



YL6500 Gas Chromatograph

Specification Sheet

1. YL6500 Gas Chromatograph

1. Intuitive graphic user interface with large touchpad color LCD (5.7").
2. Automatic loading and saving up to 20 different analytical methods.
3. High speed data process by network (LAN) communication.
4. Various inlets and detectors installable up to three per each.
5. Time control : Automatic turn-on/off
6. Ten heated zone : 1 heated oven zone
3 heated injector zone
3 heated detector zone
2 heated valve zone
1 heated methanizer zone

1) Gas Chromatograph YL6500 GC Oven System Module

- (1) Usable volume : 14L
- (2) Automatic cooling under processor control
- (3) Temperature operating range : 4°C above ambient to 450°C or more
-80°C ~ 450°C (with LN₂ cryogenic cooling)
-40°C ~ 450°C (with CO₂ cryogenic cooling)
- (4) Temperature set-point : 0.1°C
- (5) Programming: 25 ramps, 26 steps temperature program

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- (6) Maximum heating rate: 120°C/min
- (7) Maximum heating set point rate: no limitation
- (8) Run time: Maximum 9,999 min
- (9) Cool down rate: 6.5 minutes from 450°C to 50°C
5.5 minutes as option
- (10) Temperature program method: Maximum up to 20
- (11) Temperature stability: $\pm 0.01^{\circ}\text{C}$ (Isothermal), $\pm 0.1^{\circ}\text{C}$ (Gradient)
- (12) Improved column conditioning function: Automatic set of split flow up to 5 ml/min on column conditioning
- (13) Prevention of oven malfunction (Over heating)
- (14) Heated Device: 10 heated zones standard
 - a. 1 heated oven zone
 - b. 3 heated injector zone
 - c. 3 heated detector zone
 - d. 2 heated valve zone
 - e. 1 heated methanizer zone

2) Inlet

- Maximum no. of installation: three)

(1) Packed inlet

- a. Maximum Temperature : 450 °C
- b. Pressure setting range : 0.001 ~ 100 psi (optional 150 psi)
- c. Total flow setting range : 0.01~100 ml/min
- d. Flow stability < $\pm 0.05\text{ml/min}$
- e. Pressure stability < $\pm 0.005\text{psi}$
- f. Temperature set point : 0.1°C
- g. Temperature stability < $\pm 0.1^{\circ}\text{C}$

(2) Capillary inlet (Split/Splitless)

- a. Maximum Temperature : 450°C
- b. Pressure setting range : 0.001 ~ 100 psi (optional 150 psi)
- c. Total flow setting range : 0.01 ~ 400 ml/min N_2 / 0.01 ~ 1000ml/min He/ H_2
- d. Splitless time set point : 0.01min
- e. Total Flow stability < $\pm 0.05\text{ml/min}$
- f. Pressure stability < $\pm 0.005\text{psi}$
- g. Temperature set point : 0.1°C
- h. Temperature stability < $\pm 0.1^{\circ}\text{C}$
- i. Maximum split ratio: 7,500 : 1

- j. Column ID: 0.05 to 0.53 mm ID
- k. Septum purge: Fixed
- (3) On-column inlet
 - a. Maximum Temperature : 450 °C
 - b. Pressure setting range : 0.001 ~ 100 psi
 - c. Total flow setting range : 0.01 ~ 100 ml/min
 - d. Flow stability < ±0.05ml/min
 - e. Pressure stability < ± 0.005psi
 - f. Temperature set point : 0.1 °C
 - g. Temperature stability < ±0.1 °C
 - h. Temperature programming up to 5 steps

3) Advanced Pneumatic Control

- (1) Up to 6 APC blocks for inlets, detectors or auxillary gases
- (2) Increased precision and accuracy in pressure and flow rate
 - : Increased the number of times sampling for flow and pressure
 - : Increased the number of times controlling for valves
 - : Shockproof APCs
 - : Automatic compensation for temperature & pressure in installation condition
- (3) Up to 6 APCs can be installed and up to 18 channels of APC
- (4) Flow setpoint : 0.01ml/min
- (5) Pressure setpoint : 0.001psi
- (6) Pressure display value: 0.001 psi
- (7) All gas flows controlled by APC
- (8) Available gasses : N2, He, H2, Air, Ar/CH4
- (9) Board for use of APC control : APC Main B/D
- (10) Constant Flow
- (11) Constant Pressure
- (12) Programmed Flow : 5step
- (13) Programmed Pressure : 5step
- (14) Leak detection
- (15) Gas saver

4) Detector

- Maximum no. of detector installation: three
- Data Acquisition Rate : 200 Hz

- (1) Flame Ionization Detector
 - a. 450 °C maximum operating temperature

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- b. Automatic flame ignition
- c. Temperature set-point : 0.1 °C
- d. Ignition message: Alarm message as 'Flame out'
- e. MDL : 1.5 pg carbon/sec (dodecane)
- f. Linear dynamic range : 10^7
- g. Temperature stability : $\pm 0.1^\circ\text{C}$
- h. Air : 0.1~500 ml/min
- e. H₂ : 0.1~100 ml/min
- f. Make-up gas : 0.1~100 ml/min

(2) Thermal Conductivity Detector

- a. 400°C maximum operating temperature
- b. Flow through cell : 4 Rhenium-Tungsten filaments
- c. MDL : 2.5 ng/ml (Standard), 400 pg/ml (uTCD)
- e. Filament protection
- f. Temperature set-point : 0.1 °C
- g. Micro-cell (Option)
- h. Ref : 0.1~100 ml/min
- f. Make-up : 0.1~100 ml/min

(3) Nitrogen-Phosphorous Detector

- a. 400°C maximum operating temperature
- b. MDL : <0.2pg N/s, azobenzene, **<0.02pgP/s, parathion methyl**
- c. Dynamic Range for N : $> 10^4$
- d. Dynamic Range for P : $> 10^4$

(4) Flame Photometric Detector

- a. FPD sensitive to sulfur- or phosphorus-containing compound.
- b. Allows working either in S-mode or P-mode depending on installed colour filter.
- c. Suitable for capillary or packed columns
- d. MDL (for parathion methyl) **<1.0 pg S/s**, <0.2 pg P/s;
- e. Linear dynamic range $> 10^3$ (S), $> 10^4$ (P)
- f. Max. Temperature = 300°C
(not recommended due to PMT overheating, limited heating up to 250°C)
- g. Electronic gas control – YES
- h. Automatic flame ignition / re-ignition – YES

(5) Pulsed Discharge Detector

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- a. 400°C maximum operating temperature
- b. APC supported to a column flow
- c. Helium ionization mode(PDHID) : Linearity – 10^5
 MDL (organic compound : low ppb)
 (permanent gas : low ppm)
- Optional model: Electron capture mode(PDECD) : Linearity – 10^5
 MDL – 10^{-15}
 Dopant gas : 3% Xe in Helium

(6) Micro-Electron Capture Detector

- a. Maximum Operating Temperature: 450 °C
- b. Minimum Detection Limit: 4.4 fg/sec (by Lindane standard)
- c. Linear Dynamic Range: $> 0.5 \times 10^4$
- d. Gas Control: APC (Advanced Pneumatic Control)
- e. Radiation Source: ^{63}Ni

5) Gas Sampling Valve

- (1) Up to 4 gas sampling(or Switching) valves(option: totally **8 valves**)
- (2) Maximum **20 methods** for gas valve switching
- (3) Various gas sample loops available
- (4) Purge housing option for very low trace level analysis

6) Nickel Catalyst Methanizer Assembly

- (1) Reaction Chamber Assembly for high performance methanization
- (2) Cartridge heater and RTD sensor for temperature controlling of Methanizer chamber
- (3) Maximum Operating Temperature: 400 °C

2. Chromatography Data System

YL-Clarity Chromatography Data System

- (1) Full control of YL6500 GC & ChroZen GC
- (2) Measuring: Simultaneous data acquisition from up to four independent chromatographs, each chromatograph can acquire data from up to 12 detectors.
- (3) Integration: There is extensive possibility to modify chromatograms. The chromatogram can be changed by entering global parameters or interactively, through direct graphic modification of the baseline.
- (4) Overlay: Simultaneously displays a virtually unlimited number of chromatograms and their mathematical modification; for example, mutual deductions or derivations of any order.
- (5) Calibration: Internal and external standard calculation methods, calibration of groups of peaks

and reference peaks method for better identification.

- (6) Automated measuring support: Sequence tables for any set of samples with or without an autosampler.
- (7) Postrun: Automatically displays, prints, exports and starts other programs after the completion of a measurement.
- (8) Summary result tables: Displays and prints selected results from all simultaneously displayed chromatograms.
- (9) User settings: User selects parameters for peak display and the specification for axes, including color from an extensive array of color settings. Text labels and lines, either as part of the area or anchored to a chromatogram, may also be inserted.
- (10) Export: Optional exportation of all results, with or without the chromatogram, in various formats, into a file or clipboard.
- (11) Import: Imports chromatograms or mathematical curves, which have been saved in text or AIA formats, from other programs.
- (12) Method and calibration history: Each chromatogram can easily be displayed under the same conditions as when it was printed, exported or saved.
- (13) Column performance: Calculations of peaks in terms of symmetry, efficiency, resolution; all by several methods (tangent, moments, etc.).
- (14) Batch: Automatically batch processes, displays, exports or prints any number of chromatograms.
- (15) User calculations: Users can define custom calculations in the Result and Summary tables. Using the integrated editor you can create your own columns from original columns and individual mathematical functions.
- (16) User accounts: Sets up access rights and passwords (including their parameters e.g., minimum length, validity, etc.). Each user can define his or her own station appearance.
- (17) Audit trail: Records selected events and operations into a special file. Records selected operations directly into a chromatogram.
- (18) Electronic signature: Each chromatogram can be signed electronically. Signature selection is based on the username or the signature certificate.
- (19) Networked Solution: Clarity chromatography station files can be accessed from networked computers using Clarity software. This enables the offline evaluation of chromatograms, development of new methods and printing reports.
- (20) 21 CFR Part 11: Clarity Satisfies with the requirements of the 21 CFR Part 11 directive of the FDA.
- (21) Operating Windows: Microsoft Window 2000, XP, Vista, 7, 8 and 10

3. Warranty

- 1 year after installation date

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