

# GPC HLC-8321GPC/HT



**TOSOH BIOSCIENCE**  
Innovations in Separations and Purification

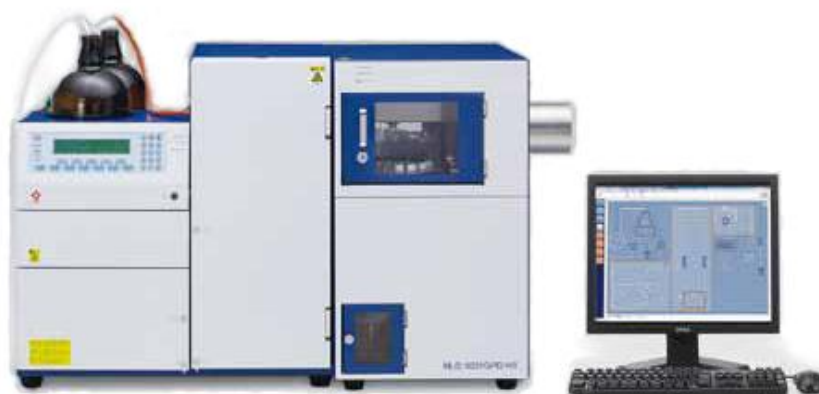
## GPC System HLC-8321GPC / HT



## Tosoh High Temperature GPC System

### HLC-8321GPC/HT

The HLC-8321GPC/HT is a dedicated high temperature GPC system applicable to various polymers like polyolefin, PPS, etc. The combination of this high temperature GPC system's superior utility, safety and environmental friendliness, and the "GPC workstation 8321GPC-WS" software enables high quality GPC measurement.



## Compounds

Part #	Description	Quantity
0023800	High Temperature GPC System HLC-8321GPC/HT	1
0023801	Sample Preparation System DF-8321	1
0023802	GPC Workstation 8321GPC-WS	1
0023804	Column Switching Valve (8321)	1



## Product view



Autosampler



Operator panel



Column oven



Pump Unit



## Features

### Compatible up to 220°C

Controllable up to 220°C. Applicable to polymers like PPS, which dissolve in organic solvent at only high temperature in addition to polyethylene and polypropylene.

### Stable Baseline

Refractive index detector (RI detector), which consists of double path & double flow system improved its stability by optimization of temperature control system for optical block.

### High-speed Start-up

High-speed start-up is realized by built-in heater dedicated for RI detector. GPC measurement can be started in 3 hours under the condition of ODCB solvent at 145°C.

### Well Organized Safety System

As the GPC system is safety considered, auto-lock doors are equipped to column oven and auto-sampler. Duct for local ventilation also is equipped in Auto-sampler unit.

### Easy Operation

Using GPC workstation '8321GPC-WS', the system can be easily operated through warm-up, analysis and shut-down.

The main unit can also be independently controlled using operator panel on the hardware.

Report can be customized by report/layout system in the software.

### Global Standard

Compliant with FDA 21 CFR Part 11\*

(\* Authentication using User ID and password, logout when finished, software validation, etc.)



## Options

### Sample preparation system DF-8321

Part # 0023801

DF-8321 is a sample pretreatment system dedicated to high temperature GPC system HLC-8321GPC/HT. The system dissolves and filtrate target samples at a time, which is cumbersome work in general and improves working efficiency.



### Specification of DF-8321

Specification	Description
<b>Heater unit</b>	
Method	Aluminum block heating, PID control
Shaking frequency	10 – 100 round trip / min
# of sample vials	24
Temperature range	40 – 220 °C (1 °C step)
Safety systems	Monitoring by temperature sensor – embedded , Software, Thermostat (250 °C) - circuit
<b>Power supply ratings</b>	
Voltage	AC 100 – 240 V
Frequency	50/60 Hz
Power consumption	400 VA
<b>Dimensions and weight</b>	
Outside dimensions	300 (W) × 200 (H) × 315 (D) mm (excluding projections)
Weight	15 kg





### Column Switching valve

Part # 0023804

Handle and tubings attached



### Sample Vials

Part # 0023809

Transparent, 10 mL, Qty;30, cover(PTFE) attached



### Meshes

Part # 0023811 , Stainless mesh 26  $\mu\text{m}$ , 50 mm square, Qty; 100, 500 mesh

Part # 0023812 , Stainless mesh 96  $\mu\text{m}$ , 50 mm square, Qty; 100, 180 mesh

### Aluminum Sheet (30 mm square)

Part # 002310 , Qty; 100

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## GPC Workstation 8321GPC-WS

Part # 0023802, OS : Windows® 7 (32bit)

The GPC Workstation 8321GPC-WS comprises system control and data analysis software for use with HLC-8321GPC/HT.

Using USB connections, two systems can be controlled and used for analysis.

This software provides molecular weight analysis with excellent operability and high precision and allows ease of use without changing the essential concepts of analysis.



## Easy Operation

Setting of items is simplified by introducing the concept of the PROJECT. In addition, the data management and analysis screens are integrated for enhanced operability.

Compliant with

FDA 21 CFR PART 11

Authentication with user ID and password, logout method, and software validation are designed to be easily set by the user.

## Acquisition Application

### Flow Diagram

Realtime display allows system status monitoring and easy on-screen operation. The display differs depending on the operating status of the device.





### USB Connection

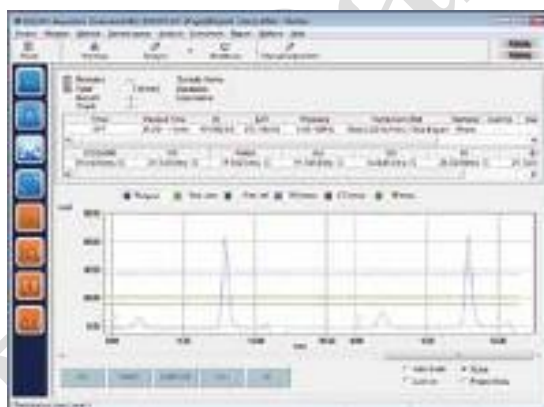
USB connection allows realtime data acquisition. No interface board is necessary.

Multiple Word® Report Formats and Print Layouts

8 kinds of standard format are available for chromatogram reports. The chromatogram scale and output items can be changed as required. Print formats from other computers can be imported. The print layout can also be changed.

### Monitor

As well as RI signal, various types of information can be monitored from the system in real time. All information can be monitored on a multi-axial display to allow easy and clear viewing of analysis status.



Specifications	Description
Media	CD-ROM
Applications	Data acquisition, data analysis, data management, report layout, analytical method validation, and operator manual





Data Acquisition	
Data acquisition	2-channel (RI, UV)/1-system USB connection
Acquisition time	0.0 to 999.9 min
Acquisition interval	50 ms or more (10 ms steps) Upper limit: 1000 ms
Data Analysis	
Calibration Curve	First-degree expression, 3rd-degree expression
Approximation	3rd-degree expression + hyperbola, 5th-degree expression 7th-degree expression, 7th-degree expression (odd power) 7th-degree expression (odd power) + hyperbola
Calibration Curve Correction	Mark-Houwink, Q factor, polymerization degree, USP
Quantitative Calculation	Number, weight, Z average, viscosity average molecular weight calculation, derivative/integral molecular weight, concentration ratio
Special Calculation Function	Internal standard correction function, copolymer analysis, molecular weight fraction specific calculation, calculation range specification, lag time correction
Column Test	Theoretical plate number, resolution, symmetry factor, half bandwidth
Calculation Standard	ASTM, DIN, USP, JIS, JP, ISO 16014, Tosoh Standard
Other	Search, statistical calculation
Data Management	
Record Format	Microsoft® Access®
Record Items	Raw data, analytical conditions, calculation results, instrument information
System Control	
Number of System Controls	2-system GPC (requiring two USB cables)
Instrument	For use with HLC-8321GPC/HT only
GPC Support Program	
Function	Peak separation processing, GPC-8020 model II data converter, text converter, AIA converter
Compliant with FDA 21 CFR PART 11	
Function	Software validation, authentication by user ID and password, logout, and audit trail



## Specifications

SPECIFICATION	DESCRIPTION
<b>Solvent Stocker</b>	
Bottle	3L bottle × 1
Method	Hot-air circulation, PID control
Temperature	40°C (5°C higher than room temperature)
Safety Systems	Monitoring by temperature sensor – embedded software, Thermal fuse (70°C) – circuit, Liquid drain
<b>De-gas Unit</b>	
Method	Vacuum type
<b>Purge System</b>	
Method	Syringe type
<b>Pump Oven</b>	
Method	Hot-air circulation
Temperature	40 - 50°C (1°C step, 10°C higher than room temperature)
Safety Systems	Monitoring by temperature sensor – embedded software, Thermal fuse (70°C) – circuit, Gas sensor, Door sensor, Liquid drain
<b>Pump</b>	
Flow Mode	Parallel (Quick return)
Flow Rate Range	0.10 – 2.00 mL/min (0.01mL step) The reference flow rate is set in the ratio[1, 1/2, 1/4] with the sample flow rate
Accuracy	± 2% or ± 0.005mL/min whichever greater (H <sub>2</sub> O, 1 MPa or more, 1.2mL/min or less)
Precision	± 0.2% or ± 0.001 mL/min whichever greater (H <sub>2</sub> O, 1MPa or more, 1.2mL/min or less)
Pressure Setting Range	0.0 – 15.0MPa (0.1MPa step)
Drain Valve	Electroactuation
<b>Autosampler</b>	
Measuring Method	Loop measurement
Sample Loop	300μL (500 μL loop is attached, 10 – 500μL loop is available)
Reproducibility	CV 0.5 %
Number of Vials	24
Vial Volume	10 mL
Temperature Control Method	Aluminum block heating, PID control (sample table)
Range	40 -220°C (1°C step, 10°C higher than room temperature)
Safety Systems	Monitoring by temperature sensor – embedded software, Thermostat (250°C) – circuit, Door lock during table moving, Sample cup sensor, Needle crash sensor, Duct for local ventilation

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<b>Valve Box (temperature control for injection valve)</b>	
Method	Aluminum block heating, PID control
Range	40 - 220°C (1°C step, 10°C higher than room temperature)
Maximum Pressure	15 MPa
Safety Systems	Monitoring by temperature sensor – embedded software, Thermostat (250°C) – circuit, Gas sensor
<b>Column Oven</b>	
Method	Hot-air circulation, PID control
Range	40 - 220°C (1°C step, 10°C higher than room temperature)
Column Capacity	30cm columns × 8, guardcolumn × 1, Inlinefilter × 1
Safety Systems	Monitoring by temperature sensor – embedded software, Thermostat (250°C) – circuit, Gas sensors (2) , Door lock at high temperature, Door sensor, Liquid drain
<b>RI Detector</b>	
Method	Bryce type double path and dual flow
Light Source	Tungsten lamp
Flow Cell	Made of quartz glass, volume; 10μL, Maximum pressure; 0.3MPa
Drift	$3 \times 10^{-7}$ RIU/h (ODCB, 1.0 mL/min, 145°C)
Noise	$1.5 \times 10^{-8}$ RIU (ODCB, 1.0 mL/min, 145°C, response; 3 s)
Temperature Range	40 - 220°C (1°C step, 10°C higher than room temperature)
Safety Systems	Monitoring by temperature sensor – embedded software, Thermostat (250°C) - circuit
<b>Drain Stocker</b>	
Bottle	3L bottle × 1
<b>I/O Terminals</b>	
PC Communication	USB
<b>Power Supply Ratings</b>	
Voltage	AC 100 – 240V
Frequency	50/60Hz
Power consumption	1500VA
<b>Dimensions and Weight</b>	
Outside Dimensions	1000 (W) × 650 (H) × 500 (D) mm (excluding projections)
Weight	125kg