on the project being bid are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; or,
- 3. Application is made for 2.5% resident vendor preference for the reason checked:  
 Bidder is a nonresident vendor employing a minimum of one hundred state residents or is a nonresident vendor with an affiliate or subsidiary which maintains its headquarters or principal place of business within West Virginia employing a minimum of one hundred state residents who certifies that, during the life of the contract, on average at least 75% of the employees or Bidder's affiliate's or subsidiary's employees are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; or,
- 4. Application is made for 5% resident vendor preference for the reason checked:  
 Bidder meets either the requirement of both subdivisions (1) and (2) or subdivision (1) and (3) as stated above; or,
- 5. Application is made for 3.5% resident vendor preference who is a veteran for the reason checked:  
 Bidder is an individual resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard and has resided in West Virginia continuously for the four years immediately preceding the date on which the bid is submitted; or,
- 6. Application is made for 3.5% resident vendor preference who is a veteran for the reason checked:  
 Bidder is a resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard, if, for purposes of producing or distributing the commodities or completing the project which is the subject of the vendor's bid and continuously over the entire term of the project, on average at least seventy-five percent of the vendor's employees are residents of West Virginia who have resided in the state continuously for the two immediately preceding years.

Bidder understands if the Secretary of Revenue determines that a Bidder receiving preference has failed to continue to meet the requirements for such preference, the Secretary may order the Director of Purchasing to: (a) reject the bid; or (b) assess a penalty against such Bidder in an amount not to exceed 5% of the bid amount and that such penalty will be paid to the contracting agency or deducted from any unpaid balance on the contract or purchase order.

By submission of this certificate, Bidder agrees to disclose any reasonably requested information to the Purchasing Division and authorizes the Department of Revenue to disclose to the Director of Purchasing appropriate information verifying that Bidder has paid the required business taxes, provided that such information does not contain the amounts of taxes paid nor any other information deemed by the Tax Commissioner to be confidential.

Under penalty of law for false swearing (*West Virginia Code*, §61-5-3), Bidder hereby certifies that this certificate is true and accurate in all respects; and that if a contract is issued to Bidder and if anything contained within this certificate changes during the term of the contract, Bidder will notify the Purchasing Division in writing immediately.

Bidder: Shimadzu Scientific Instruments      Signed: Jackie Puscano  
 Date: 5-19-2009      Title: Sales Administrator

\*Check any combination of preference consideration(s) indicated above, which you are entitled to receive.

STATE OF WEST VIRGINIA  
Purchasing Division**PURCHASING AFFIDAVIT****VENDOR OWING A DEBT TO THE STATE:**

*West Virginia Code* §5A-3-10a provides that: No contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and the debt owed is an amount greater than one thousand dollars in the aggregate.

**PUBLIC IMPROVEMENT CONTRACTS & DRUG-FREE WORKPLACE ACT:**

If this is a solicitation for a public improvement construction contract, the vendor, by its signature below, affirms that it has a written plan for a drug-free workplace policy in compliance with Article 1D, Chapter 21 of the *West Virginia Code*. The vendor **must** make said affirmation with its bid submission. Further, public improvement construction contract may not be awarded to a vendor who does not have a written plan for a drug-free workplace policy in compliance with Article 1D, Chapter 21 of the *West Virginia Code* and who has not submitted that plan to the appropriate contracting authority in timely fashion. For a vendor who is a subcontractor, compliance with Section 5, Article 1D, Chapter 21 of the *West Virginia Code* may take place before their work on the public improvement is begun.

**ANTITRUST:**

In submitting a bid to any agency for the state of West Virginia, the bidder offers and agrees that if the bid is accepted the bidder will convey, sell, assign or transfer to the state of West Virginia all rights, title and interest in and to all causes of action it may now or hereafter acquire under the antitrust laws of the United States and the state of West Virginia for price fixing and/or unreasonable restraints of trade relating to the particular commodities or services purchased or acquired by the state of West Virginia. Such assignment shall be made and become effective at the time the purchasing agency tenders the initial payment to the bidder.

I certify that this bid is made without prior understanding, agreement, or connection with any corporation, firm, limited liability company, partnership or person or entity submitting a bid for the same materials, supplies, equipment or services and is in all respects fair and without collusion or fraud. I further certify that I am authorized to sign the certification on behalf of the bidder or this bid.

**LICENSING:**

Vendors must be licensed and in good standing in accordance with any and all state and local laws and requirements by any state or local agency of West Virginia, including, but not limited to, the West Virginia Secretary of State's Office, the West Virginia Tax Department, West Virginia Insurance Commission, or any other state agencies or political subdivision. Furthermore, the vendor must provide all necessary releases to obtain information to enable the Director or spending unit to verify that the vendor is licensed and in good standing with the above entities.

**CONFIDENTIALITY:**

The vendor agrees that he or she will not disclose to anyone, directly or indirectly, any such personally identifiable information or other confidential information gained from the agency, unless the individual who is the subject of the information consents to the disclosure in writing or the disclosure is made pursuant to the agency's policies, procedures and rules. Vendor further agrees to comply with the Confidentiality Policies and Information Security Accountability Requirements, set forth in <http://www.state.wv.us/admin/purchase/privacy/noticeConfidentiality.pdf>.

Under penalty of law for false swearing (*West Virginia Code* §61-5-3), it is hereby certified that the vendor affirms and acknowledges the information in this affidavit and is in compliance with the requirements as stated.

Vendor's Name: Shimadzu Scientific Instruments Inc

Authorized Signature: Jackie Muscove Date: 5-19-2009



# SHIMADZU

## QUOTATION

Number: SSI-05958-XZX5 Rev. 2

### QUOTE DESCRIPTION:

GC Dual ECD. Two copies of each manual will be provided at no charge.

Deo Picart  
WV Department of Agriculture  
Regulatory Protection Division  
State Capitol, 1900 Kanawha Boulevard East  
Charleston, WV 25305-0177  
**Phone:** 304-558-2208  
**Fax:** 304-558-3594  
**E-mail:** dpicart@ag.state.wv.us

|                        |           |                           |             |
|------------------------|-----------|---------------------------|-------------|
| <b>Effective Date</b>  | 5/19/2009 | <b>Proposed Ship Date</b> | 30 Days/ARO |
| <b>Expiration Date</b> | 6/18/2009 | <b>FOB</b>                | DESTINATION |
| <b>Ship Method</b>     | BEST WAY  | <b>Shipping Terms</b>     | PREPAID     |
| <b>Inco Terms</b>      |           |                           |             |

**PLEASE SEE ATTACHED TERMS AND CONDITIONS**

**For questions or modifications about this quote, please contact your sales representative. If you are a tax exempt customer, please contact Customer Service and send a copy of your exemption certificate in with your order. The exemption certificate can also be faxed to 410-381-1222**

**Salesperson:** Heather Juzwa MAT Regional Office  
**Phone:** (800) 388-6996 Ext. 1673 7102 Riverwood Drive  
**E-mail:** hljuzwa@SHIMADZU.com Columbia, MD 21046-2502

### ADDITIONAL INFORMATION:

The discounted price for all MAS items includes a 0.75% Industrial Funding Fee as required by GSA. Line Items 1 and 4 and 6 through 8 are included in the GSA MAS for contract GS-24F-0031M, Contractor Modification #6, which expires March 31, 2012.

## **THANK YOU FOR YOUR INTEREST IN SHIMADZU SCIENTIFIC INSTRUMENTS**

### Authorization Signature

**Date: 5/20/2009**

### For Order Placement:

Reference Quotation Number on Purchase Order  
Shimadzu Scientific Instruments  
7102 Riverwood Drive  
Columbia MD 21046  
**Toll Free:** 800-477-1227  
**Phone:** 410-381-1227  
**Fax:** 410-381-6781  
**E-mail:** [customer.service@shimadzu.com](mailto:customer.service@shimadzu.com)  
**Int'l Fax:** 410-309-6130  
**Int'l Email:** [icsc@shimadzu.com](mailto:icsc@shimadzu.com)





# QUOTATION

Number: SSI-05958-XZX5 Rev. 2

| Line #  | Product Number | Product Name                         | Qty | List Price  | Ext'd Price |
|---|----------------|--------------------------------------|-----|-------------|-------------|
| 1   | 220-90884-00   | GC-2010 AFC SPL/ECD2010 APCNO DS     | 1   | \$20,097.82 | \$20,097.82 |
| <p>GC-2010 AFC SPL-2010 ECD-2010</p> <p>The GC-2010 is a state-of-the-art Gas Chromatograph giving unsurpassed performance and reliability. This GC includes one Split/Splitless injection port with digital Advanced Flow Control module and one low volume capillary ECD. The AFC (Advanced Flow Control) module provides control of all parameters related to the injection port set points. It operates in a number of modes including Constant Linear Velocity and is capable of high pressure splitless injections. The GC oven is capable of 20 temperature program ramps and hold steps. Column Oven Cooling Time: 300°C to 50°C &lt; 6 minutes, Temp. Column oven Programming Rate: 70°C/min; Constant Linear Velocity, Pressure and flow program ramps with flow Control Range: 0 to 1200ml/min, Programming Rate: -400 to 400 ml/min.</p> <p>Column Oven Cooling Time: 300°C to 50°C &lt; 5 minutes, Temp. Column oven Programming Rate: 70°C/min; Constant Linear Velocity, Pressure and flow program ramps with flow Control Range: 0 to 1200ml/min, Programming Rate: -400 to 400 ml/min., AFC with atmospheric compensation</p> <p>Includes GC-2010 with ECD-2010. Data Station is not included.</p> |                |                                      |     |             |             |
| 2   | 221-72315-38   | AOC-20I, WITH POWER SUPPLY, GC-2010  | 1   | \$4,305.00  | \$3,449.18  |
| <p>AOC-20I Autoinjector with mounting kit for GC-2010</p> <p>Automatic liquid injector, AOC-20I provides for "Ideal Sample" injection of liquid samples. This model is capable of numerous injection techniques to include: solvent flush (multiple solvents), hot needle and traditional fast injection. It will accommodate three syringes: 10ul, 50 ul and 250 ul for introduction of small to large injection volumes. Either 1.8ml or 4ml sample vials may be used. Holds up to four rinse and 4 waste solvent containers. Auto-sensing power supply for either 110V or 220V application. Includes 10ul syringe, six sample vial rack and mounting hardware for the GC-2010.</p>   |                |                                      |     |             |             |
| 3   | 221-72300-31   | AOC-20S, GC-17/GC-2010/GC-2014,      | 1   | \$2,769.00  | \$2,218.41  |
| <p>AOC-20s Carousel</p> <p>Robotic sample tray for the AOC-20I. Holds and delivers up to 150 1.5µL vials or 96 4ml vials to the AOC-20I. It is operated through the AOC-20I keyboard, Class-VP, GCsolutions or GCMsolution software packages. This model uses a 110V or 220V variable power supply.</p> <p>Control parameters include injection speed, port dwell time and mode including traditional and solvent flush.</p> <p>Includes: Mounting kit included for GC-2010. Replaces P/N 221-44880-39 due to color change.</p>   |                |                                      |     |             |             |
| 4   | 220-94600-00   | GC SOLUTIONS SOFTWARE W/ RS232 CABLE | 1   | \$3,249.10  | \$3,249.10  |
| <p>GCsolution Software with RS232 Cable</p> <p>This software controls all Shimadzu GC systems. GC-2010, GC-17, GC-14 are all supported with all AFC, APC and detectors controlled as appropriate. Included are Shimadzu accessories and automatic sampling equipment. Capabilities for user administration and compliant data security, batch or single run acquisition and calibration, data review and correction, data comparison and full graphical reporting are in the standard package. This software handles up to four GC's with up to four detectors each. This software requires use of the Windows 2000 or XP operating system. When additional accessory control or additional processing capabilities are needed these units when added become an integral part of GCsolution</p> <p>Includes GCsolution. Software only, data station not included.</p>   |                |                                      |     |             |             |
| 5   | 220-99994-G1   | Rtx-CLPesticides                     | 1   | \$1,620.00  | \$1,620.00  |
| <p>Rtx-CLPesticides, 30-Meter, -60 to 320/340°C, 0.32µm df, 11141, Rtx-CLPesticides2, 30-Meter, -60 to 320/340°C, 0.25µm df, 11324, Universal Angled "Y" Press-Tight Connector, 20403</p>   |                |                                      |     |             |             |
| 6   | 220-90999-00   | ECD-2010 ASSY KT                     | 1   | \$7,248.64  | \$7,248.64  |



# SHIMADZU

## QUOTATION

Number: SSI-05958-XZX5 Rev. 2

| Line #  | Product Number | Product Name  | Qty | List Price | Ext'd Price |
|---|----------------|---|-----|------------|-------------|
| ECD 2010 with APC and General License   |                |   |     |            |             |
| This kit contains the foiled ECD-2010, the electrometer, the APC module with cables and the tubing to connect it to the GC-2010. It also contains General License documentation   |                |   |     |            |             |
| 7   | 220-97318-00   | STANDARD WORKSTATION PC (DELL)  | 1   | \$1,514.34 | \$1,514.34  |
| Standard Workstation PC - Dell Precision (E8200 Processor)  |                |   |     |            |             |
| Dell Precision - Intel Core 2 Duo processor E8200 (2.66GHz/1333MHz/6MB L2) Mini Tower PC with Windows XP PRO SP2 with Windows Vista License. The system has an Intel® Core 2 Duo processor, 2048MB Dual Channel DDR2 667MHz SDRAM, 160GB SATA hard drive, 48X/32X/48X CD-RW/DVD Combo Drive, Memory is expandable to 8GB DDR2 667 SDRAM, 1.44 MB 3.5" floppy drive, USB keyboard, Optical Wheel mouse, 256MB nVidia Graphics Card, Intel Integrated Gigabit 10/100/1000 network connection, Two PCI slots, two x16 PCI Express Slots, One PCI-Express x1, one Serial Port, One Parallel Port, 11 USB 2.0 (2 front, 6 back and 3 Internal), Integrated High Definition Audio (no speakers). Warranty includes up to 3 years limited Warranty with up to 3 years standard next business day (NBD) onsite parts replacement and up to 3 years NBD onsite labor through Dell Inc. |                |   |     |            |             |
| 8   | 220-97319-00   | DELL E1909 19" FLAT PANEL LCD   | 1   | \$222.94   | \$222.94    |
| Dell 1909W 19" Flat Panel LCD   |                |   |     |            |             |
| Panel Size: 19", Panel Type: TN - Twisted Nematic, Maximum Resolution: 1440 X 900, Contrast Ratio: 1000:1(typical), Brightness: 300 cd/m2 (typical), Response Time: 5 ms (typical), Viewing Angle: 160° / 160° (typical), Color Support: 16.7 million colors, Pixel Pitch: 0.285 mm. Up to 3 YRS Limited Warranty and advanced Portable Exchange through Dell Inc.  |                |   |     |            |             |
| 9   | 1YW            | 1 YEAR WARRANTY   | 1   | \$0.00     | \$0.00      |
| 10  | I&F            | INSTALLATION AND CUSTOMER FAMILIARIZATION                                     | 1   | \$0.00     | \$0.00      |
| 11  | BALANCE_OFFER  | YOU MAY ADD A SHIMADZU BALANCE TO THIS ORDER AT 50% DISCOUNT. ASK FOR DETAILS | 1   | \$0.00     | \$0.00      |

|                                  |             |
|----------------------------------|-------------|
| <b>Total List Price</b>          | \$41,026.84 |
| <b>Total Line Item Discounts</b> | \$1,406.41  |
| <b>Subtotal</b>                  | \$39,620.43 |
| <b>Total Amount</b>              | \$39,620.43 |

### Options

| Line # | Product Number | Product Name               | Qty | List Price | Net Price   |
|--------|----------------|----------------------------|-----|------------|-------------|
|        | 220-99999-Y1   | TOTAL COVERAGE Plan for GC | 4   | \$3,844.00 | \$13,838.40 |



# QUOTATION

Number: SSI-05958-XZX5 Rev. 2

| Options |                |  | Qty | List Price | Net Price |
|---------|----------------|--|-----|------------|-----------|
| Line #  | Product Number | Product Name   |     |            |           |
|         |                | The benefits in placing your instrumentation under the TOTAL COVERAGE maintenance plan are:  |     |            |           |
|         |                | <ul style="list-style-type: none"><li>• (1) Guaranteed scheduled maintenance visit per year</li><li>• Productivity is increased through routine scheduled instrument maintenance</li><li>• ALL electrical , mechanical and electromechanical parts are covered*</li><li>• Unlimited FREE technical telephone support</li><li>• (1) P.O. number for 12 months coverage</li><li>• No additional travel or labor charges for emergency repairs*</li></ul> |     |            |           |



# SHIMADZU

## QUOTATION

Number: SSI-05958-XZX5 Rev. 2

### Terms and Conditions

#### GENERAL TERMS AND CONDITIONS OF SALE

Shimadzu Scientific Instruments, Inc.

#### PRICES

The prices set forth on the face hereof

- (i) are Shimadzu Scientific Instruments, Inc.'s (hereinafter called SSI) domestic prices based upon manufacture of the quality and type ordered for shipment and end use within the United States and Canada only, all products shipped for end use outside the United States and Canada shall be subject to SSI's international prices,
- (ii) are subject to revision when interruption, engineering changes or changes in quantity or quality are caused or requested by Buyer, and
- (iii) unless otherwise specified, does not include warranty service or installation outside the United States and Canada. Clerical errors by Shimadzu are subject to correction.

#### SPECIFICATIONS

Weights and dimensions set forth in sales literature are not guaranteed unless previously certified in writing. SSI may, without affecting the obligations under this sales agreement, make what SSI regards as minor changes to the specifications of the product or products delivered under this sales agreement from those contained in sales literature.

#### TERMS OF PAYMENT

Subject to the credit approval by SSI, terms of payment on this sales agreement are net thirty (30) days from date of the invoice unless otherwise specifically stated on the face hereof. Invoices are payable at par on date due at any place of collection designated by SSI in funds bankable at par. Payment made beyond terms will be subject to simple interest of 1-1/2% per month on the outstanding balance. All orders are accepted subject to and the obligation of SSI to make deliveries is subject to the right of SSI to require of Buyer payment of all or any part of the purchase price in advance of delivery or to make shipment C.O.D. If Buyer fails to make advance payment when requested to do so by SSI or if Buyer is or becomes delinquent in the payment of any sum of any kind due SSI (whether or not arising out of this sales agreement) or refuses to accept C.O.D. shipments, then SSI shall have the right, in addition to any other remedy to which it may be entitled in law or in equity, to cancel this sales agreement, refuse to make further deliveries, and declare immediately due and payable all unpaid amounts of goods and services previously delivered to Buyer. Each shipment shall be considered a separate and independent transaction and payment therefore shall be made accordingly.

"Buyer must notify SSI within fifteen (15) days from the invoice date if Buyer has not received products."

#### SHIPMENTS

(a) The cost of packaging for domestic shipments is included in the quoted price. For international shipments or where special packaging is specified or necessary, a charge will be made to cover such expense.

(b) For shipments to and from places within the United States, all shipments-unless otherwise agreed in writing— shall be FOB point of shipment and title and risk of loss or damage shall be passed to Buyer at the shipping point. The cost of transportation and insurance (if requested by Buyer) shall be borne by Buyer.

(c) For shipments from the United States to ports and or places outside the United States all shipments are--unless otherwise agreed in writing--FOB Columbia, MD. SSI's obligation to affect shipment of the products purchased by Buyer shall be fully discharged, and beneficial ownership, legal title and all risk of loss or damage shall pass to Buyer when the products are shipped to the named place of destination in the country of importation. If shipped FOB Destination, upon arrival Buyer shall be entitled to conduct a reasonable investigation of the products purchased by it, but all claims for losses due to loss or damage to products while in transit shall be waived unless made immediately in writing by Buyer, but not more than (30) thirty days after arrival. If Buyer shall fail or refuse to accept delivery of any of the products for unverifiable claims for loss or damage to products occurring while in transit, all sums paid on deposit shall be retained by SSI as liquidated damages, provided, however, that SSI may recover in full its actual damage from Buyer in the event that actual damages exceed the amount retained as liquidated damages.

(d) All claims for damage or loss of insured shipments shall be immediately communicated, when possible, to SSI at (410) 381-1227, 7102 Riverwood Drive, Columbia, Maryland 21046-2502, Attn: Customer Service. Buyer shall immediately notify delivering carrier of loss or damage to the shipment and SSI will cooperate with Buyer in the adjustment of all claims. Buyer agrees to permit SSI or SSI's representative to inspect damaged goods.

#### TERMINATION

Upon any termination or cancellation of this sales agreement by Buyer, either in whole or in part, Buyer agrees to promptly pay appropriate termination or cancellation charges invoiced by SSI. If appropriate, the termination charge shall be not less than twenty percent (20%) of the total amount of this sales agreement.

#### RETURNED GOODS

All returns must be pre-authorized by SSI and a Return Goods Authorization (RGA) number must appear on the face of the package. Returned goods will be subject to a restocking charge. If appropriate, the restocking charge shall be not less than twenty percent (20%) of the total amount of this sales agreement.

#### DELIVERY

The scheduled shipping or delivery date shown on the face hereof is our best estimate of the time the order will be shipped and SSI assumes no liability for loss, general damages, or special or consequential damages due to delays.

#### TAXES

Federal, state and local excise, sales, or use taxes shall be paid by Buyer.

#### PATENTS

SSI shall defend any suit or proceeding brought against the Buyer so far as based upon an assertion that any product furnished under this sales agreement constitutes a direct infringement of any United States patent having a claim of claims covering solely the product itself, if notified promptly in writing and given authority, information and assistance (at SSI's expense) for the defense of same, and SSI shall pay all damages and costs awarded therein against Buyer. In case said product in such suit is held to constitute infringement and the use of said product in enjoined, SSI shall, at its own option and at its own expense, either (1) procure for Buyer the right to continue using said

product, (2) replace the same with a non-infringing product, (3) modify it so it becomes non-infringing, or (4) remove said product and refund the purchase price and transportation costs thereof. The foregoing obligations of SSI shall not apply to any infringement claim based upon (i) any use of any product sold hereunder in any process or in conjunction with any other product, or (ii) any product manufactured to Buyer's design or any product having a design arising out of compliance with Buyer's specifications. The foregoing states the entire liability of SSI for patent infringement by said product. If any suit or proceeding is brought against SSI based on claims that the goods manufactured by SSI in compliance with Buyer's specifications and supplied to Buyer directly infringe any fully issued United States patent, then the patent indemnity obligations herein stated with respect to SSI shall reciprocally apply with respect to Buyer.

#### WARRANTY

Subject to the exceptions and upon the conditions stated below, SSI warrants that the products sold under this sales agreement shall be free from defects in workmanship and materials for one year after shipment of the products to the original Buyer by SSI, and if any such products should prove to be defective within such one year period, SSI agrees, at its option, either (i) to correct by repair or, at SSI election, by replacement with equivalent product any such defective product, provided that investigation and factory inspection discloses that such defect developed under normal and proper use, or (ii) to refund the purchase price. The exceptions and conditions mentioned above are as follows:

- (a) Components or accessories manufactured by SSI which by their nature are not intended to and will not function for one year are warranted only to give reasonable service for a reasonable time; what constitutes reasonable time and reasonable service shall be determined solely by SSI. A complete list of such components and accessories is maintained at the factory;
- (b) SSI makes to warranty with respect to components or accessories not manufactured by it, in the event of defect in any such component or accessory SSI will give reasonable assistance to Buyer in obtaining from the respective manufacturer whatever adjustment is authorized by the manufacturer's own warranty;
- (c) any product claimed to be defective must, if required by SSI, be returned to the factory, transportation charges prepaid, and will be returned to Buyer with transportation charges collect unless the product is found to be defective, in which case SSI will pay all transportation charges;
- (d) If the product is a reagent or the like, it is warranted only to conform to the quantity and content and for the period (but not in excess of one year) stated on the label at the time of delivery;
- (e) SSI may from time to time produce a special printed warranty with respect to a certain product, and where applicable, such warranty shall be deemed incorporated herein by reference;
- (f) SSI shall be released from all obligations under all warranties, either expressed or implied, if any product covered hereby is repaired or modified by persons other than its own authorized service personnel unless such repair by others is made with the written consent of SSI. IT IS EXPRESSLY AGREED THAT THE ABOVE WARRANTY SHALL BE IN LIEU OF ALL WARRANTIES OF FITNESS AND OF THE WARRANTY OF MERCHANTABILITY AND THAT SSI SHALL HAVE NO LIABILITY FOR SPECIAL OR CONSEQUENTIAL DAMAGES OF ANY KIND OR FROM ANY CAUSE WHATSOEVER, INCLUDING BUT NOT LIMITED TO LOSS OF USE, LOSS OF DATA, LOSS OF PRODUCTIVITY, LOSS OF BUSINESS, LOSS OF PROFIT, LOSS OF PLANT, EQUIPMENT OR PRODUCTION, EVEN IF SSI HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, ARISING OUT OF THE MANUFACTURE, USE, SALE, HANDLING, REPAIR, MAINTENANCE OR REPLACEMENT OF ANY OF THE PRODUCTS SOLD UNDER THIS SALES AGREEMENT.

If an SSI Special Warranty (covering a designated item or items) is contained in the manual or is otherwise shipped with such designated item or items, the terms and conditions specified therein are incorporated herein by reference and shall supplement this warranty. In the event of a conflict between the terms and/or conditions specified herein and those specified in such Special Warranty, the terms and/or conditions of the Special Warranty shall control. Representations and warranties made by any person, including dealers and representatives of SSI, which are inconsistent or in conflict with the terms of this warranty, shall not be binding upon SSI unless reduced to writing and approved by an expressly authorized officer of SSI.

#### U.S. GOVERNMENT CONTRACTS

If the products to be furnished under this sales agreement are to be used in the performance of a U.S. Government contract or subcontract and a U.S. Government contract number shall appear on Buyer's order, those clauses of the applicable U.S. Government procurement regulation which are mandated by Federal Statute to be included in U.S. Government subcontracts shall be incorporated herein by reference including, without limitation, the Fair Labor Standards Act of 1938, as amended.

#### FDA REQUIREMENTS

If any product listed on the face of this sales agreement is subject to regulations of FDA as a device, then as to said product only, sale and delivery is contingent upon successful completion and processing of a 510(k) notice for such product.

#### APPLICABLE LAW; JURISDICTION VENUE

This sales agreement is made and entered into and shall be governed, enforced and interpreted in accordance with the laws of the State of Maryland, and Customer hereby expressly consents to jurisdiction of the courts of the State of MD on all matters relating hereto. In the event that either party commences litigation to enforce any provision hereof, said litigation shall be brought in the courts of Howard County, Maryland, and the prevailing party shall be entitled to an award to all costs and reasonable attorney's fees actually incurred.

This document contains the number of pages indicated, including all attachments. Authorized signature required on quotation pages

SSI-05958-XZX5 Rev. 2

**Authorization Signature**



**Date: 5/20/2009**





Mr. Ron Price  
Department of Agriculture  
Buildings and Grounds Division  
Building 17  
4720 Brenda Lane  
Charleston, WV 25312  
Re: AGR0926

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Dear Mr. Price,

I am writing in regards to your request for quotation AGR0926 for a Gas Chromatograph.

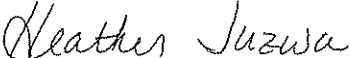
Shimadzu Scientific Instruments (SSI) is the American subsidiary of Shimadzu Corporation, headquartered in Kyoto, Japan. Founded in 1875, Shimadzu is a \$2 billion multinational corporation with three major divisions: Medical Diagnostics, Aerospace/Industrial and Analytical Instruments. The Analytical Division is one of the world's largest manufacturers of analytical instrumentation and environmental monitoring equipment.

In 1975, SSI corporate headquarters was established in Columbia, Maryland to provide analytical solutions to a wide range of laboratories in North, Central and parts of South America. In the U.S., SSI has a network of more than 50 locations providing local and regional sales, service and technical support.

We take no exceptions to the bid.

Thanks again for the opportunity to earn your business.

Sincerely,

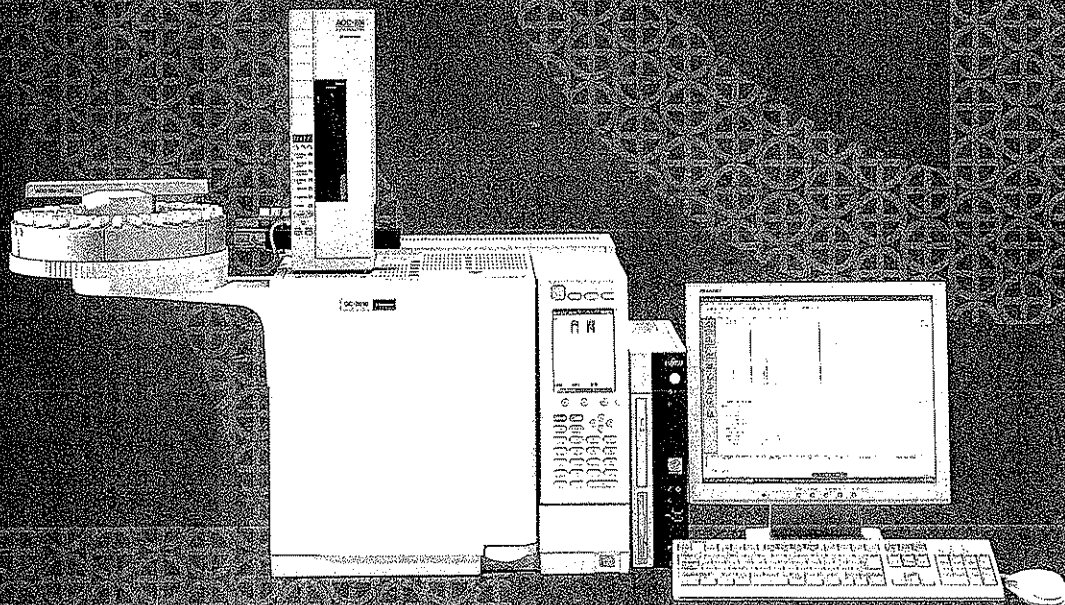
  
Heather Juzwa  
Field Sales Engineer

**Building Strong Customer Bonds**

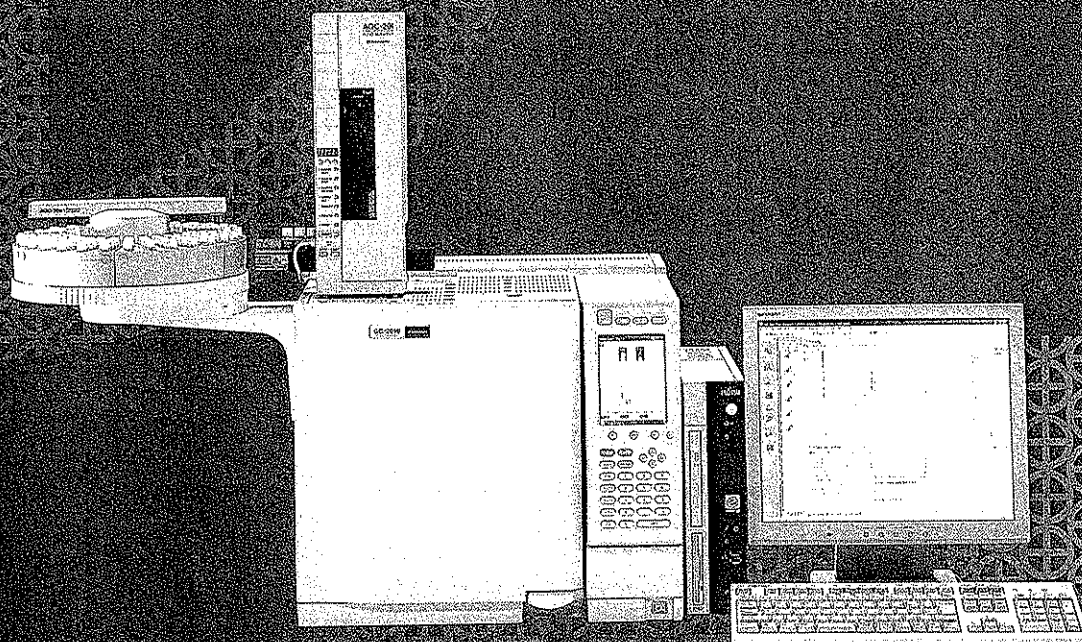


# GC-2010 GCsolution Ver.2

Shimadzu  
Capillary  
Gas Chromatograph System







The future for better GC separation,  
faster analysis, and reduced downtime  
GC-2010 / GCsolution Ver.2



# GC-2010 GCsolution Ver.2

CAPILLARY  
GAS CHROMATOGRAPH SYSTEM

Innovation, Performance, Friendly



## High Performance

Sensitive, high-speed analysis with excellent repeatability



## Easy Operation

Self-diagnostic functions and easy-to-see large display

Carrier gas constant linear velocity mode



## Flexibility

Simultaneous analysis system with 3 detectors

Dual injection system



## Application Systems

Pretreatment units (headspace gas analysis, pyrolysis)

Distillation GC, PONA-GC



## Data Management

GCsolution Ver. 2 workstation

Simple operation and comprehensive basic functions enhance analysis productivity

GLP/GMP compliant, network-compatible

## Contents

P 04 - High Performance

P 11 - Data Management

P 15 - Network-compatibility

P 06 - Easy Operation

P 12 - User Interface

P 16 - Application Systems

P 08 - Flexibility

P 13 - Data Analysis/  
Report Generation

P 17 - Specifications

P 14 - GLP/GMP-Functions

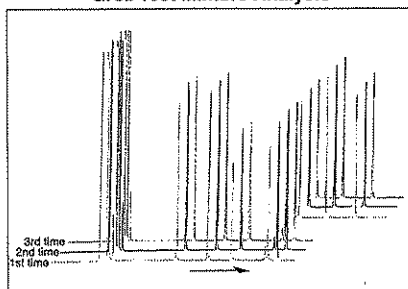
P 18 - GCMS-QP2010 Plus

# Superb Basic Functions Promise Fas

## Ultimate Repeatability

A new-generation AFC (Advanced Flow Controller) features rapid response and temperature correction functions, plus an improved sample injection unit and column oven all work together to achieve excellent repeatability for retention time, peak area, and peak height.

Grob Test Mixture Analysis



Peak Area Repeatability (100 ppm Grob Test Mixture)

|                    | 1       | 2       | 3       | 4       | 5       | 6       | 7       | 8       |
|--------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| 76579              | 60390   | 76285   | 68766   | 53094   | 54525   | 68680   | 57910   |         |
| 76843              | 60666   | 76546   | 69022   | 53314   | 54785   | 69058   | 57584   |         |
| 76975              | 60775   | 76693   | 69148   | 53331   | 54803   | 68954   | 57576   |         |
| 76873              | 60673   | 76505   | 69003   | 53244   | 54678   | 68870   | 57487   |         |
| 76294              | 60249   | 76053   | 68502   | 52872   | 54351   | 68625   | 57169   |         |
| 76396              | 60362   | 76178   | 68639   | 53010   | 54516   | 68849   | 57368   |         |
| 76216              | 60177   | 76037   | 68466   | 52850   | 54382   | 68651   | 57170   |         |
| 76362              | 60338   | 76150   | 68590   | 52941   | 54444   | 68735   | 57274   |         |
| 76371              | 60346   | 76113   | 68635   | 52976   | 54432   | 68733   | 57318   |         |
| 76725              | 60552   | 76401   | 68930   | 53225   | 54675   | 68936   | 57523   |         |
| Mean               | 76394.0 | 60337.3 | 76155.3 | 68627.0 | 52979.0 | 54466.7 | 68754.8 | 57303.7 |
| Standard deviation | 174.815 | 126.709 | 132.031 | 164.275 | 134.922 | 116.704 | 118.488 | 133.666 |
| CV%                | 0.229   | 0.210   | 0.173   | 0.239   | 0.255   | 0.214   | 0.172   | 0.233   |

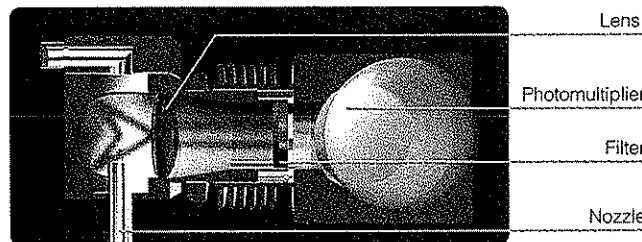
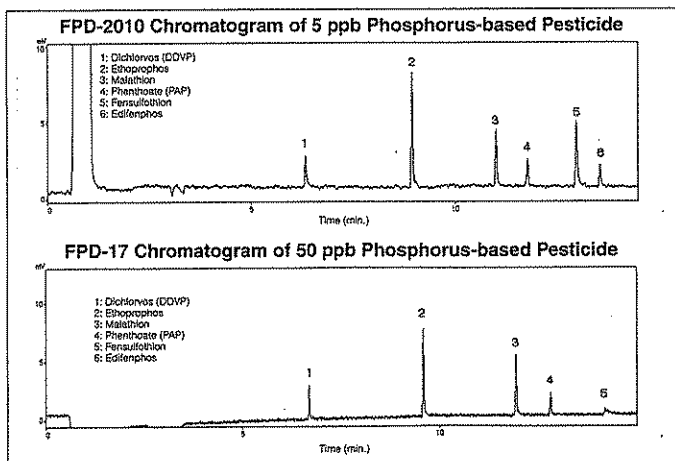
## Even Higher Sensitivity

All detectors have been re-designed for greater compactness and higher sensitivity. The upgraded optics of the FPD (Flame Photometric Detector) employs a condenser lens and total reflection system using mirrors to offer world-beating sensitivity. The nozzle construction prevents adhesion and decomposition of the sample. (Sensitivity is increased five times compared to GC-17A.)

### World-beating Sensitivity

**FPD**  
Flame Photometric Detector  
Using total reflection system and condenser lens

Sensitivity is Up **fivefold!!**  
(In comparison with Shimadzu GC-17A)



FPD-2010 Flame Photometric Detector

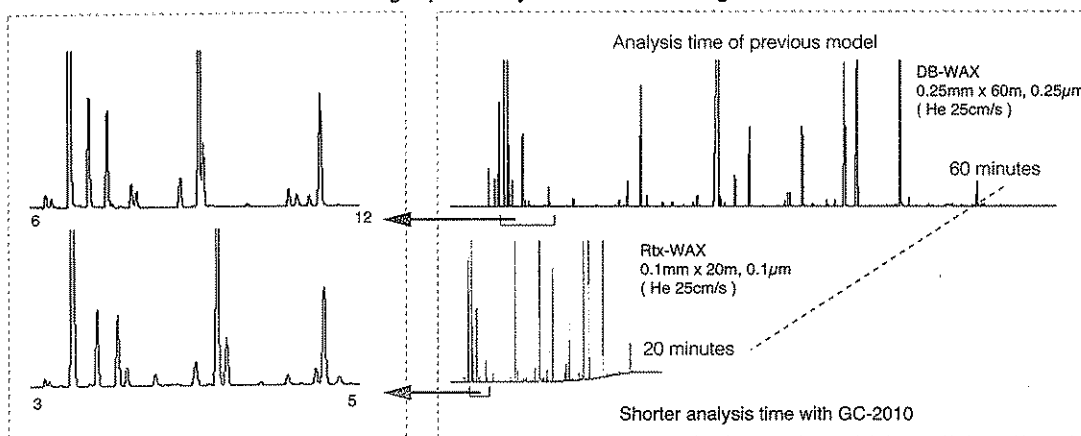
Column: DB1 30 m x 0.25 mm ID;  $d_f = 0.25 \mu\text{m}$   
 Column temperature: 60°C(1min) → 20°C/min → 200°C → 10°C/min → 270°C  
 Injection unit temperature: 260°C  
 Detector temperature: 280°C  
 Carrier gas: He  
 Carrier gas linear velocity: 40 cm/s (constant linear velocity mode)  
 Detector H<sub>2</sub> flowrate: 80 mL/min.  
 Detector air flowrate: 120 mL/min.  
 Sample injection volume: 2  $\mu\text{L}$  (high-pressure splitless analysis)

# and Accurate Analysis Results

## Greater Speed

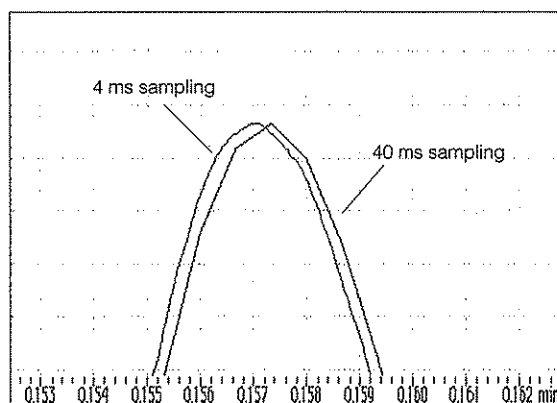
High-speed analysis with a narrow-bore capillary column reduces operator time and increases sample-throughput. But it places stringent demands on inlet design and carrier gas pneumatics (through high column back pressures and high split flow rates). The new-generation AFC digital flow controller supports high-speed analysis at a maximum pressure of 970 kPa and 1200 mL/minute maximum flow rate.

### High-speed Analysis of Coffee Flavoring



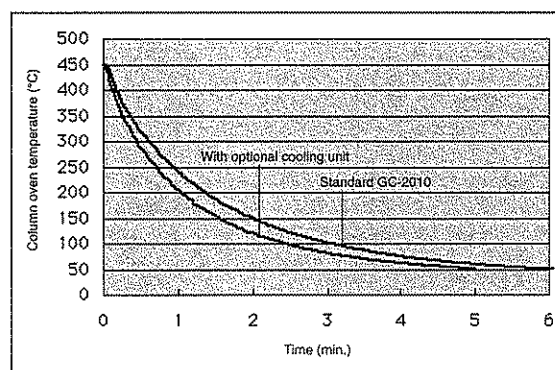
### Workstation Engineered for High-speed Analysis

The rapid 250 Hz (4 ms) detector data sampling rate of the GCsolution GC workstation ensures sharp, accurate peaks for narrow-bore-column analysis.



### Rapid Column Oven Heating and Cooling

The high-power oven achieves rapid heating. The column-oven cooling rate is an important factor when conducting consecutive programmed-temperature gas chromatography analyses. The GC-2010 allows cooling from 450°C to 50°C in about 6 minutes. Adding the optional high-speed cooling unit makes cooling even quicker.



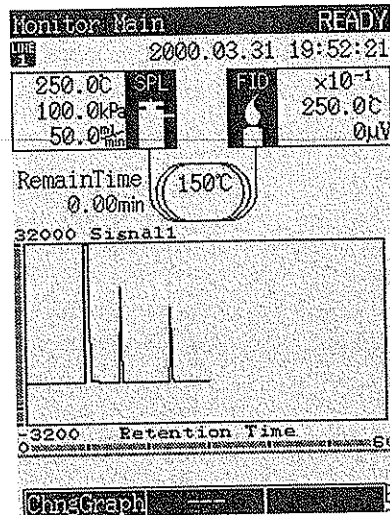
# Easy Operation Saves Time and Total

## Large Display

An information rich, large display is provided to show a lot of information. The text and graphic screen lets you set the analysis conditions quickly and easily. The built-in help functions make operation training almost unnecessary after the instrument is installed. Digital setting of all parameters, including temperatures and flowrates, allows accurate reproduction of the analysis conditions.

### Large Display

- Graphic user interface
- Text display
- Built-in help functions
- Chromatogram display

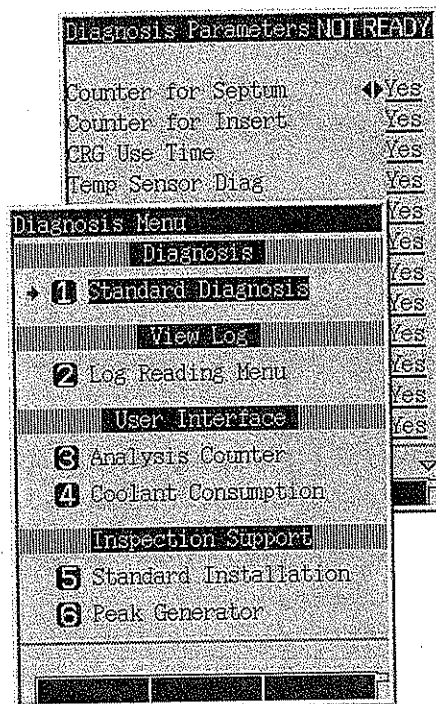


## Intelligent Self-diagnostic Functions

Extensive self-diagnostic functions check that the instrument is functioning correctly. These functions conduct a detailed diagnosis that includes the septum and glass insert operating status, temperature sensor errors, supplied gas pressure, control status for each gas, ignition operation, DC voltage, and AD converter. Regular diagnosis prevents unexpected downtime.

### Self-diagnostic Functions

- Unit control check
- Hardware diagnosis
- Save and check diagnosis log



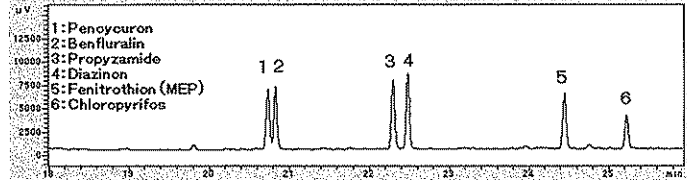
# Cost

## Constant Linear Velocity Mode Quickly Determines Separation Conditions

Shimadzu presents carrier gas control based on the carrier gas linear velocity, which bears a direct correlation to the separation performance, instead of the conventional method using column inlet pressure and column flowrate settings. The constant linear velocity mode reduces the time taken to determine the analysis conditions needed to obtain the optimal separation chromatogram.

### Comparison of chromatograms with constant linear velocity and constant column inlet pressure (Pesticides Analysis)

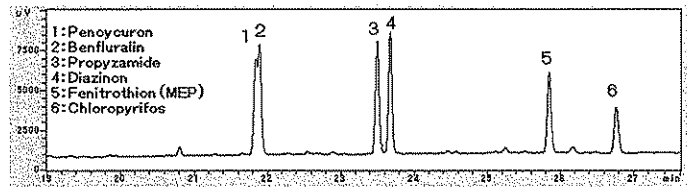
Constant linear velocity



### Constant Linear Velocity Mode

Quickly determines optimal analysis conditions  
Convenient method transfer between GCs and GC/MS

Constant column inlet pressure

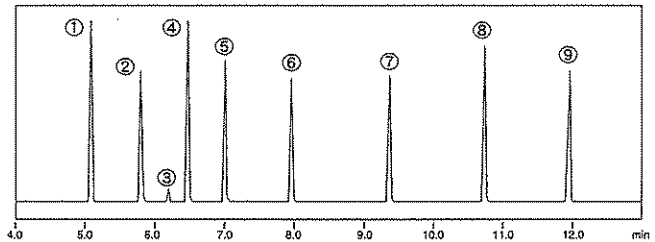


Column: DB1 30 m x 0.32 mm ID;  $d_i = 0.25 \mu\text{m}$   
Column temperature: 60°C (1min) — 7°C/min — 230°C  
Injection unit temperature: 240°C  
Detector temperature: 270°C (FID)  
Carrier gas: He  
Carrier gas linear velocity: 40 cm/s (44.0 kPa column inlet pressure)  
Sample injection volume: 1  $\mu\text{L}$  (splitless analysis)

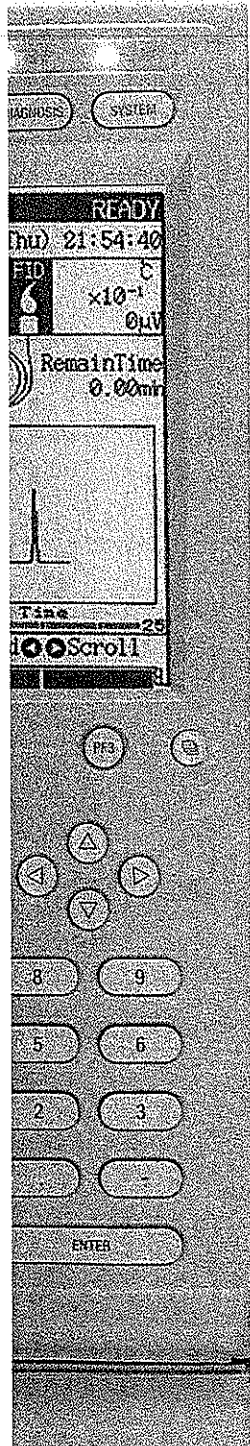
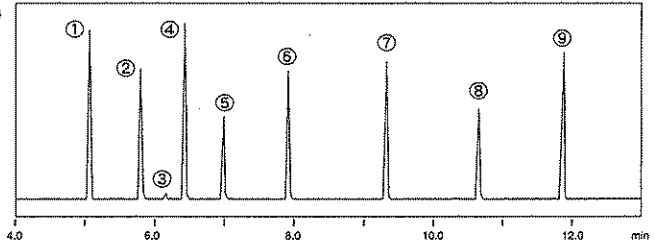
Comparison of the GC-FID chromatogram and GC/MS-QP2010 total ion chromatogram (TIC) is also simple in the carrier gas constant linear velocity mode. Using the same type of column and setting the same carrier gas linear velocity values results in a virtually identical separation profile.

### Comparison of GC-FID and GC/MS-TIC Chromatograms (Grob Test Mixture Analysis)

GC-FID



GC/MS(TIC)





# Unit Expandability Supports all

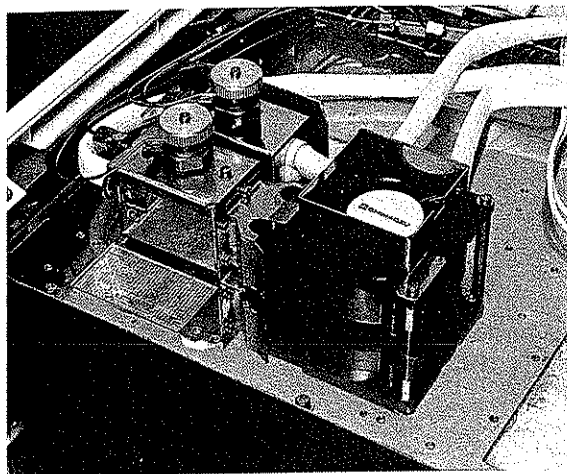
## Simultaneously Mount Up to Three Injection Units and Four Detectors\*

Select from three injection units and five detector types to suit the needs of the analysis and the target components. GCsolution allows up to four detectors to be mounted simultaneously. Options such as injection units, detectors, and auto-injectors can be easily added after installing the unit.

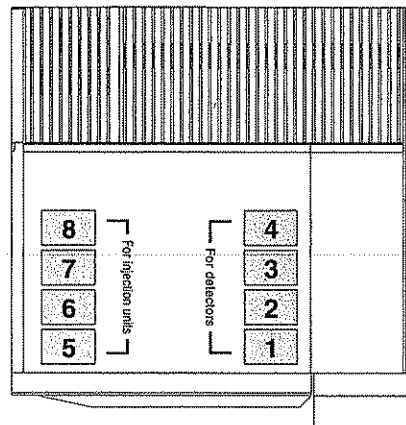
\* The quantities of units which can simultaneously mount up depends on the injector and detector type.

## Comprehensive Range of Injection Units

Obtaining superior data requires selection of the optimal sample injection method to suit the aim of the analysis and the target components. The GC-2010 can select the optimal injection mode from three types of injection unit.



Top of GC-2010



## Split / Splitless Injection Unit

### SPL-2010

- Standard unit for high-speed analysis with a narrow bore column.
- Gas saver function can restrict the amount of split gas used.
- Support high-pressure injection.

## Direct Injection Unit

### WBI-2010

- Incorporates a septum purge flowpath to restrict solvent tailing.
- Sharing glass inserts with splitless analysis simplifies use (patented).  
(Contact your Shimadzu representative about connecting a packed column.)

## On-column/Programmable Temperature Vaporizer Injection unit

### OCI/PTV-2010

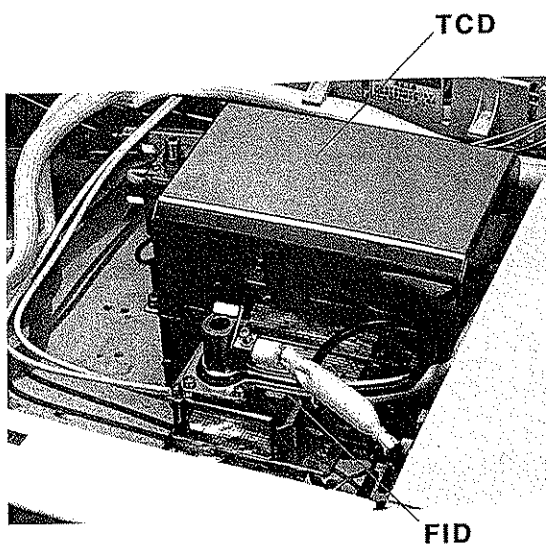
- Handles sample injection using both cold on-column and PTV methods.
- Uses inactive, heat-resistant quartz PTV inserts.
- The optional simple OCI insert permits use of a small-ID capillary column for the cold on-column method without a 0.53 mm ID. pre-column press-tight connection.
- Supports the analysis of compounds with a high boiling point (straight-chain hydrocarbons with 100 carbon number).

# Analysis Types

## Compact, Highly Sensitive Detector Range

The detectors have been re-designed to be more compact. All detectors can be installed under the instrument top cover to allow easy mounting of each option and pretreatment unit.

Each detector incorporates an APC (Advanced Pressure Controller) that permits digital setting of the detector gas flowrate.



### Thermal Conductivity Detector

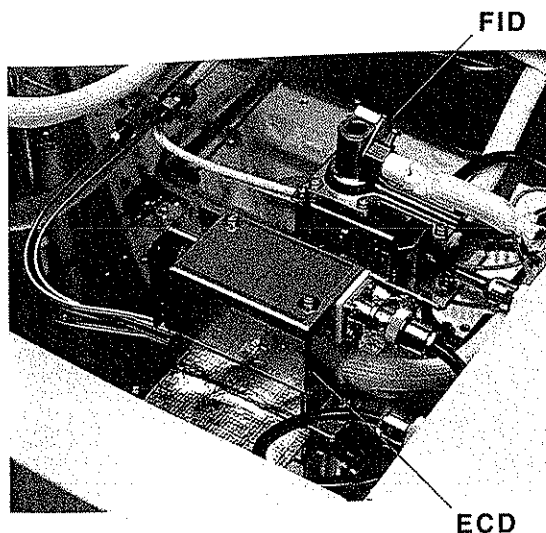
#### TCD-2010

- For the analysis of inorganic gases and concentrated organic compounds.
- Microvolume cell handles sharp peaks.
- Shorter stabilization time than previous Shimadzu instruments.

### Flame Ionization Detector

#### FID-2010

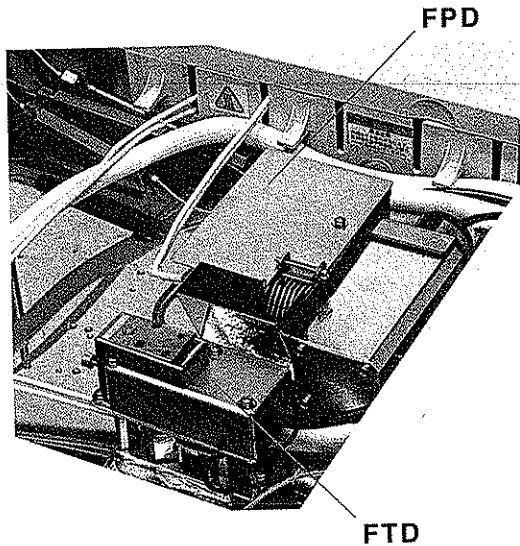
- For the general detection of organic compounds.
- Enhanced machining accuracy of the individual components restricts instrumental errors and improves sensitivity.
- Automatic ignition, extinguishing, and re-ignition functions
- Feedback function reduces gas supply pressure to zero when extinguishing the hydrogen flame.
- Optional flame monitor can be mounted.



### Electron Capture Detector

#### ECD-2010

- Upgraded cell thermal insulation and reduced contamination improve sensitivity.
- Compact design achieves shorter stabilization times.
- In some countries, registration with the Ministry of Education, Culture, Sports, Science and Technology under the Law Concerning Prevention from Radiation Hazards due to Radio-Isotopes, is required before purchasing or using this detector. (Contact your Shimadzu representative for details.)

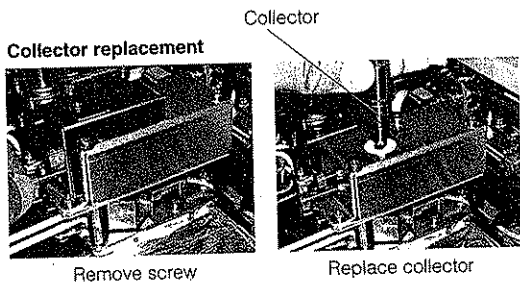


## Flame Photometric Detector

### FPD-2010

- For analysis of organic sulfur compounds and organic phosphorus compounds such as residual pesticides and malodorous components.
- Updated optics improve sensitivity 5 times, compared with previous instruments.
- Nozzle construction prevents adhesion and decomposition of the sample.
- Designed for compactness and high maximum operating temperature (350°C).
- No tools needed for filter replacement.

#### Filter replacement



## Flame Thermionic Detector (NPD)

### FTD-2010

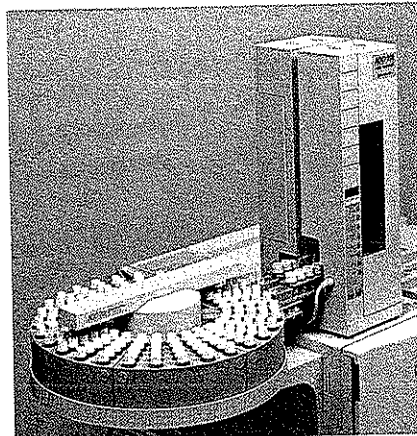
- For analysis of organic nitrogen compounds and organic phosphorus compounds such as residual pesticides.
- New collector construction allows collector replacement without tools.
- Optional alkali source regeneration kit saves running costs.



## Dual Injector System

A dual injector system can be configured with a combination of two AOC-20i and one AOC-20s unit. Two-line simultaneous injection doubles the number of samples to improve productivity.

**AOC-20i** + **AOC-20s**





# An Shimadzu Gas Chromatograph

## Features of GCsolution Ver.2

The  
top  
Eac  
gas

### Easy Operation

- Common operation and layout with other LabSolution software, such as Assistant Bar and Data Explorer, ensures an intuitive common user interface that can be easily learned. GCsolution Ver.2 realizes further simple operation.
- Manipulation function is improved and simple operation with versatile functions are realized.

### Better Analysis Productivity

- Handles control and data processing for up to four GC systems (GC-2010, GC-2014, GC-17A, or GC-14B)
- Supports simultaneous processing of two samples on a single instrument and dual injection system for the ultimate in high throughput analyses.

### Comprehensive Basic Functions

- Inherits the popular, proven and robust Chromatopac and CLASS-GC10 integration algorithm.
- Comprehensive functions for peak identification, quantitation, and data comparison.
- Flexible report generation functions with operation similar to MS-Word. Summary report output is possible.

### GLP/GMP Compliance

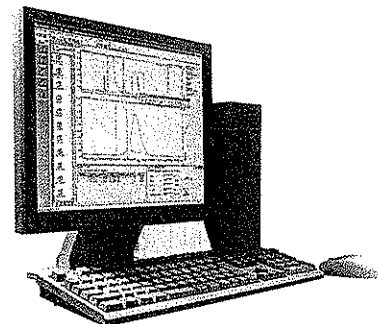
- Full support of user management functions and GC-2010 self-diagnostic functions to enhance data reliability. Supports rigorous GLP/GMP requirements, including audit-trail functions for all method parameters.
- 21 CFR Part 11 compliance support functions are equipped as standard.

### Network-compatibility

- Effective use of the network environment, such as in-office data analysis and remote access from the office is possible.
- CLASS-Agent provides file sharing and centralized data management.

### Customization of User Interface

- OLE automation capability supports to realize simpler operating environment, for user's specific workflow. (Special order made)



# Workstation

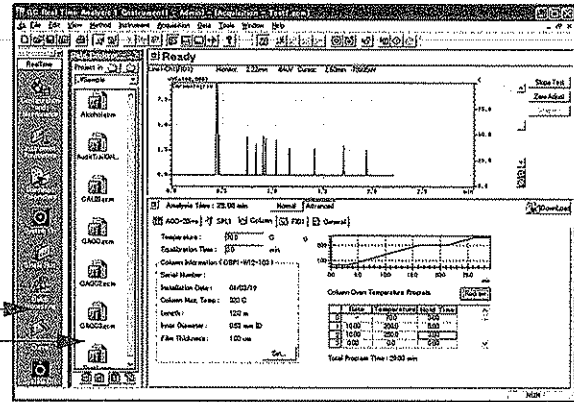
## User Interface

The latest Windows technologies offer multifunctionality and simple operation. User interface including drag-and-drop and right-click menus offers quick and intuitive operation

### Easy-to-operate Assistant Bar and Data Explorer

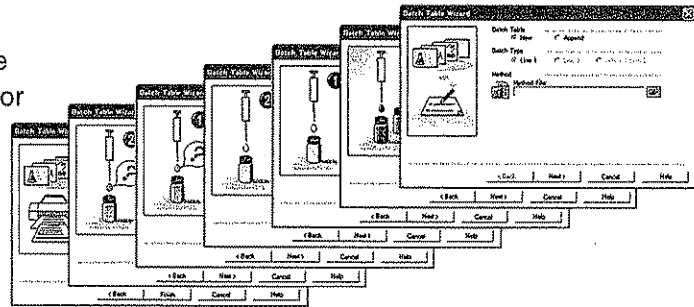
- Navigate operations with Assistant Bar Even novices can easily conduct analysis or re-analysis simply by sequentially clicking on icons.
- Data Explorer displays a list of files by type. Intuitively handle file operations by double-clicking or drag-and-drop.

Assistant Bar  
Data Explorer



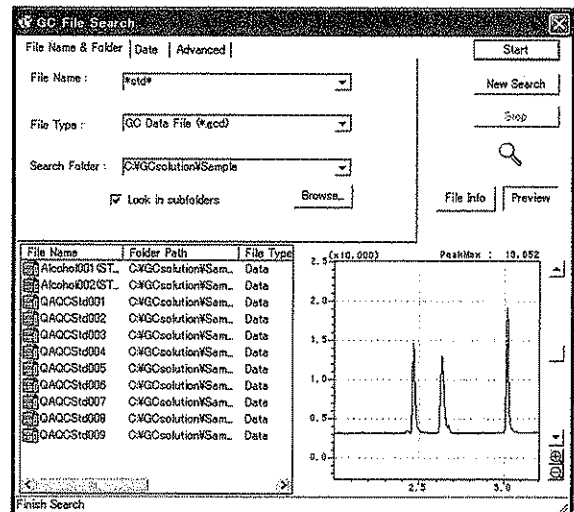
### Batch Table Wizard Simplifies Consecutive Analyses

- Easily create batch tables for consecutive analysis of multiple samples using the Wizard.
- Simply fill in the prompts in the Wizard to create multi-point calibration curves and batch tables for repeated analyses.



### File Search Function offers Convenient Previews

- Search any data file or method file.
- Search by file name, date, operator's name, sample name, or sample ID.
- Use the preview function to check the chromatogram in the searched data files before opening the file.

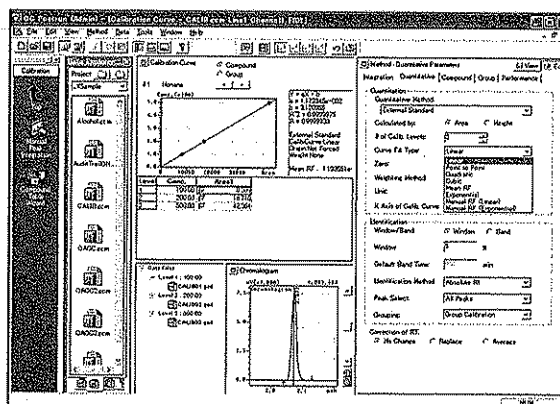


## Data Analysis / Report Generation

Builds on the popular Chromatopac and CLASS-GC10 basic functions, including integration algorithms. Offers comprehensive functions for identification, quantitation, data comparison, and report generation.

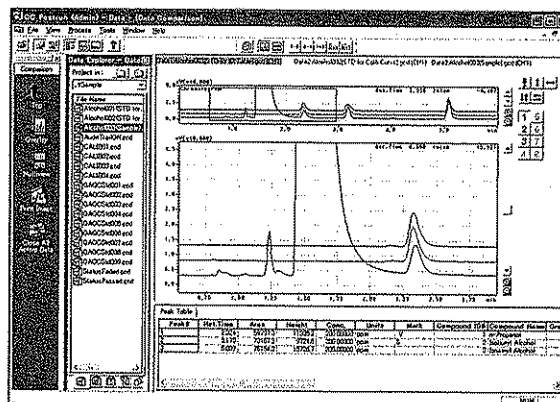
### Identification and Quantitation Functions using Various Types of Calibration Curve

- Support for six quantitation methods, such as external and internal standard methods, and seven types of calibration curve, including linear, point to point and polynomial fits, ensures compatibility with an extensive range of requirements.
- Calibration curves can be created by dragging and dropping data files into the calibration window.



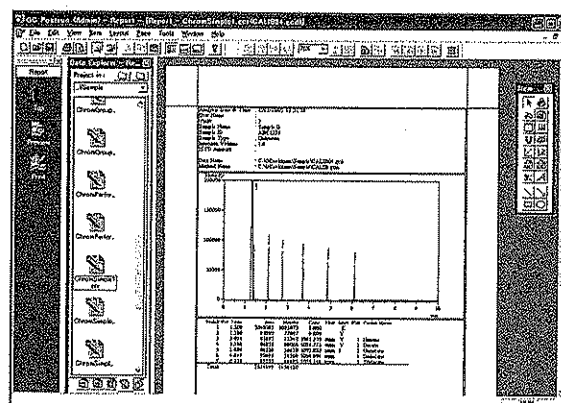
### Data Comparison Function

- Display and compare up to eight chromatograms.
- Convenient for comparison of previous data and investigation of changes in time-course data.
- Select superimposed or split-screen display.
- Conduct detailed analysis using addition, subtraction, differential, and second-order differential operations.



### Flexible Report Generation Functions

- Highly flexible report generation.
- Paste and freely edit chromatograms and peak tables.
- Save report formats as templates.



**GLP/GMP-Functions**

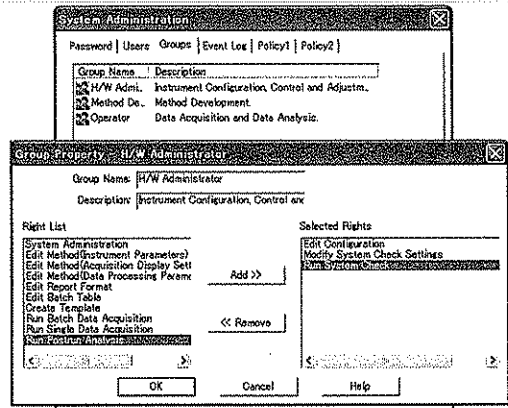
To be compliant with management requirements and regulations such as GLP/GMP, a variety of sophisticated demands related to: analyzer reliability, method development, analysis method validation, and electronic file management must be satisfied to ensure data integrity.

GCsolution Ver. 2 supports GLP/GMP strongly with various validation functions, user management functions and so on.

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

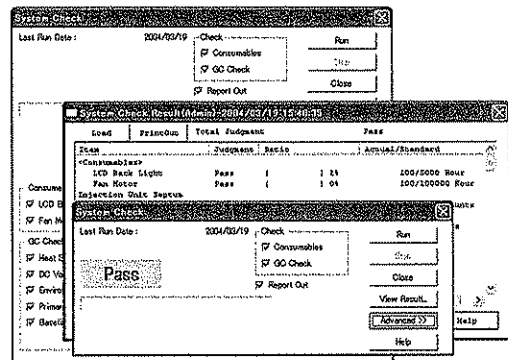
**User Management Functions to Control User Access**

- Limit user access to operations by setting operation restrictions for the Administrator, Method Developer, and Operator default user groups.
- Add or edit groups to create security that matches your laboratory work format.



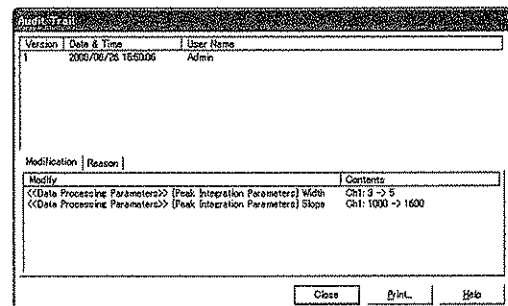
**Validation Support - fully supports GC-2010 self-diagnostic functions**

- Fully supports the GC-2010 self-diagnostic functions. Periodic checks of the GC status supports superior analysis and greater confidence in your results.
- Includes software-validation functions to check for software modifications.
- QA/QC functions offer pass/fail evaluation based on repeatability of component concentrations, recovery rate, or check of concentration upper/lower limit.



**Audit Trail including Parameter Setting Log**

- The changes and the reasons for the changes to instrument parameters and data-processing parameters can be saved to confirm the traceability of consecutive analysis results.
- Data files contain the method used for data acquisition and the latest data, allowing data to be reverted to the pre-analysis state.

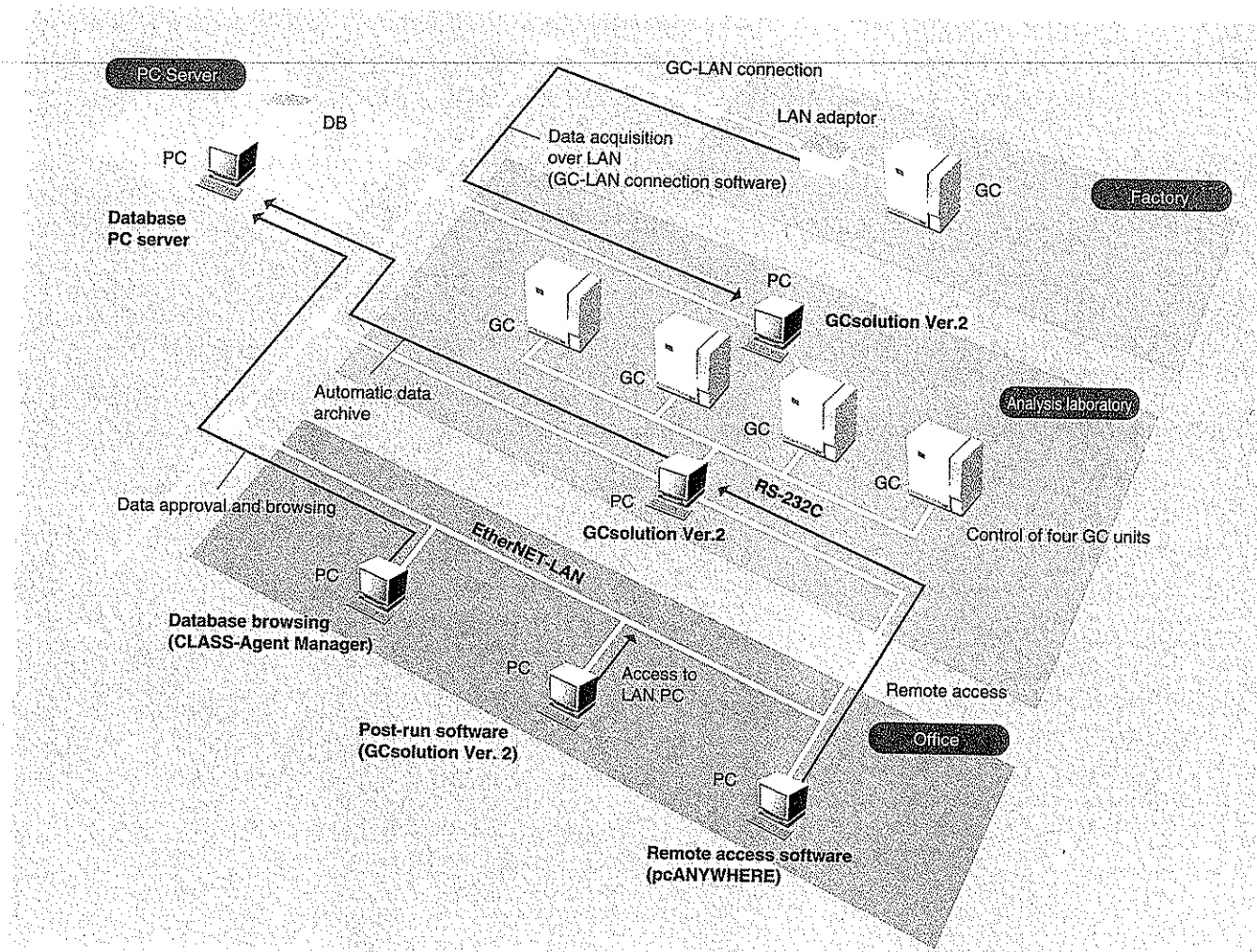




## Network-compatibility

Using a network such as an in-house LAN allows centralized data management and the sharing of files containing data or analysis methods.

In addition to the basic workstation software, GCsolution offers a range of network tools to enhance analysis efficiency.



### CLASS-Agent for Centralized Data Control

#### CLASS-Agent Data Management System

- Software for centralized data management.
- Measured data automatically saved in the database.
- Browsing software easily finds target data.
- Browse data over the Internet.
- Compatible with Oracle, Access, and SQL databases.

#### GCsolution Ver. 2 Post-run Software

- Install the post-run software in a separate PC on the LAN to allow data analysis in the office.

### Remote PC and GC Access

#### pcANYWHERE\* remote access software

- Dedicated software for remote access of a laboratory PC from an office PC.

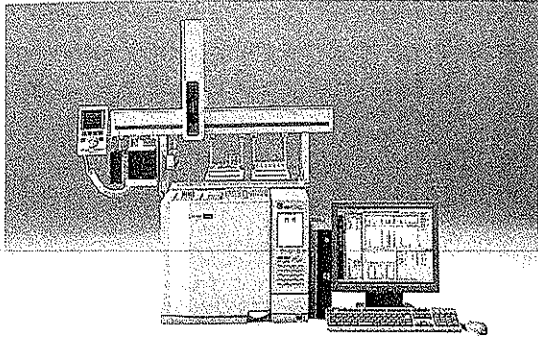
#### GC-LAN connection software

- Offers remote GC control and data acquisition in a LAN environment.
- Connects the GC instrument to PCs over a LAN using a LAN adaptor.

\*pcANYWHERE is a product of Symantec Corporation.



## Application Systems



### Liquid Injection / Headspace Analysis System

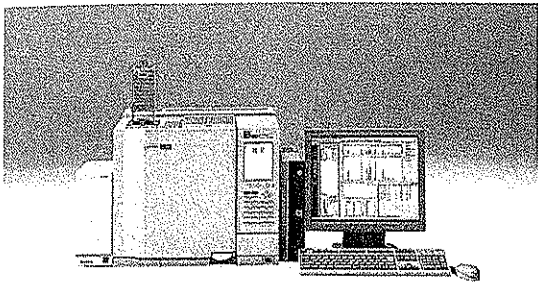
- Liquid large volume and headspace injection in one single instrument.
- Used to analyze the volatile components in solid or liquid samples.

#### System Configuration (GC with headspace sampler)

- GC-2010 + AOC-5000

#### Analysis Applications

- Measurement of residual solvents in pharmaceuticals
- Measurement of aromatic components in foods
- Upgradable to SPME mode (solid micro extraction)



### Pyrolysis System

- Decomposes samples at high temperatures and analyzes the pyrolytic decomposition products.
- Used to analyze high molecular weight compounds such as polymers, forensic samples etc.

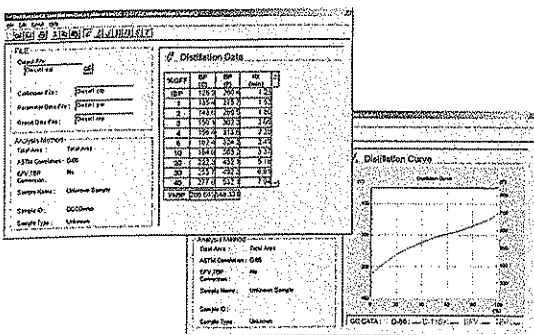
#### System Configuration (GC with double-shot pyrolyser)

- GC-2010 + PY-2020iD

Autosampler and cryotrap accessories available.

#### Analysis Applications

- Characterization of high molecular weight compounds
- Measurement of outgassing from inorganic samples, such as ceramics



### Distillation GC System

- Measures the boiling point distribution of petroleum fractions using the relationship between retention time and boiling point.
- Prints formatted reports after analysis of distillation characteristics.

#### System Configuration (Distillation GC)

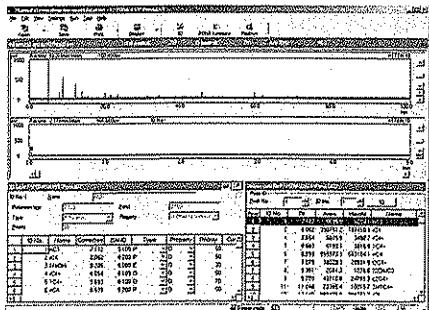
- GC-2010 + WBI-2010, or OCI-2010 + GCsolution

+ distillation GC software

(Select sample injection unit and column to suit the target sample.)

#### Analysis Applications

- Petroleum fractions



### PONA Analysis System

- Separates gasoline or other hydrocarbon compounds; identifies the peaks; classifies them by carbon number, paraffin, olefin, naphthene, and aromatic series; and conducts quantitation.

#### System Configuration (PONA GC)

- GC-2010 + CRG-2010 + GCsolution + PONA solution + MS Excel

(Select sample injection unit and column to suit the target sample.)

#### Analysis Applications

- Categorization of naphtha, gasoline and gasoline-based materials by carbon number and quantitation by type. (Also offers calculation of mean specific gravity, mean molecular weight, and octane value.)

## GC-2010 Specifications

### ■ Column Oven

Temperature range: room temperature + 4°C to 450°C (using liquid CO<sub>2</sub> gas\*): -50°C to 450°C)

Dimensions: 280 (W) x 280 (H) x 175 (D) mm

Oven volume: 13.7 L

Temperature accuracy: set value (K) ± 1% (calibration at 0.01°C)

Temperature deviation: <2°C max. (on 200 mm dia. circumference 30 mm from rear, 115V model)

Temperature variation coefficient: <0.01°C/°C

Temperature program steps: Up to 20 (cooling program possible)

Programmed rate setting range: <250 to 250°C/min.

Total time for all steps: 9999.99 minutes max.

\* Optional parts are required to use liquid CO<sub>2</sub> gas.

### ■ Injection Port

Maximum 3 independently temperature controlled injector units (The quantity that can be mounted simultaneously depends on the injector type) are provided.

Injection port unit: Split/splitless injection unit provided as standard.

#### Split/Splitless Injection Unit (SPL-2010)

Temperature range: room temperature + 5°C to 450°C

#### Direct Injection Unit (WBI-2010)

Temperature range: room temperature + 5°C to 450°C

#### On-column/Programmable Temperature Vaporizer Injection Unit (OCI/PTV-2010)

Temperature range: room temperature + 5°C to 450°C

Heating rate: 50°C to 450°C within 3 minutes

Cooling rate: 450°C to 50°C within 8 minutes (for 50°C column temperature)

Heating program: max. heating rate 250°C/minute, heating in 7 steps

Switching possible between on-column and programmable temperature vaporizer injection units (requires split piping re-connection between OCI and PTV)

To keep instrument specifications, max. 2 injection ports shall be heated simultaneously.

### ■ Detectors

Four detectors can be installed simultaneously and individually temperature controlled.

Detector gas is electronically controlled by APC (Advanced Pressure Control).\*(The quantity that can be mounted simultaneously depends on the detector type)

#### Flame Ionization Detector (FID)

Temperature range: to 450°C

Minimum detected quantity: 1.5 pgC/s (dodecane)

Dynamic range: 10<sup>7</sup>

#### Thermal Conductivity Detector (TCD)

Temperature range: to 400°C

Sensitivity: 20000 mV·mL/mg (decane)

Dynamic range: 10<sup>5</sup>

#### Electron Capture Detector (ECD)

Temperature range: to 400°C

Minimum detected quantity: 8 fg/s (γ-BHC)

Dynamic range: 10<sup>4</sup>

#### Flame Photometric Detector (FPD)

Temperature range: to 350°C

Minimum detected quantity: P 0.2 pgP/s (tributyl phosphate)

S 4 pgS/s (dodecane thiol)

Dynamic range: Phosphorus mode: 10<sup>4</sup>

Sulfur mode: 10<sup>3</sup>

#### Flame Thermionic Detector (FTD, also called NPD or TSD)

Temperature range: to 450°C

Minimum detected quantity: N 0.3 pgN/s (azobenzene)

P 0.03 pgP/s (malathion)

Dynamic range: N, P 10<sup>3</sup>

To keep instrument performance, max. 2 detectors shall be operated simultaneously.

### ■ Flow Control Unit

Advanced Flow Controller (AFC)

#### Split/splitless mode

Pressure setting range: 0 to 970 kPa

Programmable steps: 7 (cooling program possible)

Programmed rate setting range: -400 to 400 kPa/min.

Split ratio setting range: 0 to 9999.9

Total flowrate setting range: 0 to 1200 mL/min.

Column average linear velocity can be kept constant while temperature is increasing.

#### Direct injection mode

• Pressure mode

Pressure setting range: 0 to 970 kPa

Programmable steps: 7

Programmed rate setting range: -400 to 400 kPa/min.

• Flow mode

Flow setting range: 0 to 1200 mL/min.

Programmable steps: 7

Programmed rate setting range: -400 to 400 mL/min/min.

Column average linear velocity can be kept constant while temperature is increasing.

### ■ Display

240 x 320-dot graphics display (30 columns x 16 lines)

### ■ Dimensions, Weight, Power Requirements (GC main unit)

Dimensions: 515 (W) x 440 (H) x 530 (D) mm

Weight: 30 kg (FID model)

Power requirements: AC100V/115V230V ±10%, 1800VA (Normal oven type) or 2600VA (High power oven type), 50/60Hz

## GCsolution Ver. 2 Specifications

### ■ Software Specification

Compatible with Windows XP/2000/NT4.0

32-bit application (long-filename compatible), graphical user interface (Assistant Bar, etc.)

### ■ Instrument Control

Controls GC-2010, GC-2014, GC-17A, GC-14B, AOC-201/s, AOC-5000\*.

Controls up to four GC units (9 detectors simultaneously).

Supports dual injection system with four detectors (GC-2010) or two detectors (non-GC-2010).

\*Control of AOC-5000 requires optional software.

### ■ Data Acquisition

4 ms minimum sampling time, snapshot function, supports single analysis and batch analysis, Batch Table Wizard, add or insert analyses, supports extended analysis time, automatic data file creation, QA/QC (statistical) functions, batch auto-stop function, run user program function, supports pre-run programs, OLE automation compatibility (batch analysis, etc.)

### ■ Data Processing and Data Analysis

Peak integration manipulation, identification (supports multiple relative retention times and grouping), quantitation (percentage area method, corrected percentage area method, internal standard method, external standard method, standard addition method, index calculation, manual coefficient input), calibration points and levels (16 levels x 10 points), manual calibration curve creation, column performance calibration, data comparison functions.

### ■ Report Generation

Over ten types of report item (sample information, environment settings, methods, chromatograms, peak tables, calibration curves, grouping results, diagrams, text, etc.), OLE object compatibility, layout customization and preview functions, summary report

### ■ Files

Data Explorer for file management, All-in-One file structure

File conversion (CLASS-GC10 format, CLASS-VP4 format, AIA ANDI format, text format), file searching, template functions

### ■ Hardware Functions

GC automatic stop/automatic start, system check (GC self-diagnosis), status log

### ■ GLP/GMP-related

Audit trail, software validation, security, Part11 compatibility

### ■ Network Compatibility

Post-run application software (option, secondary right of use), GC-LAN connectivity (option)

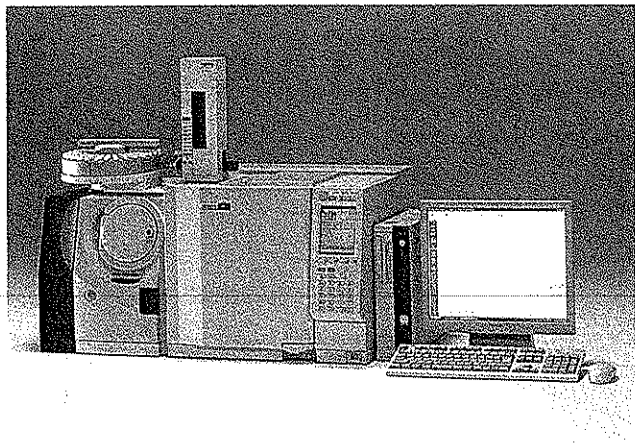
### ■ Other

Maintenance guide (GC-2010, GC-2014, GC-17A, GC-14A/B, AOC-201)

## PC Requirements for GCsolution

- (1) CPU: 1.3GHz or faster,  
RAM: 128 MB or greater  
HDD: 40 GB or greater  
24x speed CD-R/RW, OADG keyboard  
100BASE-TX/10BASE-T LAN interface
- (2) Software  
Windows XP Professional
- (3) Display
- (4) 1 x RS-232C cable 2m for connecting to GC-2010

The GCMS-QP2010 Plus provides optimum performance analysis for all GCMS measurements. High-speed GCMS capability and optimum separation are standard with every GCMS-QP2010 Plus. Our GCMS with Lab Solutions software can analyze more unattended samples than any other product. Unique system checking verifies ideal operation. The GCMS-QP2010 Plus and GC-2010 continue the tradition of performance and maintenance simplicity - Shimadzu trademarks.



## Gas Chromatograph-Mass Spectrometer

### GCMS-QP2010 Plus

- Superior High-Speed GCMS
- 20 Temperature Ramps and patented Constant Linear Velocity for optimum separation
- Front-opening chamber for easy maintenance
- Pump down in under 4 minutes and input up to 15mL/min flow into the ion source.
- Automatic Adjustment of Retention Time (AART)
- Fast Automated Scan/SIM Type (FASST)
- Creation of Automatic SIM (Scan/SIM) Table (COAST)
- The direct inlet probe is available for less volatile and/or thermally labile samples.



JQA-0376

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



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