

Gas Chromatograph Accessories and Supplies



Shimadzu Gas Chromatography

Gas chromatography requires various peripherals and supplies depending on the analytical purpose, especially as it relates to gas management, flow line configuration, column installation, sample injection and data processing. This brochure introduces various accessories and supplies that support Shimadzu GC instruments.



Nexis GC-2030 + AOC-20i Plus/20s Plus (Option)

Gas Chromatograph Nexis GC-2030

By using an electronic flow controller (AFC) to precisely control carrier gas flow at the high pressure and flowrate levels required for high-speed analysis and by optimizing the sample injection unit to achieve excellent reproducibility, the Nexis GC-2030 is the ideal gas chromatograph for improving the accuracy and productivity of analysis operations.

- Column Temperature: (Room temperature + 2 °C) to 450 °C
- Carrier Gas Control: Digital setting of pressure, flow rate, and split ratio by electronic flow controller (AFC) Constant control of column average linear velocity
- Sample Injection Unit: Split/splitless, total volume on-column injection, and programmed heating
- Detectors: FID, TCD, BID, FTD, FPD, ECD
- Display: Touch panel with 24-bit color

(Cat. No. C184-0059)

GC-2030 ATF Model

This model features a split/splitless sample injection unit and TCD and FID detectors for use with microvolume capillaries.

GC-2030 AF Model

Equipped with a split/splitless sample injection unit and FID detector, this model is used for detection of organic compounds in general.

- Detector: Flame ionization detector
- Detector Temperature: Up to 450 °C
- Min. Detection Quantity: 1.2 pg C/s
(when using dodecane and high-purity air)

GC-2030 AT Model

This model features a split/splitless sample injection unit and TCD detectors for use with microvolume capillaries. It enables high-separation analysis of a wide range of samples, including inorganic gases.

- Detector: Dual-filament thermal conductivity detector
- Detector Temperature: Up to 400 °C
- Sensitivity: Min. 20,000 mV·mL/mg (decane)



GC-2014 + AOC-20i (Option)

Standard Capillary and Packed Gas Chromatograph

GC-2014 Series

The GC-2014 offers high expandability and flexibility with the ability to mount multiple injectors and detectors. Available for both packed and capillary columns, it offers an excellent user interface with a large LCD, digital gases control and auto-diagnostics, and innovative technology for all injectors, detectors and flow controllers.

- Temperature Range: (Room temperature + 10°C) to 400°C
- Carrier Gas Control: Digital setting by electronic flow controller (AFC)
- Sample Injector: Dual packed, single packed, split/splitless, direct injection
- Detectors: FID, TCD, FTD, FPD, ECD
- Display: 30 characters x 16 lines, permits chromatogram display

(Cat. No. C184-E014)



GC-2025 + AOC-20i (Option)

Energy-Saving Gas Chromatograph

GC-2025 Series

GC-2025 is a new-generation gas chromatograph which minimizes environmental impact by reducing power and carrier gas consumption while retaining the performance capabilities required for capillary analysis. The compact GC-2025 incorporates a digital flow controller that controls both the carrier and detector gases and a newly designed energy-saving column oven that features small volume and less heating loss, realizing a dramatic improvement in operability.

- Temperature Range: (Room temperature + 10°C) to 400°C
- Carrier Gas Control: Digital setting of pressure, flow rate and split ratio by electronic flow controller (AFC)
Constant control of column average linear velocity
- Sample Injector: Split/splitless
- Detectors: FID
- Display: 30 characters x 16 lines, permits chromatogram display
- Minimum Detected Quantity: 2.0 pgC/s (dodecane)

(Cat. No. C184-E026)



Basic Gas Chromatograph

GC-8A Series

GC-8A is economical and simple to use. It supports a single detector, manual pressure or flow control, on column injection port(s), and analog output. GC-8A is only 17.3 inches (43.9 cm) wide, yet its large oven facilitates simple column installation and maintenance.

- Digital Temperature Programmer
- Constant-current TCD, FID with cylindrical collector, Constant-current ECD

(Cat. No. C184-E016)



Capillary Gas Chromatograph

GC-2010 Plus Series

The GC-2010 Plus represents a new generation in top end capillary GC analysis, redefining sensitivity limits for trace analysis, fast GC applications, and easy, robust operation. Advanced Flow Technology (AFT) capability further extends the applications scope of the instrument, allowing multidimensional GC, capillary backflush, and other specialized flow applications. AFT additionally enables reduced analysis times, enhanced chromatographic resolution, and application-specific configurations without compromising key performance features.

Note: All except for certain models are available.

Contents

	Description		P/N	Applicable models *1				Applicable models *2	Remarks	Page	
				GC-2030	GC-2014	GC-2025	GC-8A				
Parts for Nexis GC-2030	ClickTek Nut		-	✓						6,7	
	ClickTek Connector		-	✓							
	ClickTek Adapter		-	✓							
	Valve Warming Box		-	✓							
	Hydrogen Sensor		221-78910-41	✓							
	Oven Light Unit		221-78939-41	✓							
Workstation/ Data Processor	Integrated Workstation		LabSolutions	-	✓	△		1 2 6 7		8	
	GC Workstation		GCsolution Ver.2	-		✓	△	1 2 3 4 6 7	Windows 7 only		
	Simulated Distillation GC Software		223-61510-92						for LabSolutions		
	HS-20 Support Kit		223-07736-92						for LabSolutions		
	HS-10 Support Kit		223-07740-92						for LabSolutions		
	PONAsolution		221-57833-92						for GCsolution		
	Chromatography Data Acquisition Module		CBM-201m	221-80265-58					for LabSolutions	Non RoHS only	
	Communication Bus Module		CBM-102	See article					for LabSolutions and GCsolution		
	Direct-connection Signal Cord		See article								
	External Device Controller	PRG-2030		221-78880-41	✓						9
		PRG-2010 Plus		221-49387-44		✓			6 7		
		PRG BOX		221-49388-41	✓	✓			6 7	100-115V	
		221-49388-44	✓	✓			6 7	for 230 V			
Chromatopac		C-RBA (SD card version)	See article	✓	✓	✓	✓	1 2 3 4 5 6 7	Non RoHS only		
Expansion Case		223-04592-91							for C-RBA	10	
Chart Paper		See article							for Chromatopac		
Sampling Device	Auto Injector		AOC-20i Plus	221-80970-58	✓					11	
			AOC-20i	221-72315-58					6 7		
			AOC-20i	221-72314-58		for 2014					
			AOC-20i	221-73957-58			✓				
			AOC-20i	221-72354-48		△	△		1 2 3 5 6 7		
	Auto Sampler		AOC-20s Plus	221-80975-58	✓					12	
		AOC-20s	221-72300-58		△	✓		1 2 3 4 5 6 7			
Headspace Sampler	HS-20		See article	✓				6 7	13		
	HS-20 Trap		See article	✓				6 7			
	HS-20 LT		See article	✓	△			7			
	HS-10		221-76862-12	✓	✓			7			
Valve / Valve Applied Device	Gas Sampler		MGS-2030	221-78990-41	✓				14		
			MGS-2010	221-75363-41				7			
			MGS-4	221-42574-02		△		△		2 3 6 7	
			MGS-5	221-42576-41		△		△		2 3 6 7	
	Cryogenic Work Attachment		CRG-8	221-24660-92				✓		100V	
	Cryogenic Valve Unit		CRG-2030 CO ₂	221-78900-41	✓						
		CRG-2010 CO ₂	See article		✓			6 7			
		CRG-2025 CO ₂	See article			✓					
		CRG-2010 LN ₂	See article		✓			6 7			
		Solenoid valve LN ₂	See article				△	3 5			
Detector	Flame Ionization Detector		FID-2030	See article	✓				15		
			FID-2010 Plus	See article				6 7			
			FID-2014 Single	See article							
	Supply Gas Shut-off Solenoid Valve Unit		221-70782-41		✓						
	Flame Monitor		FLM-2	221-41590-91		△			3 6 7	100V	
			FLM-2	221-41845-97			✓		1 2	100V	
	Methanizer		MTN-1	221-41820-92	△	△		△	1 2 3 4 5 6 7	115V	
	Flame Thermionic Detector		FTD-2030	See article	✓					16	
			FTD-2010 Plus	See article					6 7		
			FTD-2014	See article		✓					
		FTD-2014C	See article		△						
FTD Collector Regeneration Kit		221-49079-91		✓	△						
Barrier Discharge Ionization Detector		BID-2030	See article	✓					7		
		BID-2010 Plus	See article								

*1 Applicable models: ✓ Applicable △ See article or contact us. Blank is not applicable.

*2 Applicable previous models: ○ Applicable ● See article or contact us.

① GC-14A ② GC-14B ③ GC-17A Series ④ GC-1700 ⑤ GC-18A ⑥ GC-2010 ⑦ GC-2010 Plus

	Description		P/N	Applicable models *1				Applicable models *2	Remarks	Page	
				GC-2030	GC-2014	GC-2025	GC-8A				
Detector	Flame Photometric Detector	FPD-2030	See article	✓						17	
		FPD-2010 Plus	See article					⑦			
		FPD-2010	See article					⑥			
		FPD-2014	See article		✓						
	Interference Filter		See article	Please refer to the article.							
	Photomultiplier Purge Kit		See article	Please refer to the article.							
	Thermal Conductivity Detector		TCD	-	Please request a GC system pre-installed with TCD.						
	Capillary Adapter for TCD		221-34012-91		✓				①②	18	
	Preamplifier		AMP-7B	221-41816-91			✓		①②		
	Electron Capture Detector	ECD-2030		221-77540-42	✓					19	
ECD-2010 Exceed		221-77550-42					⑦				
ECD-2010 Plus		221-47733-42					⑥⑦				
ECD-2014		221-75032-42		✓				115V			
		221-75032-44		✓				230V			
ECD Cell		See article	Please refer to the article.								
Sample Injection Unit	Split/Splitless Sample Injection Unit	SPL-2030	See article	✓					20		
		SPL-2010 Plus	See article					⑦			
		SPL-2014	See article		✓						
		SPL-2010	See article					⑥			
	Wide-Bore Injection Unit	WBI-2030		See article	✓						
		WBI-2010 Plus		See article					⑥⑦		
		WBI-2014		See article		✓					
	WBI-2014 (AMC)		See article		✓						
	On-column/Programmed Temperature Vaporization Injection Unit	OCI-2030		See article	✓						
		PTV-2030		See article	✓						
		OCI/PTV-2010		See article					⑥⑦		
	Single Packed Injection Unit		Single INJ-2014	See article		✓					
	Wide-Bore Capillary Column Attachment		221-29992-91		✓			✓	①②		
	Splitter Attachment		CLH-800	221-23743-91				△		for GC-8APF	
	Injection Port Septum		See article	Please refer to the article.							
Glass Insert		See article	Please refer to the article.						22,23		
Nut and Ferrule for Capillary Column		See article	✓	✓	✓	✓		①②③④⑤⑥⑦	24		
Air Generator	AGE-1000		221-74500-03	△	△	△	△	①②③④⑤⑥⑦	115V, only for FID		
			221-74500-02	△	△	△	△	①②③④⑤⑥⑦	230V, only for FID		
	Air Compressor		Oil-less Type	221-72380		△		✓	①②③④⑤⑥	100V	
GC Running Accessories Set		See article	✓	✓	✓	✓		①②③④⑤⑥⑦			
FID Operation Parts Set		See article	✓	✓	✓	✓		①②③④⑤⑥⑦			
Pressure Regulator for High-Purity Gas	PPR-N ₂		221-35999-01	✓	✓	✓	✓	①②③④⑤⑥⑦	for Nitrogen or Argon (Blue)		
	PPR-H ₂		221-35999-02	✓	✓	✓	✓	①②③④⑤⑥⑦	for Hydrogen (Red)		
	PPR-He		221-35999-03	✓	✓	✓	✓	①②③④⑤⑥⑦	for Helium (Yellow)		
Gas Supply Pipe		See article	△	△	△	△		①②③④⑤⑥⑦			
Economic Pressure Regulator	for Nitrogen and Argon		042-41099-01		△		△	①②③④⑤⑥	Grey		
	for Hydrogen		042-41099-02		△		△	①②③④⑤⑥	Red		
	for Helium		042-41099-03		△		△	①②③④⑤⑥	Green		
Super-Clean Gas Filter		See article	✓	✓	✓	✓		①②③④⑤⑥⑦			
Split Filter	for SPL-2030		221-77580-42	✓					28		
	See article		221-42559-92		✓	✓		⑥⑦			
Oxygen Trap		221-46985-91	✓	✓	✓	✓		①②③④⑤⑥⑦			
Syringe	Syringe		See article	Please refer to the article.						29-33	
	Micro Solid Phase Extraction Syringe		MEPS™	See article	Please refer to the article.					Available for both manual use and autosampler	34
Parts for Tubing	Shimadzu M Type Joint		See article	△	△	△	△	①②③④⑤⑥⑦			
	Swagelok Adapter		221-25975-92	△	△	△	△	①②③④⑤⑥⑦			
	Thread Adapter	MM-PT1/4		201-34675	△	△	△	△	①②③④⑤⑥⑦		
		MM-PT1/8		221-03106	△	△	△	△	①②③④⑤⑥⑦		
	Needle Valve		221-57298	△	△	△	△	①②③④⑤⑥⑦			
Syringe for Cleaning		221-35641-91	△	△	△	△	①②③④⑤⑥⑦				

New Functionality in the Nexis GC-2030

Making Routine Analysis Work More Convenient

ClickTek Nut Quick-Connect Injection Port (included standard with SPL-2030 and WBI-2030 units)

Replace Sample Injection Unit Inserts Without Using Tools

The sample injection port can be opened or closed without tools by simply twisting a lever with fingers. The nut minimizes the trouble involved in replacing inserts.

(See page 24.)



ClickTek Nut

ClickTek Connector Connects Columns in a Single Step (optional for sample injection units and detectors)

Attach or Remove Columns Without Using Tools

With ClickTek connectors, columns can now be attached by hand. The click sensation felt when column attachment is complete provides a more reliable connection and ensures a better seal even under high-temperature and high-pressure conditions.

(See page 24.)

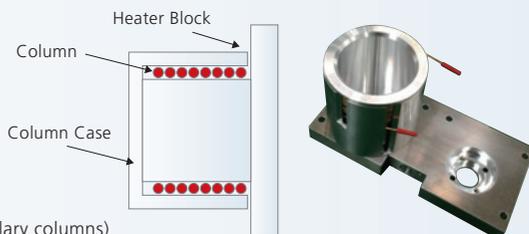


ClickTek Connector

Valve Warming Box (optional)

For Flow Line Switching Valves and GC Systems with an Added Thermostatic Chamber

By installing a micro-column, instead of a valve, it can also be used as a sub-oven.



Column Case
(For micro-packed and capillary columns)

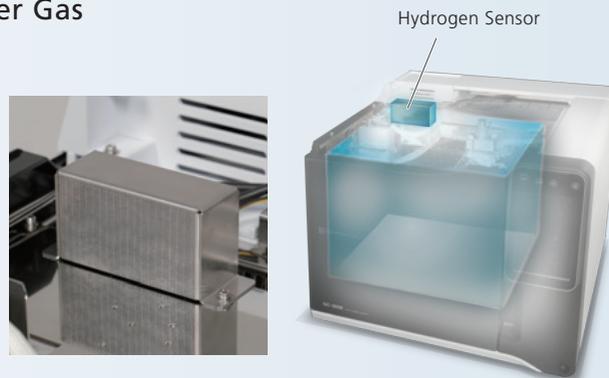




Hydrogen Sensor (optional) P/N 221-78910-41

Safety Measure for Using Hydrogen as Carrier Gas

The Nexis GC-2030 includes a built-in hydrogen sensor. It not only maintains a safe standby mode by early detection of any potential leaks, it also shuts OFF the main power supply to prevent accidents in the event the hydrogen leakage rate increases. The main unit also includes an automatic carrier gas leak check function, which is very helpful when using hydrogen as a carrier gas.



Oven Light Unit (optional) P/N 221-78939-41

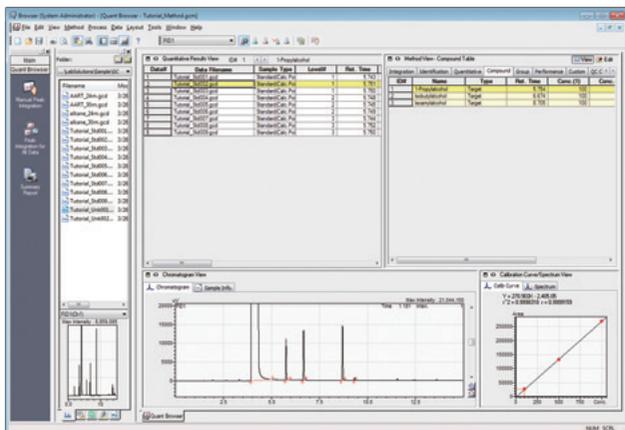
Facilitates Process by Illuminating the Area Near Hands When Attaching or Removing Columns

A light installed inside the oven illuminates the workspace to reduce the burden on operators when attaching columns.



Workstation/Data Processor

Integrated Workstation LabSolutions



Applicable system: Nexis GC-2030 *1, GC-2010/2010 Plus, GC-2025 *2, GC-2014, GC-14B *3

- * Not applicable for PONAsolution, MDGCSolution. Please use GCsolution instead.
- *1 Ver. 5.6 or later and ver. 6.2 or later are capable of controlling Nexis GC-2030.
- *2 Ver. 5.51 or later and ver. 6.10 or later are capable of controlling GC-2025.
- *3 CBM-102 (P/N: 223-04860-31) is required for controlling GC-14B.

LabSolutions is a next-generation workstation that not only integrates the controls of GC and LC systems but offers improved network functionality. It enables performing all analysis steps automatically from startup to shut down. Log browser has also been improved to help you confirm various analysis results. In addition, a PDF output function is added as a standard feature, which helps promote a paperless laboratory. LabSolutions enables higher operability and productivity.

Optional Software for Workstation

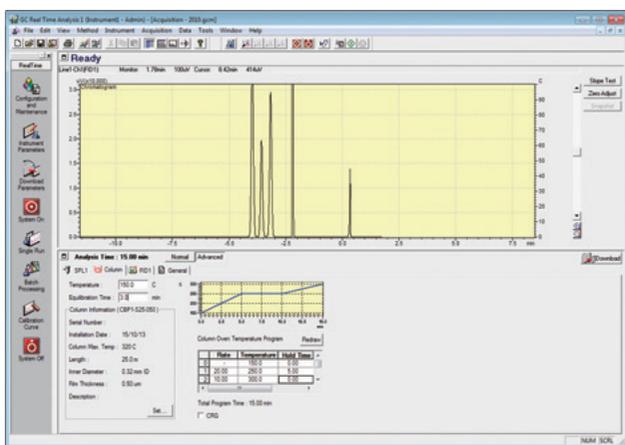
Description	P/N
Simulated Distillation GC Software	223-61510-92

Enables distillation GC analysis with LabSolutions. Suitable for ASTM, ISO, EN, JIS standards. Not applicable for GCsolution.

Description	P/N
HS-20 Support Kit	223-07736-92
HS-10 Support Kit	223-07740-92

Enables controlling Headspace Sampler HS-20 or HS-10 with LabSolutions. Not applicable for GCsolution.

GC Workstation GCsolution ver. 2



Applicable system: GC-2010/2010 Plus *1, GC-2014, GC-2025 *2, GC-17A *3, GC-1700 *3, GC-14A/B *3,4

- *1 Ver. 2.32 or later is capable of controlling GC-2010 Plus.
- *2 Ver. 2.40 or later is capable of controlling GC-2025.
- *3 CBM-102 (P/N: 223-04860-31) is required for controlling or conducting data processing of GC-17A, GC-1700, GC-14A/B and other analog data.
- *4 Control of some GC-14A functions is restricted.

Achieving high performance and productivity, GCsolution ver. 2 adopts the featured Assistant Bar and Data Explorer from the LabSolutions Series for easier use. GCsolution also enables an upgraded operating environment for the quality control function in environmental measurement as well as a GLP/GMP support function for pharmaceutical analysis. Applicable for controlling and conducting data processing for four independent GC Systems. Not compatible with the Nexis GC-2030.

Optional Software for Workstation

Description	P/N
PONAsolution	221-57833-92

Enables PONA analysis software with GCsolution. Requires fixed table for analysis targets. Not applicable for LabSolutions.

Chromatography Data Acquisition Module CBM-201m

Description	P/N
CBM-201m Chromatography Data Acquisition Module	221-80265-58

The CBM-201m is a compact data acquisition module that is designed specifically for use with LabSolutions. It converts up to two analog chromatogram signals output from LC/GC systems into digital signals and sends them to LabSolutions. (It does not support wide-range outputs from the GC-17A or other models.)

It supports connection to a computer via either a USB or Ethernet LAN connection. That means an Ethernet cable can be used to connect the computer and LC/GC system when they are far apart, whereas a USB connection can be used to minimize installation space for a standalone computer environment with module power supplied via the USB cable.

Communication Bus Module CBM-102

Description	P/N	Remarks
CBM-102 Communication Bus Module	223-04860-32	115V
	223-04860-38	230V, Non RoHS only

By adding a CBM-102 communication bus module, GCsolution can be used to control GC-17A or GC-14A/B units or for data acquisition (or only GC-14A/B units using LabSolutions GC). However, a GC-14B optical link unit (221-42171-91) is required for connecting GC-14A/B units.

By adding a 3-channel optical link interface (223-03727-91), settings can also be specified for AOC-20i/s units installed in GC-17A or GC-14A/B systems.

Optional Board for CBM-102

Description	P/N
2-channel Board	223-04202-41
3-channel Opt-link Transmission Interface	223-03727-91

Optional Board for LabSolutions, GCsolution

Description	P/N
2-channel COM Port Extension Board (RSA-PCI3R)	088-50877-79
4-channel COM Port Extension Board (RSA-PCI3/P4R)	088-50877-78

Direct-connection Signal Cord

Connect GC system and Chromatopac without a relay. (Length: 2 m)

Applicable GC		P/N
Nexis GC-2030, GC-2010/2010 Plus, GC-2014, GC-2025	Wide *1	221-47251-41
	Linear *2	221-47251-42
GC-8A		221-26918-91
GC-14A/B, GC-17A (Linear range)		221-26917-91
GC-17A Wide Range FID		221-41124-91

*1 This Analog cable "WIDE" is a standard accessory for Nexis GC-2030, GC-2010 Plus, GC-2010, GC-2014 and GC-2025. Please set the detector signal output of the GC to "Linear", when this cable is connected to a Chromatopac, which is not applicable for wide range.

*2 This cord is used when the applicable GC system is connected to CBM-102 or C-R7A plus or C-R8A, and the detector signal output is set to Linear.

External Device Controller PRG

Description	P/N	Remarks
PRG-2030	221-78880-41	If controlling 24 V parts
PRG-2010 Plus	221-49387-44	If using a PRG box
PRG BOX (for 115V)	221-49388-41	Required to be added to control the device driven by 115V
PRG BOX (for 230V)	221-49388-44	Required to be added to control the device driven by 200V

A PRG-2030/PRG-2010 Plus controller is required for controlling valves, pumps, and other devices. Parts that function on 24 V DC power can be controlled from the Nexis GC-2030 using the PRG-2030 controller or from GC-2010 Plus or GC-2014 systems using the PRG-2010 Plus controller. A separate PRG box must be added to control parts that function on 100 V or 230 V AC power voltage. In addition to being controlled from the main GC unit, parts can also be controlled from LabSolutions or GCsolution software or a Chromatopac (C-R8A or C-R7A Plus) data processor connected to the GC unit by an RS-232C cable.



PRG BOX

Chromatopac C-R8A (SD card version)

P/N	Remarks
221-80450-32	100V and 115V
221-80450-38	230V



The easy-to-use C-R8A includes various peak processing functions and quantitative calculations, making it suitable for routine work in quality control laboratories. C-R8A has an automated validation function to support GLP/GMP/ISO requirements, and is equipped with a high-speed RS-232C port (19,200 bps) for a network system using CLASS-Agent or Chromatopac manager software programs. One formatted SD card is included.

(Cat. No. C191-E001)

Optional Board

For C-R8A, C-R7A plus

Description	P/N
2-channel Board	223-04202-41
Transmission Interface	223-02983-91

For C-R8A

Description	P/N
Formatted SD Card	221-80503-91

For C-R7A plus

Description	P/N
Printer Cable, 2m	670-10231-03

For C-R6A

Description	P/N
3-channel Opt-link Transmission Interface	223-03727-91

Expansion Case (for C-R8A)

P/N	
	223-04592-91

C-R8A has two slots as standard. This Expansion Case is required if more than three optional boards are installed.

Chart Paper

For C-R8A

Description	P/N
Thermal Chart Paper (10 rolls)	223-04230-81
Anti-fade Thermal Chart Paper (10 rolls)	223-04231-81
Z-fold Thermal Chart Paper (1 set)	223-04232
Z-fold, Anti-fade Thermal Chart Paper (1 set)	223-04233

For C-R6A

Description	P/N
Thermal Chart Paper (20 rolls)	221-25412-84
Anti-fade Thermal Chart Paper (10 rolls)	223-04231-81

For C-R5A

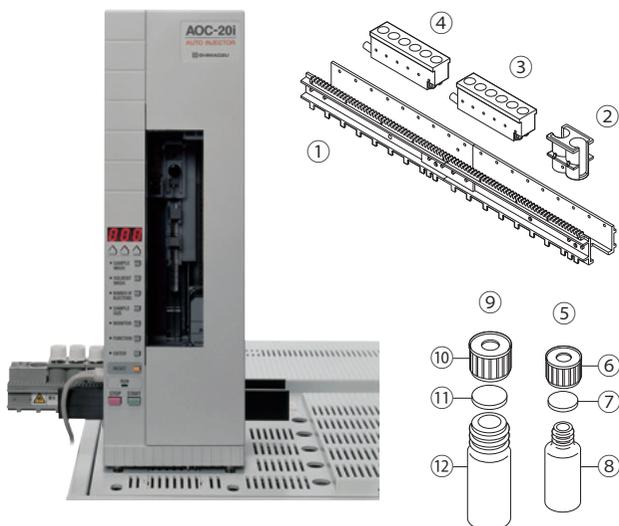
Description	P/N
Thermal Chart Paper (10 rolls)	223-02037-82
Anti-fade Thermal Chart Paper (10 rolls)	223-04300-81

Direct-connection Signal Cord

This enables a gas chromatograph to be linked directly to a Chromatopac data processor without using a relay terminal. (See page 9.)

Sampling Device

Auto Injector AOC-20i (Plus)



- Compact, lightweight and easy to install.
- Newly designed needle guide provides high injection reliability.
- Various functions such as solvent flush, internal standard simultaneous injection, and large-volume sampling make it capable of handling difference injection requirements.
- Sampling position can be changed, which makes independent sampling in a dual-tower system possible.
- Both 1.5mL and 4mL samples vials can be used.

Note 1: Following items are required if AOC-20i is installed to GC-14A/B, 17A, 18A

- GC-14A/B installation parts (P/N: 221-44549-91)
- GC-17A, 18A installation parts (P/N: 221-44548-91)

Note 2: Following kits are required if AOC-20i for GC-14A/B, 17A, 18A is installed to Nexis GC-2030, GC-2010/2010 Plus, GC-2014 and GC-2025.

- AOC-20i installation kit for GC-2010/2010 Plus (P/N: 221-48545-91)
- AOC-20i installation kit for GC-2014 (P/N: 221-48545-92)
- AOC-20i installation kit for GC-2025 (P/N: 221-48545-93)
- AOC-20i installation kit for Nexis GC-2030 (P/N: 221-44548-93)

Applicable GC	P/N
Nexis GC-2030 (without power supply)*	221-80970-58
GC-2010/2010 Plus (built-in power supply)	221-72315-58
GC-2014 (built-in power supply)	221-72314-58
GC-2025 (built-in power supply)	221-73957-58
GC-14A/B, 17A, 18A (outside power supply)	221-72354-48

* The first AOC-20i unit can be connected to the AOC power supply connector on the main Nexis GC-2030 unit.

Option

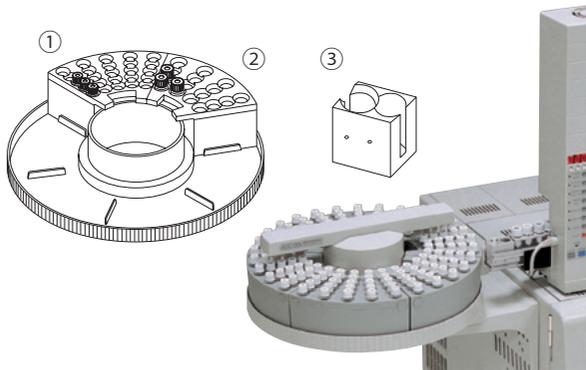
Diag. #	Description	P/N
①	Long Rack Assembly (suitable for 12 pcs of 1.5 mL Sample vials)	221-45622-91
②	4 mL Vial Rack (1 rack is included in AOC-20i)	221-32949-01
③	1.5 mL Vial Rack (1 rack is included in AOC-20i)	221-45609-92
④	1.5 mL Vial Extension Rack	221-45609-91
△	Sample Cooling Fan *1	221-44995-91
△	FPD Cooling Fan *2	221-44996-91
△	10 μ L Syringe	221-34618
△	50 μ L Syringe	221-45243
△	250 μ L Syringe	221-45244
△	Plunger Holder (5 pcs)	221-45177-91
△	Barrel Holder (5 pcs)	221-45178-91
⑤	1.5 mL Clear Vial Set (with cap and septa, 100 sets)	221-34274-91
⑥	Cap for 1.5 mL Vial (100 pcs)	221-34273-92
⑦	Septa for 1.5 mL Vial (100 pcs)	221-41239-91
⑧	1.5 mL Clear Vial Set (vial only, 100 pcs)	221-34272-92
⑨	4 mL Clear Vial Set (with cap and septa, 50 sets)	221-34269-91
⑩	Cap for 4 mL Vial (50 pcs)	221-34268-92
⑪	Septa for 4 mL Vial (50 pcs)	221-34266-92
⑫	4 mL Clear Vial Set (vial only, 50 pcs)	221-34267-92

* For detailed information on Syringes, please refer to page 29.

*1 Minimize the temperature increase of sample.

*2 This part is required when using FPD in GC-14A/B.

Auto Sampler AOC-20s (Plus)



- Up to 150 samples can be analyzed if 1.5 mL vials are used. (Up to 96 samples if 4 mL vials are used)
- Teaching and learning functions enable high transport reliability.
- Applicable with dual injection system. (Nexis GC-2030, GC-2010/2010 Plus only)

The AOC-20s Plus unit (for Nexis GC-2030 systems) includes one internal power supply (221-78740-41) for the Nexis GC-2030 system. This power supply is connected to the AOC-20s Plus unit or AOC-20i Plus unit subordinate to a dual-injection system.

The AOC-20s unit (for GC units other than the Nexis GC-2030) does not include an internal power supply.

AOC-20s units or AOC-20i units subordinate to a dual-injection system are connected to the power supply included with the AOC-20i unit.

Description	Applicable GC	P/N
AOC-20s Plus	Nexis GC-2030	221-80975-58
AOC-20s	for GC units other than the Nexis GC-2030	221-72300-58

Option

Diag. #	Description	P/N
①	1.5 mL Vial Rack (6 racks are included in AOC-20s)	221-44709-91
/	1.5 mL Vial Cooling/Heat insulating Rack (5 pcs, with tube 6 m)	221-44998-91
/	1.5 mL Vial Holder for Sampler (1 rack is included in AOC-20s)	221-45181
②	4 mL Vial Rack Assembly (rack 6 pcs, 4 mL vial holder 1 pc, 4 mL vial with cap and septa 100 sets)	221-44878-91
/	4 mL Vial Rack	221-44710-91
/	4 mL Vial Cooling/Heat insulating Rack (5 pcs, with tube 6 m)	221-44999-91
/	4 mL Vial Rack for Solvent/Waste Liquid (2 racks are included in AOC-20s)	221-32949-01
③	4 mL Vial Holder for Sampler	221-45182

* For detailed information on Syringes, please refer to page 29.

Headspace Sampler HS-20 Series

Description	Applicable GC	P/N	Remarks
HS-20	Nexis GC-2030	225-21900-42	115V
		225-21900-58	230V
HS-20 Trap	GC-2010/2010 Plus	225-22000-42	115V
		225-22000-58	230V
HS-20 LT	Nexis GC-2030 GC-2010/2010 Plus GC-2014 *	225-22050-42	115V
		225-22050-58	230V

* Not applicable for GC-2014s.

HS-20 and HS-20 LT (long transfer line) feature a sample loop injection method, while the HS-20 Trap is capable of both sample and trap injection methods. HS-20 Series also enables the analysis of high-boiling compounds due to an oven configurable up to 300 °C and a simple, inert sample line.

Note 1: Some limitations apply to sample injection unit and detector combinations that can be installed at the same time.

Note 2: For the control software, please refer to page 8.

(Cat. No. C146-E209)



HS-20 + Nexis GC-2030

Vials and Tools

Diag. #	Description	P/N
①	20 mL Head Space Clear Vial (100 pcs)	225-23140-21
②	10 mL Head Space Clear Vial (100 pcs)	225-23140-11
	Pressure Release Crimp Cap with Silicone/PTFE Septa to 200°C (100 pcs)	223-57730-13
	Pressure Release Crimp Cap with Butyl/PTFE Septa to 120°C (100 pcs)	223-57730-16
	Septa for High Temperature to 300°C (100 pcs)	225-11078-01
	Crimp Cap for High Temperature to 300°C (500 pcs)	225-11078-02
	Crimper	223-57730-51
	Decapper	223-57730-52
	Vial Rack for 25 vials	223-57730-61

Headspace Sampler HS-10

Description	Applicable GC	P/N	Remarks
HS-10	Nexis GC-2030 GC-2010 Plus GC-2014	221-76862-12	100-120V, Transfer line 1.4 m (English)
		221-76862-13	220-240V, Transfer line 1.4 m (English)
		221-76862-14	220-240V, Transfer line 1.4 m (Chinese)

HS-10 headspace sampler is highly cost efficient, yet equipped with advanced features such as a mixing function and the ability to heat-ahead the sample vials waiting for analysis.

This instrument is the perfect platform for the analysis of residual pharmaceutical solvents and trace VOCs in wastewater.

* Vials and tools of HS-20 series are common to HS-10.

(Cat. No. C180-E081)



HS-10 + Nexis GC-2030

Valve / Valve Applied Device

Gas Sampler

Description	P/N
MGs-2030	221-78990-41
MGs-2010	221-75363-41

MGs-2010 is the manual gas sampler for Nexis GC-2030/GC-2010 Plus. Its purge function, which can reduce the effect from ambient air, avoids noise. A manual flow controller for purge is included as a standard accessory. MGs-2010 is connected between the injection port and AFC, which also enables sampling gas by a syringe. Peaks may become wider due to a low supply gas flow rate (total flow rate). Therefore, it should be operated carefully when using the low split method and total volume injection method.

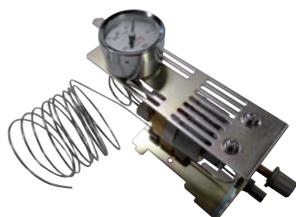
Purge Gas Flow Rate: approx. 40 mL/min

Sample Loop: 1 mL (included in MGs-2010)

Change of loop volume and heat insulation are available.



MGs-2010 Valve



Manual Flow Controller for Purge

Description	P/N
MGs-4	221-42574-02
MGs-5	221-42576

These gas samplers are used to introduce gas samples through a manual switching 6-port valve, under ambient temperature conditions. The sample volume to be introduced is selectable in three steps of 1, 2, and 5 milliliters by valve operation (MGs-5) or by changing the sample loops (MGs-4).

The following installation kit is required.

Description	Applicable GC	P/N
For MGs-4	GC-2010/2010 Plus, GC-2014, GC-17A, GC-14B	221-42868-91
	GC-8A	201-38304
For MGs-5	GC-2010/2010 Plus, GC-2014, GC-17A, GC-14B, GC-8A	221-42585-41

Note: When installing MGs-5 to a GC-8A, note that the top of the GGS-5 is 5 cm higher than the top of the GC.

Cryogenic Work Attachment

When a GC column must be kept below the ambient temperature, some coolant (liquid CO₂ for down to -50°C and liquid N₂ for lower temperatures) is injected into the column oven. The CRG Series keeps the column oven temperature at the desired point by controlling the injection rate of the coolant. When using liquid CO₂, a siphon gas cylinder is required.

Note: The temperature controller of CRG is built in Nexis GC-2030, GC-2010/2010 Plus, 2014, 2025, 17A ver. 2/3 and 18A.

Cryogenic Valve Unit

Description	Coolant	Applicable GC	P/N	Remarks
CRG-2030, CO ₂		Nexis GC-2030	221-78900-41	
CRG-2010, CO ₂	Liquid CO ₂	GC-2010/2010 Plus	221-48703-42	115V
		GC-2014	221-48703-48	230V
CRG-2025, CO ₂		GC-2025	221-73920-42	115V
			221-73920-44	230V
CRG-2010, LN ₂	Liquid N ₂	GC-2010/2010 Plus	221-49588-42	115V
			GC-2014	221-49588-48
CRG Solenoid Valve, LN ₂		GC-17A ver. 2/3	221-43847-92	115V
			GC-18A	221-43847-38

Cryogenic Work Attachment

Description	Applicable GC	P/N	Remarks
CRG-8	GC-8A	221-24660-92	100V

Detector

Flame Ionization Detector (FID)

Description	Applicable GC	P/N	Remarks
FID-2030 (with digital pressure controller)	Nexis GC-2030	221-77200-41	100-115V
		221-77200-44	230V
FID-2010 Plus (with digital pressure controller)	GC-2010/2010 Plus	221-73345-42	115V
		221-73345-48	230V
FID-2014 Single (for hydrogen, air, make-up, with manual flow controller)	GC-2014	221-75030-42	115V
		221-75030-44	230V

* For dual flow-rate packed column analyses, please choose GC-2014AF or GC-2014ATF, which feature a built-in FID.

The flame ionization detector is the most popular detector for gas chromatography because it is highly sensitive to almost all organic compounds. Meanwhile, being little influenced by changes in temperature and flow rate ensures a high signal-to-noise ratio and wide dynamic range.



Note: Hydrogen and supply air are necessary for FID. Please refer to page 26 for details.

Specifications

Electrode	Cylindrical
Electrode Voltage	±200V
Dynamic Range	10 ⁷
Minimum Detected Quantity	Nexis GC-2030: 1.2pgC/s GC-2010/2010 Plus: 1.5pgC/s GC-2014: 3pgC/s
Maximum Operating Temp.	Nexis GC-2030/ GC-2010 Plus/GC-2010: 450°C GC-2014: 400°C
Nozzle	Made of Quartz

Note: During high-sensitivity analysis, it is recommended to use high-purity gas (hydrocarbon less than 1 ppm). In addition, pressure regulators suitable for high-sensitivity analysis are required.

Replacement Parts

Diag. #	Description	P/N
①	Nozzle for Nexis GC-2030 (0.3 dia., 1 pc is included in above FID)	221-75597-03
	Nozzle for Nexis GC-2030 (0.8 dia., for water analysis) *1	221-75597-08
②	Nozzle for FID-2010/2010 Plus/2025 (0.3 dia., 1 pc is included in above FID)	221-48258-91
	Nozzle for FID-2010/2010 Plus/2025 (0.8 dia., for water analysis) *1	221-49373-91
③	Nozzle for FID-2014 (0.5 dia., for packed column, 1 pc is included in above FID)	221-70162-95
	Nozzle for FID-2014 (0.3 dia., for capillary column)	221-70162-93
	Nozzle for FID-2014 (0.8 dia., for water analysis) *1	221-70162-94
	Nozzle for FID-2014 (0.5 dia., for capillary column) *2	221-70162-92
	Hex Nut Screwdriver	670-18800

*1 Used for the analysis of aqueous solution, etc. if the flame easily goes out.

*2 Included in additional FID-2014 Single, SPL-2014 and WBI-2014 as a standard accessory.

Supply Gas Shut-off Solenoid Valve Unit

Applicable GC	P/N
GC-2014	221-70782-41



This Solenoid Valve Unit is connected to the detector's supply gas (hydrogen, air). It not only can shut off the supply gas according to instrument power supply or system ON/OFF operation, but also enables automatic start up and shutdown after analysis ends. Therefore, the supply gas can be shut off during a power outage to ensure a safer laboratory. Flame status can also be monitored in GC-2014.

Note: One unit can be connected to two pipes. It is not applicable for FTD. One of left-hand thread (for hydrogen) and one pc of right-hand thread are required.

Flame Monitor FLM-2

Applicable GC	P/N	Remarks
GC-2010/2010 Plus, GC-2014, GC-17A ver. 2/3	221-41590-91	100V
GC-8A, GC-14A/B	221-41845-97	

If the FID flame should die out during operation, unburnt hydrogen will flow out of the detector cell, which is quite dangerous. With this device, the hydrogen flow will be automatically turned off by the solenoid valve, if the flame dies out.

Note 1: In GC-2010/2010 Plus/2025, detector supply gas is controlled by APC.

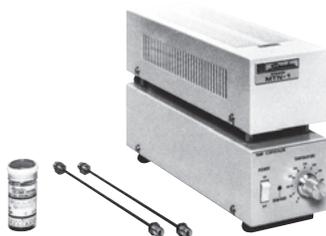
Therefore, the flame can be monitored and shut off from the GC system.

Note 2: In the case of dual FID in GC-2014, additional sensor assembly is required (P/N: 221-42546-91).

Note 3: Not compatible with the Nexis GC-2030.

Methanizer MTN-1 (for packed column only)

P/N	221-41820-92
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MTN-1 reduces CO and CO₂ into CH₄ using a nickel catalyzer. Adding this device between a column and FID allows CO and CO₂ to be detected at a high sensitivity through simple operation. It enables detecting CO and CO₂ below 10ppm, which is impossible with a TCD.

Nickel catalyzer (5mL) is included.

Note: Nickel catalysts are deactivated by oxygen. Therefore, when analyzing samples containing oxygen, an additional system is required to prevent the introduction of oxygen to the methanizer. Please contact your local Shimadzu representative for details.

Flame Thermionic Detector (FTD)

Description	Applicable GC	P/N	Remarks
FTD-2030 (with digital pressure controller)	Nexis GC-2030	221-77800-41	100-115V
		221-77800-48	230V
FTD-2010 Plus (with digital pressure controller)	GC-2010/2010 Plus	221-73332-42	115V
		221-73332-48	230V
FTD-2014 (with manual flow controller)	GC-2014	221-75033-42	115V
		221-75033-44	230V
FTD-2014C (with manual flow controller)	GC-2014 (capillary column only)	221-75034-42	115V
		221-75034-44	230V

Note: FTD requires hydrogen and air as supply gas. Supply air should be from a high-purity air cylinder. It is not recommended to use air from a compressor.

These detectors can be used for analyzing organic phosphorus compounds or organic nitrogen compounds, such as residual pesticides.

Specifications

Minimum Detected Quantity	(For a Nexis GC-2030 system) N: 0.1 pg N/sec (azobenzene) P: 0.01 pg P/sec (malathion) (For a GC-2010 Plus system) N: 0.1 pg N/sec (azobenzene) P: 0.01 pg P/sec (malathion) (For a GC-2010 system) N: 0.3 pg N/sec (azobenzene) P: 0.03 pg P/sec (malathion) (For a GC-2014 system) N: 0.4 pg N/sec (azobenzene) P: 0.05 pg P/sec (malathion) Same for both FTD-2014 and FTD-2014C
Maximum Operating Temp.	Nexis GC-2030/ GC-2010 Plus/GC-2010: 450°C GC-2014: 400°C

Replacement Parts

Diag. #	Description	P/N
	FTD Collector Regeneration Kit *	221-49079-91
①	FTD-2030/2010 Plus/2014C Collector	221-71513-91
②	FTD-2010 Collector	221-45586-91
	FTD-2014 Collector (standard type)	221-18704-91
	FTD-2014 Collector (special type for pesticide analysis)	221-42512-91
	Hex Nut Screwdriver	670-18800
	Nozzle for FTD-2010/2010 Plus/2014C (0.3 dia., standard)	221-48258-91
	Nozzle for FTD-2014 (0.5 dia., for packed columns)	221-70162-95
	Cable Packing for FTD-2014 (fluoropolymer sheet)	221-70662

* This kit allows the reuse of the FTD-2030/2010/2010 Plus/2014C collector by replenishing the alkali-ion source.

FTD-2030/2010/2010 Plus/2014C each includes 1 pc of collector as a standard accessory.

	Shape of Collector
Present Model FTD-2030 FTD-2010 Plus FTD-2014C	①
Previous Model FTD-2010 FTD-2014C Initial type	②

Barrier Discharge Ionization Detector (BID)

Description	Applicable GC	P/N	Remarks
BID-2030	Nexis GC-2030	221-77700-41	115V
		221-77700-44	230V
BID-2010 Plus	GC-2010 Plus	221-76000-42	115V
		221-76000-44	230V

BID enables detecting every compound except Ne (neon) and He, which is plasma gas, with high sensitivity (ppm). Therefore, a BID detector can analyze CO, CO₂ and light hydrocarbons simultaneously with high sensitivity, while these mixed gas samples require multiple detectors using conventional analytical methods.

Specifications

Minimum Detected Quantity	Nexis GC-2030: 0.8 pgC/s (dodecane, discharge gas flow rate 50 mL/min) GC-2010Plus: 1 pgC/s (dodecane, discharge gas flow rate 50 mL/min)
Dynamic Range	10 ⁵
Maximum Operating Temp.	350°C
Applicable Carrier Gas	He (above 99.9999vol.%)

Flame Photometric Detector (FPD)

Description	Applicable GC	P/N	Remarks
FPD-2030 (with digital pressure controller)	Nexis GC-2030	221-77600-41	100-115V
		221-77600-48	230V
FPD-2010 Plus (with digital pressure controller)	GC-2010 Plus	221-73334-42	115V
		221-73334-48	230V
FPD-2010 (with digital pressure controller)	GC-2010	221-47734-92	115V
		221-47734-38	230V
FPD-2014 (with manual flow controller)	GC-2014	221-75031-42	115V
		221-75031-44	230V

The characteristic light emitted in the combustion of sulfur or phosphorus compounds is selected with an optical filter and detected by a photomultiplier to permit selective detection. FPDs are now extensively used for determination of malodorous compounds such as hydrogen sulfide and methyl sulfide, and determination of residual phosphoric pesticides.

Interference Filters

Use an appropriate filter (sold separately) for your detection target. Three types, for detecting sulfur, phosphorus, and tin, are available.

For Nexis GC-2030

Description	P/N
S filter for Sulfur Detection (Blue)	221-80888-01
P filter for Phosphorus Detection (Yellow)	221-80888-02
Sn filter for Tin Detection (Orange)	221-80888-03

For GC-2010 and GC-2014

Description	P/N
S filter for Sulfur Detection (Blue)	221-46310-01
P filter for Phosphorus Detection (Yellow)	221-46310-02
Sn filter for Tin Detection (Orange)	221-46310-03



S filter



P filter



Sn filter

Specifications

Minimum Detected Quantity	Nexis GC-2030: S... 2×10^{-12} gS/s (dodecane thiol) P... 45×10^{-15} gP/s (tri-butyl phosphate) GC-2010 Plus: S... 2.5×10^{-12} gS/s (dodecane thiol) P... 55×10^{-15} gP/s (tri-butyl phosphate) GC-2010: S... 4×10^{-12} gS/s (dodecane thiol) P... 2×10^{-13} gP/s (tri-butyl phosphate) GC-2014: S... 8×10^{-12} gS/s (dodecane thiol) P... 5×10^{-13} gP/s (tri-butyl phosphate)
Power Supply	-700V stabilized
Maximum Operating Temp.	350°C

For GC-2010 Plus

Description	P/N
S filter for Sulfur Detection (Blue)	221-73354-01
P filter for Phosphorus Detection (Yellow)	221-73354-02
Sn filter for Tin Detection (Orange)	221-73354-03

For GC-14A/B, GC-17A

Description	P/N
S filter for Sulfur Detection (Blue)	221-00892-01
P filter for Phosphorus Detection (Yellow)	221-00897-01
Sn filter for Tin Detection (Orange)	221-27398-91

Note 1: Hydrogen and supply air are necessary for FPD. Please refer to page 26 for details.

Note 2: During high-sensitivity analysis, it is recommended to use high-purity gas (hydrocarbon less than 1 ppm). In addition, pressure regulators suitable for high-sensitivity analysis are required.

Photomultiplier Purge Kit

The service life of expensive photomultipliers can be extended by reducing the amount of helium or other gases entering the photomultiplier to prevent deterioration.

The kit is useful for installing a detector that uses helium (FID or FTD) or for simultaneously installing an FPD.

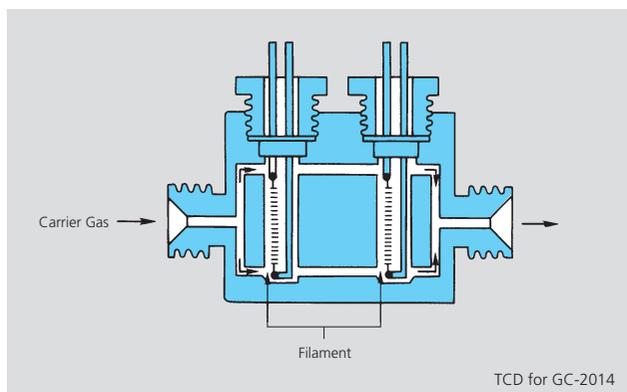
Note: A photomultiplier purge kit is not included standard with FPD-2030 detectors.

Applicable GC	P/N
Nexis GC-2030	221-81010-41
GC-2010 Plus GC-2010	221-72652-43
GC-2014	221-72652-44

Thermal Conductivity Detector (TCD)

Order TCD detectors factory-installed in the main GC unit. Though installing a TCD detector on-site in an existing GC unit is not impossible, the noise level and detection sensitivity performance indicated in specifications cannot be guaranteed. Contact your local Shimadzu representative for details.

Based on its simple construction and operation, in principle this general purpose detector should be able to detect all substances with a thermal conductivity that is different than the carrier gas.



TCD must be pre-installed in a Shimadzu factory. Otherwise, the specified noise level and sensitivity cannot be guaranteed.

Capillary Adapter for TCD

Applicable GC	P/N
GC-2014, GC-14A/B	221-34012-91

When a capillary column (including wide-bore type) is connected to a TCD, it is necessary to use this pipe to supply make-up gas. (The same type of gas used for carrier gas.) Make-up gas supply line parts are not included.



Preamplifier AMP-7B

P/N	221-41816-91
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AMP-7B enhances the intensity of the TCD signal by a factor of ten. It is equipped with two output terminals, for recorder (0 - 1 mV) and for data processor (0 - 1V). It provides a longer life for the filaments because the filament current can be halved, while maintaining the sensitivity, and enables detection of oxygen impurities in nitrogen at the 0.05 ppm level.

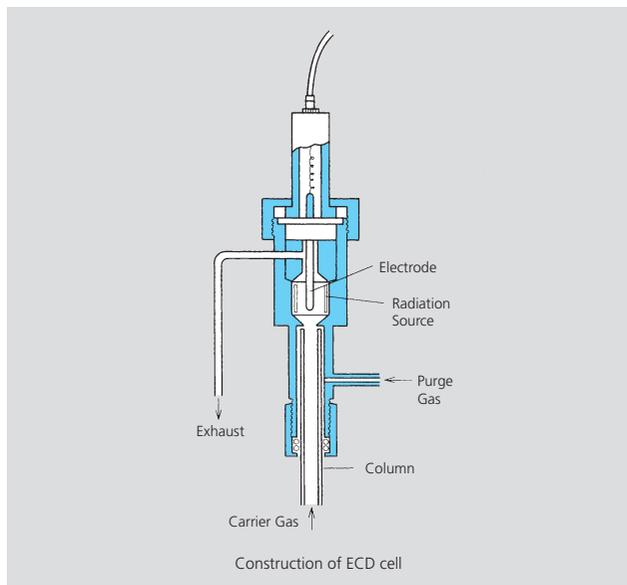
Note: Not required for Nexis GC-2030, GC-2010/2010 Plus and GC-2014.



Electron Capture Detector (ECD)

ECD provides extremely high selective sensitivity to halogen and nitro compounds by using a radioisotope, especially sensitive to chlorinated compounds. It enables reliable detection of chlorinated compounds at the picogram quantity level, such as the trace analysis of chlorinated pesticide residue.

To ensure a stable baseline, supply gas (especially nitrogen) must be free of oxygen. Please refer to page 28 for the details of oxygen trap.



Specifications

Type	Constant current, pulse frequency control
Radiation Source	⁶³ Ni 370MBq
Electric Current	Nexis GC-2030, GC-2010 Plus: 0.00 - 3.50 nA GC-2010/2014: 0.00 - 2.00 nA GC-8A: 0.5, 1, 2 nA
Dynamic Range	10 ⁴
Minimum Detected Quantity	Nexis GC-2030: 4.0 fg/s (γ-BHC) GC-2010 Plus (ECD-2010 Exceed): 4.0 fg/s (γ-BHC) GC-2010 Plus (ECD-2010 Plus): 4.4 fg/s (γ-BHC) GC-2010: 8 fg/s (γ-BHC) GC-2014: 100 fg/s (γ-BHC) GC-8A: 200 fg/s (γ-BHC)
Maximum Operating Temp.	350°C

Note: Since ECD uses a radioisotope as the radiation source, please check all local related laws and regulations in advance.

Description	Applicable GC	P/N	Cell
ECD-2030	Nexis GC-2030	221-77540-42	221-77510-41 (115V)
			221-77510-48 (230V)
ECD-2010 Exceed	GC-2010 Plus	221-77550-42	221-77510-41 (115V)
			221-77510-48 (230V)
ECD-2010 Plus	GC-2010/2010 Plus	221-47733-42	221-72002-91 (115V)
			221-72002-38 (230V)
ECD-2014 (115V)	GC-2014	221-75032-42	221-72001-91
ECD-2014 (230V)		221-75032-44	
-	GC-8A	-	221-72003-91

* ECD controller and its cell are sold separately for reliable control of the radioisotope.

ECD bypass kit: This option is used to continuously pump gas through the ECD cell even when the power supply is OFF, so that the baseline stabilizes more quickly after switching the power ON.

Order 221-49664-42 for ECD-2010 Exceed or 221-49664-41 for ECD-2010 Plus/ECD-2010. The ECD-2030 includes a bypass kit as standard equipment.

Make-up Gas Supply Line Parts

When an ECD is used in capillary gas chromatography, when Helium is usually used as carrier gas, it is necessary to supply nitrogen as make-up gas.

Description	P/N
PPR-N ₂ Pressure Regulator	221-35999-01
Gas Supply Pipe	201-48067
Super-Clean Gas Filter Kit	227-37002-01



Sample Injection Unit

Split/Splitless Sample Injection Unit

Description	Applicable GC	P/N	Remarks
SPL-2030 (with digital flow controller)	Nexis GC-2030	221-77100-41	100-115V
		221-77100-44	230V
SPL-2010 Plus (with digital flow controller)	GC-2010 Plus	221-73040-41	115V
		221-73040-48	230V
SPL-2010 (with digital flow controller)	GC-2010	221-71040-91	115V
		221-71040-38	230V
SPL-2014 (with digital flow controller)	GC-2014	221-75046-41	115V
		221-75046-44	230V

The SPL series enables both split mode and splitless mode (Grob method), which makes it the most widely used type of sample injection for capillary gas chromatography.

The advanced flow controller (AFC) enables easy setup of the carrier gas flow rate and split ratio, time of sampling in splitless mode, carrier gas saver, high-pressure injection, etc.

Wide-Bore Injection Unit

Description	Applicable GC	P/N	Remarks
WBI-2030 (with digital flow controller)	Nexis GC-2030	221-78200-41	100-115V
		221-78200-44	230V
WBI-2010 Plus (with digital flow controller)	GC-2010/ 2010 Plus	221-73041-41	115V
		221-73041-48	230V
WBI-2014 (with digital flow controller)	GC-2014	221-75047-41	115V
		221-70047-34	230V
WBI-2014 (AMC) * (with digital flow controller - flow rate control only)	GC-2014	221-75038-41	115V
		221-70038-34	230V

* Required if the additional AFC results in more than the maximum number of units (2 units).

The WBI unit is ideal for achieving a higher resolution with capillary columns than with packed columns. The direct injection method, where the entire sample is injected using a wide-bore column with an internal diameter of 0.53mm, allows the same ease of use as packed columns while taking full advantage of the inertness of fused silica columns. In particular, this method achieves a high level of reproducibility with unstable substances that have a strong polarity, an application that is very difficult using packed columns. In addition, the sensitivity can be maintained as the sample does not split, and there are no inconsistencies in data due to differences in sampling methods.

On-column / Programmed Temperature Vaporization Injection Unit

Description	Applicable GC	P/N	Remarks
OCI-2030	Nexis GC-2030	221-78300-42	115V
		221-78300-48	230V
PTV-2030	Nexis GC-2030	221-78350-42	115V
		221-78350-48	230V
OCI/PTV-2010	GC-2010/ 2010 Plus	221-71042-41	115V
		221-71042-44	230V

* By changing the flow lines, either an OCI or PTV injection method can be used with the OCI/PTV-2010 unit.

* Not applicable for GC-2014.

With the on-column sample injection method, the sample solution is injected directly into the column and the entire sample is subjected to analysis. As a result, there is no discrimination due to differences in boiling points. It can be used for a wide range of samples with both low and high boiling points. In contrast to the method of injecting

into a high-temperature vaporizing chamber, the sample is not heated to a temperature exceeding the column temperature, making it ideal for analyzing thermally labile samples.

Maximum Temperature: 450°C (cooling is performed using a stream of a fan)
Maximum Programming Rate: 250°C/min, allowing multi-step heating.
Options:

1. Microsyringe (P/N: 221-37282-02)
Special syringe is required for OCI injection with AOC-20i.
2. Press-tight Connector (P/N: 221-38102-91)
If capillary columns with small internal diameters are used, this item is required to connect the column with a pre-column (deactivated empty capillary tube, 0.53 mmID).
3. Simple OCI Insert (P/N: 221-49381-01)
Enables injection into capillary columns with small internal diameters without using a pre-column. In addition, a standard AOC syringe can be used.

Single Packed Injection Unit

Description	P/N	Remarks
INJ2014 Single Packed Sample Injection Unit	221-75037-41	100-115V
	221-75037-44	230V

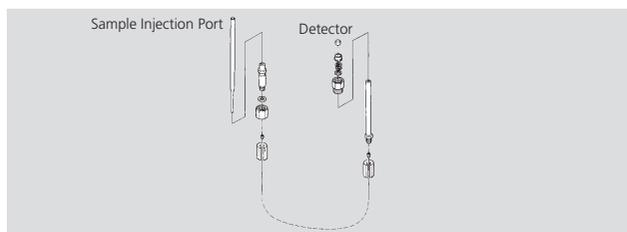
The single packed injection unit is an injection unit for single flow line type packed columns. It is used to provide a dedicated sample injection unit for a high-sensitivity detector, to eliminate the trouble of moving a dual-packed injection unit in front of the detector when a glass column is used, or for other reasons (only for GC-2014 systems).

Dual-packed injection units installed in GC-2014 system that support packed columns can also be used for added single-type detectors (such as an ECD).

ClickTek Connectors (quick-connect injection ports and columns)

A ClickTek quick-connect injection port is included standard with SPL-2030 and WBI-2030 units. They cannot be installed on other injection units. Quick-connect columns can be installed for connecting columns in Nexis GC-2030 detectors and injection units. (See page 6.)

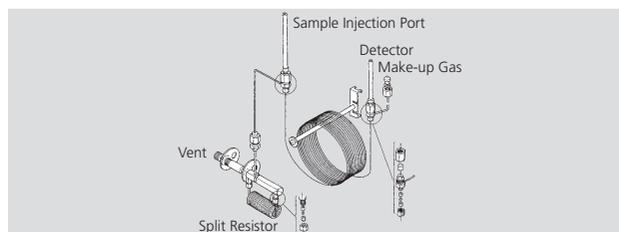
Wide-Bore Capillary Column (WBC) Attachment



Applicable GC	P/N
GC-2014, GC-8A, GC-14A/B	221-29992-91

Utilize this attachment when using a wide-bore capillary column (0.53mm ID) in the direct injection method in a packed column GC system. It includes two glass inserts (one for GC-2014, GC-14A/B and one for GC-8A), and 10 pcs. of graphite ferrules for a 0.53mm ID column. A column holder for a packed column is sold separately (P/N: 221-70200, for GC-2014). When the column is connected to a TCD, the Capillary Column Adapter (P/N: 221-34012-91, page 19) and supply gas line for make-up gas are required.

Splitter Attachment CLH-800



Applicable GC	P/N
GC-8APF	221-23743-91

CLH-800 enables using the split injection method in a GC-8A system. Three types of split ratios are available depending on the type of resistors.

Injection Port Septum

Description	P/N	Color	Features
 Premium Green Septum (50 pcs)	227-35004-01 (for Nexis GC-2030)	Green	This low-bleed septum is heat resistant (up to 350 °C injection port temperature). It helps inhibit components bleeding even during high-sensitivity analysis. Made of crack-resistant material, it offers superior durability, sealing performance, and solvent-resistance.
 Standard type (20 pcs)	201-35584	White	General-purpose septum
 LL Septum (long life type, 20 pcs)	221-48972-91	Blue	Provides significant durability improvements compared to a conventional low-bleed septum, offering both low bleed and long life. The problem of sticking to the vaporizing chamber during continuous use at high temperatures experienced with a conventional septum has also been eliminated. <ul style="list-style-type: none"> • Suitable for high-sensitivity analysis • Maximum temperature (INJ setting temperature): 450°C
 HT Septum (high temp type, 20 pcs)	221-48398-91	Brown	Using this septum alleviates the problem of reduced durability when the vaporizing chamber is used continuously at 450°C. Compared to the LL septum, the increase in bleed when used at high temperatures is kept at a lower level. The problem of sticking to the vaporizing chamber during continuous use at high temperatures experienced with a conventional septum has also been eliminated. <ul style="list-style-type: none"> • Suitable for high-sensitivity analysis at high temperatures • Maximum temperature (INJ setting temperature): 450°C
 Low-bleed Septum (25 pcs)	221-76650-01	Green	This septum is least influenced by a plasticizer. Better prevents septum coring. <ul style="list-style-type: none"> • Low-bleed, suitable for high-sensitivity analysis
 Enduro Blue Septum (50 pcs)	221-75180	Light blue	<ul style="list-style-type: none"> • Low-bleed, suitable for high-sensitivity analysis at high temperatures • Maximum temperature (INJ setting temperature): 350°C

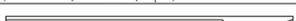
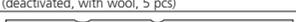
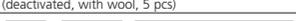
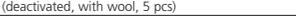
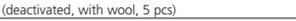
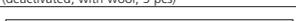
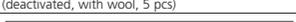
Low-bleed septum is not completely free of bleeding. The type of bleeding that occurs varies with the septum, and results in different patterns on chromatograms. In the case of high-sensitivity analysis, it is necessary to select a septum whose bleeding will not occur at a point that interferes with the peak of the target compound. Conditioning for several hours between 200°C and 250°C after extraction with hexane may help to reduce bleeding.

In the case of using a syringe for AOC, it is recommended to exchange the septum after about 100 injections. If the outside diameter of a needle of a gastight syringe is thick, it is recommended to exchange after about 50 injections.

Glass Insert for Capillary Column Analysis

Glass insert is very important to prevent the column from being contaminated by sample components. Please choose an appropriate insert according to your system model, injection port and injection method, and exchange it regularly to avoid poor reproducibility and peak shape caused by the crossover of residual samples, etc.

S: Standard; O: Option

	P/N	Specification	Nexis GC-2030	GC-2010 Plus GC-2010	GC-2014	GC-2025	GC-17A Ver.1-3 GC-1700, GC-18A		
		Injection Unit →	SPL-2030	SPL-2010 Plus SPL-2010	SPL-2014	SPL-2025	SPL-17		
Split/Splitless Injection Method	For Split	227-35007-01  (deactivated, with wool, 5 pcs)	S	O	O	O	O		
		221-41444 		O	S	S	S		
		221-41444-01 			S	O	O	O	
	For Splitless	227-35008-01  (deactivated, with wool, 5 pcs)	S	O	O	O	O		
		221-48335-01 		S	S	S	O		
		221-41544 			O	O	O	S	
		221-75192  (deactivated, 5 pcs)			O	O	O	O	
	For Split and Splitless	221-75187  (deactivated, with wool, 5 pcs)	O	O	O	O	O		
		221-75188  (deactivated, with wool, 5 pcs)	O	O	O	O	O		
		221-75189  (deactivated, with wool, 5 pcs)	O	O	O	O	O		
		221-75190  (deactivated, 5 pcs)	O	O	O	O	O		
		221-75191  (deactivated, with wool, 5 pcs)	O	O	O	O	O		
		221-75193  (deactivated, with wool, 5 pcs)	O	O	O	O	O		
		221-75194  (deactivated, 5 pcs)	O	O	O	O	O		
		221-41444-05  (deactivated, 5 pcs)	O	O	O	O	O		
		221-41544-05  (deactivated, 5 pcs)	O	O	O	O	O		
		221-75195  (deactivated, with wool, 5 pcs)	O	O	O	O	O		
		Direct Injection Method (WBI)	WBI	Injection Unit →	WBI-2030	WBI-2010 Plus WBI-2010	WBI-2014		WBI-17
				227-35008-01  (deactivated, with wool, 5 pcs)	S	O	O		O
221-41599 				O	O	*	S		
221-48335-01 				S	S	*	O		
221-75197  (deactivated, with wool, 5 pcs)				O	O	*	O		
221-41599-05  (deactivated, 5 pcs)			O	O	*	O			
WBC Attachment	221-38107 				S				
For AOC-5000 Plus	221-75196  (deactivated, 5 pcs)		O	O					

• 95 mm total length (or 139 mm for 221-38107)

* The SPL unit on the main GC unit can be used by converting it to a WBI unit using the S221-74660-41 WBI modification kit.

GC-14A/B

		P/N
SPL-14	For Split	221-37574-01
SPL-14	For Splitless	221-32544
Septum Purge Unit	For Direct	221-38151-04
WBC Attachment	For Direct	221-38107
CLH-14	Injection Port Side	221-32998-01
CLH-14	Detector Side	221-33000

Note: All are included standard.

GC-8A

		P/N
SPL-G9	For Split	221-25822-03
SPL-G9	For Splitless	221-25944-03
WBC Attachment	For Direct	221-39148
CLH-800	Injection Port Side	221-18384-04
CLH-800	Detector Side	221-18756-02

Note: All are included standard.

Glass Insert for OCI / PTV

S: Standard; O: Option

	P/N	Specification	Nexis GC-2030		GC-2010Plus/GC-2010
			OCI-2030	PTV-2030	OCI/PTV-2010
Simple On-column Injection Method	221-49381-01		O		O
	221-49381-02	 (deactivated)	O		O
PTV Injection Method	221-49300	 (quartz)		S	S
	221-74830-09	 (for AOC-MEPS™ system, deactivated, with wool, 5 pcs)		O	O

*1 GC-2010 OCI requires an additional adapter (P/N: 221-49298-91). *2 GC-17 OCI requires an additional adapter (P/N: 221-42222-91).
The part number for the PTV insert is 221-42223.

Glass Insert for Packed Column Analysis

When using a glass column, one may add a glass insert to prevent the column from accumulating non-volatile components. Please choose a proper insert according to the inner diameter of the glass column.

When using a stainless column, it is necessary to connect a glass insert to a 3.2 mmID column at the side of the injection unit. Please exchange it regularly to avoid poor reproducibility and peak shape caused by the crossover of residual sample, etc.

Note: Glass insert cannot be used in a GC-8A Series instrument when using glass columns.

S: Standard; O: Option

	P/N	Specification	GC-2014	GC-17A ver. 1-3	GC-14A/B
Injection Port Side	221-41484			O	
	221-14093	 (for 3.2 mmID column)	S		S
	221-14093-84	 (for 3.2 mmID column, 5 pcs)	O		O
	221-14094	 (for 2.6 mmID column)	S		S
	221-14094-84	 (for 2.6 mmID column, 5 pcs)	O		O

* GC for packed column analysis includes one insert for a 3.2 mmID column and one insert for a 2.6 mmID column as standard accessories.

Connecting Parts for Glass Insert

O-ring

Description	Applicable GC	P/N
Standard (viton, 10pcs)	Nexis GC-2030	227-35003-01
Standard (fluororubber, 5pcs)	GC-2010 Plus	036-11203-84
For split * (graphite, 4 pcs)	GC-2010	221-48393-91
For splitless/WBI * (graphite, 4 pcs)	GC-2014	221-47222-91
	GC-2025	
For OCI/PTV-2010 (fluororubber, 5pcs)	GC-2010	036-11201-84

Ferrule

Description	Applicable GC	P/N
For SPL-17/1700/18A (graphite)	GC-17A/1700/18A	221-46403-92
For SPL-14 (graphite)	GC-14A/B	221-75182

* For high temperatures (injection port setting temperature: 300 - 450°C)

Wool

Description	P/N
Deactivated Glass Wool (2 g) Included in GC-2010 Plus/2010/2014/2025	221-48600
Quartz Wool (2 g) Included in GC-17A/1700/18A/14A/B	201-47616-01

Shimalite Q Quartz Beads

Description	P/N
25 mL	670-10458-73

The quartz beads are typically packed in a glass insert to enhance the mixing property. They can also be used in flow restrictor tubes.

Nut and Ferrule for Capillary Column

ClickTek Parts for Nexis GC-2030

ClickTek connectors can be installed in detectors and injection units for Nexis GC-2030 systems so that columns can be attached and removed without using tools.



Diag. #	Description	Remarks	P/N
①	ClickTek connector	ClickTek column nut (1 pc)	221-77155-41
	ClickTek SPL Adapter	SPL adapter for WBI	221-77156-41
	ClickTek FID Adapter	-	221-77156-42
	ClickTek TCD Adapter	-	221-77156-43
	ClickTek BID Adapter	-	221-77156-44
	ClickTek FTD Adapter	-	221-77156-45
	ClickTek FPD Adapter	-	221-77156-46
	ClickTek Ferrule Without Hole	Blocked ferrule (6 pcs)	221-81162-00
	ClickTek Ferrule 0.43 for Narrow Bore	Narrow bore (max. 0.25 mm I.D.) ClickTek ferrule (6 pcs)	221-81162-01
	ClickTek Ferrule 0.50 for Medium Bore	Medium bore (0.32 mm I.D.) ClickTek ferrule (6 pcs)	221-81162-02
	ClickTek Ferrule 0.73 for Wide Bore	Wide bore (0.45 to 0.53 mm I.D.) ClickTek ferrule (6 pcs)	221-81162-03
	ClickTek Prefix Tool, ClickTek	Tool used to fasten ClickTek ferrules to columns	221-76547-41

Connection Parts for All GC Units

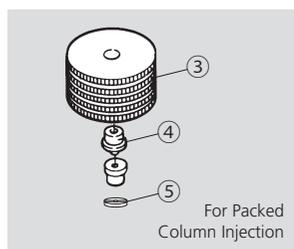
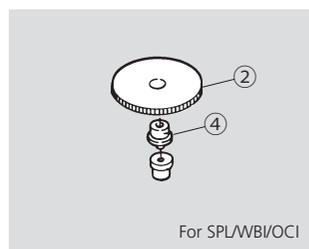


Diag. #	Description	Remarks	P/N
②	Nut with slit	5 pcs	221-32705-84
③	Nut without slit	10 pcs	221-16325-81
	Graphite Ferrule 0.5	10pcs For columns with max. O.D. of 0.5 mm	221-32126-05
	Graphite Ferrule 0.8	10pcs For columns with max. O.D. of 0.8 mm	221-32126-08

A capillary column is installed in a GC with a graphite ferrule and a nut. Two nuts are available: one with a slit and one without. The nut with a slit can be removed from the column without removing the ferrule, while the nut without a slit features a compact design and rapid temperature response. For the Nexis GC-2030/GC-2010/2010 Plus, GC-2014, and GC-2025, the nut without a slit is used at the side of the injection unit, whereas the nut with a slit is used at the side of the detector. For other GC systems, either nut can be used.

GCMS systems use Vespel brand ferrules that inhibit air intrusion via joints.

Parts of Injection Port



Diag. #	Description	Applicable GC	P/N
①	Septum Holding Nut*	Nexis GC-2030 (SPL,WBI,OCI,PTV)	221-77117-41
②	Septum Holding Nut	GC-2010 Plus (SPL)	221-72615
②	Septum Holding Nut	GC-2010 Plus (WBI/OCI), GC-2010, GC-2014, GC-2025	221-41286
③	Septum Holding Nut	GC-2014 (packed column injection)	221-70466
	Septum Holding Nut	GC-14A/B	221-13372
	Septum Holding Nut	GC-8A	221-22712-02
④	Needle Guide (2 pcs)	GC-2010/2010 Plus, GC-2014, GC-2025, GC-14A/B (AOC)	221-44823-91
	Needle Guide (2 pcs)	GC-14A/B (standard), GC-8A	221-14773
⑤	Spacer	GC-2014, GC-14A/B (packed column injection), GC-8A	221-22206

* A needle guide is attached to septa fastening nuts used in Nexis GC-2030 systems.

Installation Accessories and Supplies

Air Generator AGE-1000

P/N	Remarks
221-74500-03	115V, only for FID
221-74500-02	230V, only for FID

AGE-1000 air gas purifier can be used to remove hydrocarbons from compressor air in order to generate compressed air with hydrocarbon levels lower than Grade 1 high-purity gas (hydrocarbon concentration of 100 ppb). By reducing the hydrocarbon levels in compressed air, AGE-1000 enables high-sensitivity GC-FID analysis equivalent to using expensive compressed air cylinders.

Specifications

Maximum Air Flow Rate	1L/min
Withstand Pressure	800 kPa
Pressure Loss	30 kPa (at maximum flow rate)
Dimensions	W140 × D372 × H194 mm (excluding protrusions)
Weight	Approx. 5 kg



(Cat. No. C184-E029)

Air Compressor

Description	P/N
Oil-less Type	221-72380

This supplies oil mist-free compressed air to support combustion in FID and FPD.

Note: When connected to a GC system, the recommended flow rate is 2.5L/min. In order to get a stable supply gas, please do not connect it with over four FIDs.

Specifications

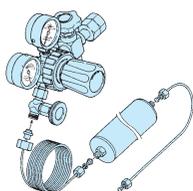
Weight	16 kg
Output	0.20 kW (50Hz) 0.24 kW (60Hz)
Delivery pressure	390±50 kPa
Flow Rate	Max. 30L/min (50Hz) 37L/min (60Hz)



GC Running Accessories Set

To carry out analyses with a gas chromatograph, some accessories and supplies are required. For this reason, Shimadzu provides a standard set of accessories and supplies, which are used in most types of gas chromatographic analyses. Sets with a carrier gas pressure regulator are also available.

Description	P/N
Standard Set (without a pressure regulator, shown at right)	221-38650-90
Standard Set + PPR-N ₂ pressure regulator	221-38650-91
Standard Set + PPR-He pressure regulator	221-38650-92



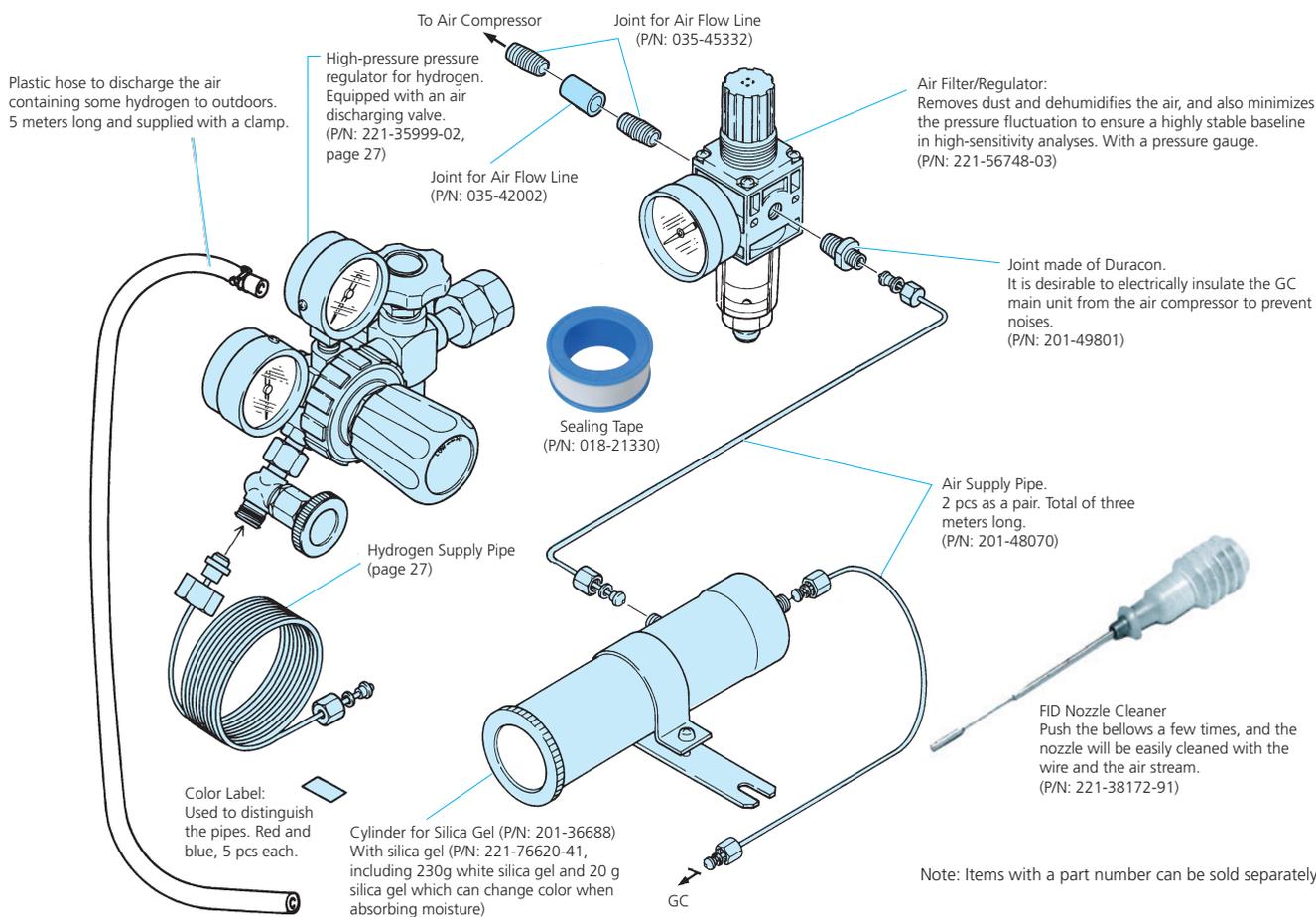
The standard set includes a carrier gas supply pipe, a gas filter, leak check fluid, tools, a pocket timer, a mirror for flame checking, a microliter syringe, column tags, quartz beads, color markers, a power outlet, and a case.



FID Operation Parts Set

Description	P/N
Without a pressure regulator	221-38651-90
With a pressure regulator, Hydrogen supply pipe (right-hand thread)	221-38651-91
With a pressure regulator, Hydrogen supply pipe (left-hand thread)	221-38651-92

This set includes the necessary accessories to supply air and hydrogen to an FID (or FPD) and the parts to clean an FID nozzle. For an FTD, please use PPR-H₂ and hydrogen supply pipes for hydrogen, and PPR-N₂ and gas pipes (see page 27) for high-purity air. It is also recommended to use those items if high-sensitivity analysis is performed by FID and FPD.



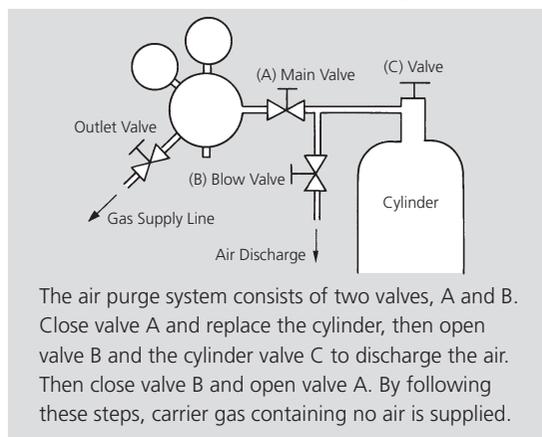
Pressure Regulator for High-Purity Gas (PPR Series)

Description	Purpose	P/N
PPR-N ₂	for Nitrogen, Air or Argon (Blue)	221-35999-01
PPR-H ₂	for Hydrogen (Red)	221-35999-02
PPR-He	for Helium (Yellow)	221-35999-03



During high-sensitivity analysis, even a small amount of air contained in carrier gas will cause problems. When the gas cylinder is replaced, conventional pressure regulators may allow some air to flow into the regulator, and then into the gas chromatograph. This will cause the baseline to be unstable, and will probably oxidize and decompose the liquid phase too. It is especially serious for capillary columns, which have only a very thin film of liquid phase. PPR series pressure regulators are designed for high-sensitivity analysis. They feature an air purge valve to remove the air and prevent it from flowing into the GC.

PPR series is recommended to be used with Nexis GC-2030/GC-2010 Plus or other GCs applicable to high-sensitivity analysis. An additional gas filter will increase the purity of supply gas (Due to limitations on the effectiveness of gas filters, they require periodic maintenance.) In the case of purging gas for sample concentration, the purge gas may cause ghost peaks. Therefore, PPR series can also be used for purge gas.



Gas Supply Pipe

These are three mmOD (2 mmID) stainless steel pipes. Joints at the pressure regulator side are M16P 1.5. (Joints for the hydrogen supply pipes are the same size but feature a left-hand thread.) Joints at the GC side are all Shimadzu M Type. The air supply pipes have Shimadzu M Type joints at both ends.

Description	P/N	Joint Type at Pressure Regulator Side	Joint Type at GC side
Gas Supply Pipe	2.5m	201-48067	Right-hand Thread
	5m	201-48067-05	
	10m	201-48067-10	
	15m	201-48067-15	
Hydrogen Supply Pipe	2.5m	221-18990-25	Left-hand Thread
	5m	221-18990-50	
	10m	221-18990-00	
Hydrogen Supply Pipe	2.5m	221-73474-25	Left-hand Thread
	5m	221-73474-50	
	10m	221-73474-00	
Air Supply Pipe (2 pcs, totally 3 m)	201-48070	-	All Right-hand Thread

Economic Pressure Regulator

Description	P/N
for Nitrogen or Argon (grey)	042-41099-01
for Hydrogen (red)	042-41099-02
for Helium (green)	042-41099-03

These pressure regulators are used for packed column GC analyses, using an FID or a TCD, that do not require high sensitivity. In order to reduce contamination from the pressure regulator, it is recommended to use a gas filter (Due to limitations on the effectiveness of gas filters, they require periodic maintenance.)

Note: Not applicable to Nexis GC-2030/GC-2010 Plus and high-sensitivity analysis.

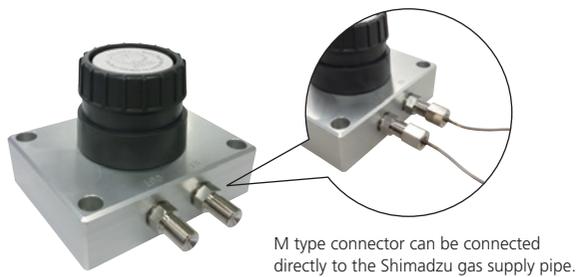


Super-Clean Gas Filter

The Shimadzu Super-Clean Gas Filter can remove the impurities (hydrocarbons, moisture and oxygen) and outlet 99.9999% pure gas. The use of high-purity and contaminant-free gases reduces column degradation, prevents ghost peaks and baseline fluctuations, eliminates excessive detector noise, and keeps your instrument in good working performance. (Gas filter has a limited lifetime and it is recommended to exchange the filter cartridge annually.)

Description	P/N
Shimadzu Carrier Gas Filter Kit	227-37001-02
Shimadzu Gas Filter Kit for GC-FID/FPD	227-37003-01
Shimadzu Makeup Gas Filter Kit for separate makeup gas	227-37001-01
Shimadzu Gas Filter Kit for GC-ECD	227-37002-01
Shimadzu Gas Filter Kit for compressed air	227-37003-02

* For detailed information, please refer to the separate flyer (Cat. No.: C180-E083).



The fittings connecting the filter and gas supply pipe are Shimadzu M type. Connecting directly to Shimadzu gas supply pipes ensures a leak-free and completely clean gas line.



Shimadzu Gas Filter Kit for GC-FID/FPD

Shimadzu Carrier Gas Filter Kit

The design of the Shimadzu Super-Clean Gas Filter makes it possible to replace filter cartridges quickly and easily without any tools. Spring-loaded check valves seal when a cartridge is removed and open only when a new cartridge has been locked in place, which prevents contamination of the system during the replacement process.

As long as there is no filter cartridge connected, the spring-loaded check valves block the gas stream automatically.



Installing the filter

Split Filter

This filter protects the flow controller (AFC) from contamination by samples discharged from the SPL split line. SPL-2030 filters can be replaced by hand. Also, visibility of the interior enables the filter contamination level to be confirmed at first sight.

left : for SPL-2010Plus/SPL-2010/SPL-2014/SPL-2025
right : for SPL-2030

Description	Applicable GC	P/N
for SPL-2030	Nexis GC-2030	221-77580-42
for SPL-2010/SPL-2010Plus/SPL-2014/SPL-2025	GC-2010/2010Plus, GC-2014, GC-2025	221-42559-92



Oxygen Trap

This adsorbs the oxygen in a gas. One piece of this is capable of adsorbing about 500mL of oxygen. The trap is easily regenerated by allowing hydrogen to flow under a high temperature condition of 100~150 °C. Equipped with 1/8inch Swagelok joints, and supplied with two adapters for Shimadzu M Type joints.

P/N	221-46985-91
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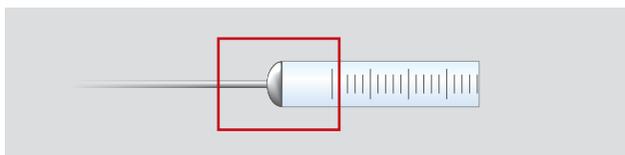
Syringe

Syringe Selection Guide

If a syringe is being used by hand, a manual syringe should be selected. If a syringe is installed in an AOC autosampler, then choose the appropriate syringe and volume to suit your instrument and application.

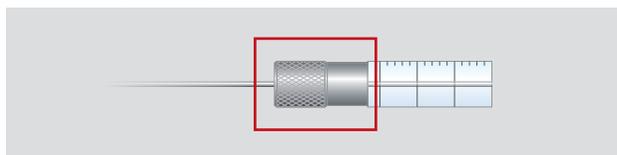
Syringe Style

Fixed Needle



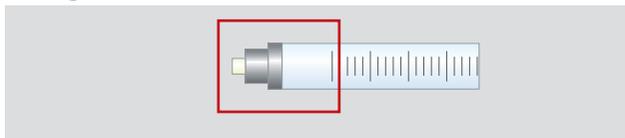
- Better option for experienced users or for applications requiring trace sample levels
- Recommended for use with an autosampler because the probability of needle bending is minimal
- Minimal sample carryover

Removable Needle



- Better option for inexperienced users
- Reduce cost if used in precipitation of salts or in situations in which it may bend easily (such as thick septum)
- Available for many methods by changing needles

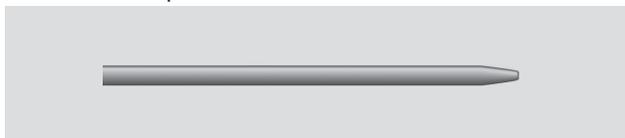
Gas Tight



- For Luer Lock needles and fittings
- Specifically designed to install and secure Luer Lock needles easily

Needle Tip Style

Cone: Autosampler



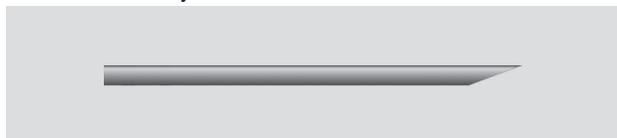
The cone-shaped needle tip is specially developed to withstand multi injection demands and improve septum lifetime when used with an autosampler. The cone design effectively “parts” the septum during piercing instead of cutting it, as would a bevel needle.

Side Hole Dome



Samples are filled and dispensed through the side hole, eliminating septum plugging of the needle. Ideal for large-volume gas injections. The solid domed tip minimizes septum damage.

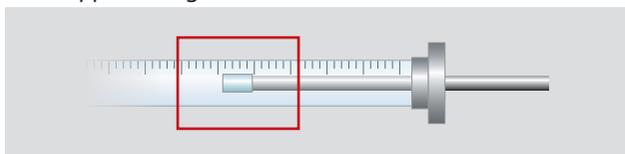
Bevel: Manual Injection



The standard general-purpose needle tip style supplied with many syringes is a 20 ° bevel tip. It is the preferred option for manual injection when piercing the septum in exactly the same place is difficult. The bevel tip is designed for optimum septum penetration and prevention of septum coring.

Plunger Style

PTFE Tipped Plunger



- PTFE Tip enables gastight analysis
- Suitable for both liquid and gas samples
- Ideal for analysis of highly viscous liquid because it reduces the possibility of the plunger sticking due to micro particles (samples should have no effects with PTFE)
- Plunger is replaceable

Note: Other kinds of syringes are also available. Please refer to pages 32 and 33.

Syringe for AOC-20i/20s

Syringe Volume	PTFE Tipped Plunger	Needle Length (mm)	Needle Gauge	Needle OD (mm)	Needle Tip	P/N	Replacement Plunger P/N	Replacement Needle P/N
5 µL	-	42	23	0.63	Cone	221-75173	-	-
10 µL	✓	42	23	0.63	Cone	221-74469	-	-
10 µL	-	42	23	0.63	Cone	221-34618	-	-
10 µL	✓	42	23	0.63	Cone	221-75174	221-75174-02	221-75174-01
50 µL	-	42	23	0.63	Cone	221-45243	-	-
250 µL	✓	42	23	0.63	Cone	221-45244	221-45244-01	-

Description	P/N	Syringe Volume
Syringe for OCI	221-37282-02	10 µL
Elastic Syringe for AOC *	221-49548	10 µL

* Plunger is made of titanium. It has less wear debris compared to metal, making it less hard and ideal for hydrous sample.

Syringe for AOC-5000

Syringe Volume	PTFE Tipped Plunger	Needle Length (mm)	Needle Gauge	Needle OD (mm)	Needle Tip	P/N
10 µL	-	50	26	0.47	Cone	221-75175
10 µL	-	50	23	0.63	Cone	221-75175-01
10 µL	-	80	26	0.47	Cone	221-75176
10 µL	-	80	23	0.63	Cone	221-75176-01
10 µL	✓	50	26	0.47	Cone	221-75175-02
10 µL	✓	50	23	0.63	Cone	221-75175-03
25 µL	✓	50	23	0.63	Cone	221-75177
1 mL	✓	50	26	0.47	Side Hole Dome	221-75178
1 mL	✓	50	23	0.63	Side Hole Dome	221-75178-01
2.5 mL	✓	50	26	0.47	Side Hole Dome	221-75179
2.5 mL	✓	50	23	0.63	Side Hole Dome	221-75179-01

Syringe for AOC-6000

Syringe Volume	PTFE Tipped Plunger	Needle Length (mm)	Needle Gauge	Needle OD (mm)	Needle Tip	P/N
1 µL	-	57	23	0.63	Cone	225-19744-01
5 µL	-	57	26	0.47	Cone	225-19744-02
10 µL	-	57	26	0.47	Cone	225-19744-03
10 µL	✓	57	26	0.47	Cone	225-19744-04
25 µL	✓	57	26	0.47	Cone	225-19744-05
50 µL	✓	57	26	0.47	Cone	225-19744-06
100 µL	✓	57	26	0.47	Cone	225-19744-07
250 µL	✓	57	26	0.47	Cone	225-19744-08
500 µL	✓	57	26	0.47	Cone	225-19744-09
1 mL	✓	57	23	0.63	Side Hole Dome	225-19744-10
2.5 mL	✓	65	23	0.63	Side Hole Dome	225-19744-11

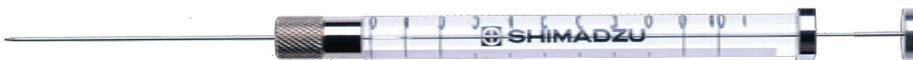
Manual Syringe

Shimadzu manual syringes are available from 5 µL to 500 µL, and can be widely used in your laboratory work.



Fixed Needle Style

Syringe Volume	PTFE Tipped Plunger	Needle Length (mm)	Needle Gauge	Needle OD (mm)	Needle Tip	P/N	Replacement Plunger	
							P/N	Qty
5 µL	-	50	26	0.47	Bevel	221-75170	-	-
10 µL	-	50	26	0.47	Bevel	670-12552-01	-	-
10 µL	✓	50	26	0.47	Bevel	221-75170-01	221-75170-02	2
25 µL	-	50	25	0.5	Bevel	670-12510-31	-	-
25 µL	✓	50	25	0.5	Bevel	221-75171	221-75171-01	1
50 µL	-	50	25	0.5	Bevel	670-12510-36	-	-
50 µL	✓	50	25	0.5	Bevel	221-75172	221-75172-03	1
100 µL	-	50	25	0.5	Bevel	670-12510-18	-	-
100 µL	✓	50	25	0.5	Bevel	221-75172-01	221-75172-04	1
250 µL	-	50	25	0.5	Bevel	670-12510-19	-	-
250 µL	✓	50	25	0.5	Bevel	221-75172-02	221-75172-05	1
500 µL	-	50	25	0.5	Bevel	670-12510-20	-	-



Removable Needle Style

Syringe Volume	PTFE Tipped Plunger	Needle Length (mm)	Needle Gauge	Needle OD (mm)	Needle Tip	P/N	Replacement Plunger P/N	Replacement Needle P/N
10 µL	✓	50	26	0.47	Bevel	670-12553-21	670-12553-33	670-12510-95
25 µL	-	50	25	0.5	Bevel	670-12510-74	-	670-12510-96
50 µL	-	50	25	0.5	Bevel	670-12510-75	-	
100 µL	-	50	25	0.5	Bevel	670-12510-76	-	
250 µL	-	50	25	0.5	Bevel	670-12510-77	-	
500 µL	-	50	25	0.5	Bevel	670-12510-78	-	

Syringe for Gas Analysis

Luer Lock Needle Style

Syringe Volume	PTFE Tipped Plunger	P/N	Replacement Plunger P/N
1 mL	✓	221-54778-01	221-54778-11
5 mL	✓	221-54778-02	221-54778-12
10 mL	✓	221-54778-03	221-54778-13
25 mL	✓	221-54778-04	221-54778-14
50 mL	✓	221-54778-05	221-54778-15
100 mL	✓	221-54778-06	221-54778-16

Luer Lock Needle

Needle Length (mm)	Needle Gauge	Needle OD (mm)	Needle Tip	Qty	P/N
50	23	0.63	Bevel	5	221-54778-51
50	19	1.07	Bevel	5	221-54778-52
50	14	2.1	Bevel	5	221-54778-54



Syringe Valve

Diag. #	Syringe Volume	Description	Qty	P/N
①	5 mL to 2 L	Push Button Valve for Luer Lock Needle	1	221-54778-49
②	50 µL to 2 L	Push Button Valve for Luer Lock Needle and Tip Syringe	1	221-54778-50



Removable Needle Style

Gastight syringes with a capacity of milliliter quantity level. The needle is 30mm long and is of a screw-in type, which ensures an easy exchange.

Description	P/N	Syringe Volume	Replacement Needle P/N
MS-GAN025	670-12504-28	0.25 mL	670-12504-85 (5 pcs)
MS-GAN050	670-12504-29	0.5 mL	
MS-GAN100	670-12504-30	1 mL	
MS-GAN250	670-12504-31	2.5 mL	
MS-GAN500	670-12504-32	5 mL	
MS-GANX00	670-12504-33	10 mL	



PIN Style Microsyringe

Plunger-in-needle style. The plunger goes into the needle tip to eliminate dead volume. Ideal for highly precise analysis of micro-volume samples.

Description	P/N	Syringe Volume
0.5BR-7	670-12510-71	0.5 µL
1BR-7	670-12510-72	1 µL
5BR-7	670-12510-73	5 µL



Microsyringe with Plunger Guide

This type of microsyringe has an extended barrel (120 mm long) to prevent the plunger from bending.

Description	P/N	Syringe Volume	Replacement Needle P/N
10R-GP	670-12510-80	10 µL	670-12510-95 (5 pcs)
5R-GPS	670-12510-86	5 µL	670-12510-94 (5 pcs)



Gastight Seal Style Microsyringe

A gas gland is provided at the rear of the barrel to ensure pressure resistance of 15 kgf/cm² (100 µL or less in capacity) or 12 kgf/cm² (250 µL or larger in capacity).

Description	P/N	Syringe Volume	Replacement Needle P/N
25R-GSG	670-12510-81	25 µL	670-12510-96 (5 pcs)
50R-GSG	670-12510-82	50 µL	
100R-GSG	670-12510-83	100 µL	
250R-GSG	670-12510-84	250 µL	
500R-GSG	670-12510-85	500 µL	



Elastic Plunger Style Microsyringe

These syringes use a titanium alloy plunger, which is highly flexible and corrosion resistant. The high flexibility of the plunger ensures stable injection of samples as small as 5 µL. The needle is 0.41 mm in tip diameter, which is suitable for on-column injection into a capillary column.

Description	P/N	Syringe Volume	Replacement Needle P/N
MS-E05-CS	670-12580-21	5 µL	Fixed Needle
MS-E10-CS	670-12580-22	10 µL	
MS-NE05-CS	670-12580-25	5 µL	670-12580-31 (5 pcs)
MS-NE10-CS	670-12580-26	10 µL	



Microsyringe with Guide Bar

A guide bar is installed parallel to the plunger, which prevents the plunger from bending. A stopper is also provided to allow a preset amount of sample to be injected accurately without reading the scale in each run.

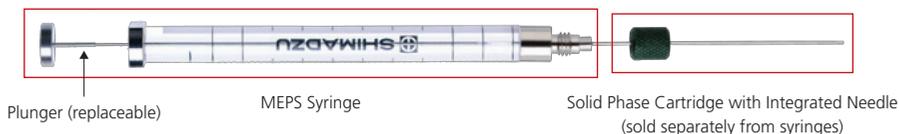
Description	P/N	Syringe Volume	Replacement Needle P/N
MS-G10	670-12504-25	10 µL	Fixed Needle
MS-NG10	670-12504-22	10 µL	670-12504-86 (5 pcs)



Micro Solid Phase Extraction Syringe MEPS™

Micro extraction by packed sorbent (MEPS) is a tool that provides a new way to pretreat samples. By using less packing material (about 3 mg), it can reduce the amount of solvent used down to the milliliter level. Because MEPS solid phase cartridges can be reused multiple times, the method not only improves the efficiency of sample pretreatment and concentration adjustment processes, but also helps reduce costs.

MEPS is a micro-solid phase extraction (μ SPE) method that combines micro-solid phase cartridges with high-quality microsyringes. MEPS solid phase cartridges (MEPS BIN) reduce the quantity of solid phase packing material used from the conventional mL-level to the μ L-level. C2, C8, C18, silica, and other MEPS solid phases can be used.



MEPS™ Syringe for AOC-20i/20s

Syringe Volume	PTFE Tipped Plunger	P/N	Replacement Plunger	
			P/N	Qty
100 μ L	✓	221-74830-01	221-74830-10	1

Phase	Qty	P/N
C18	5	221-74830-03
Silica	5	221-74830-04
C8 + SCX	5	221-74830-05
C2	5	221-74830-06
C8	5	221-74830-07
PDVB	5	221-74830-02
SDVB	5	221-74830-11
HDVB	5	221-74830-12
Development Kit	1 each of C18, C8, Silica, C8+SCX, C2	221-74830-08

MEPS™ Syringes for AOC-5000

Syringe Volume	PTFE Tipped Plunger	P/N	Replacement Plunger	
			P/N	Qty
100 μ L	✓	221-75202-01	221-75202-03	1
250 μ L	✓	221-75202-02	221-75202-04	1

Phase	Qty	P/N for 100 μ L syringe	P/N for 250 μ L syringe
C18	5	221-75198-01	221-75199-01
Silica	5	221-75198-02	221-75199-02
C8 + SCX	5	221-75198-03	221-75199-03
C2	5	221-75198-04	221-75199-04
C8	5	221-75198-06	221-75199-06
Development Kit	1 each of C18, C8, Silica, C8+SCX, C2	221-75198-05	221-75199-05

PTV Insert for AOC-MEPS System



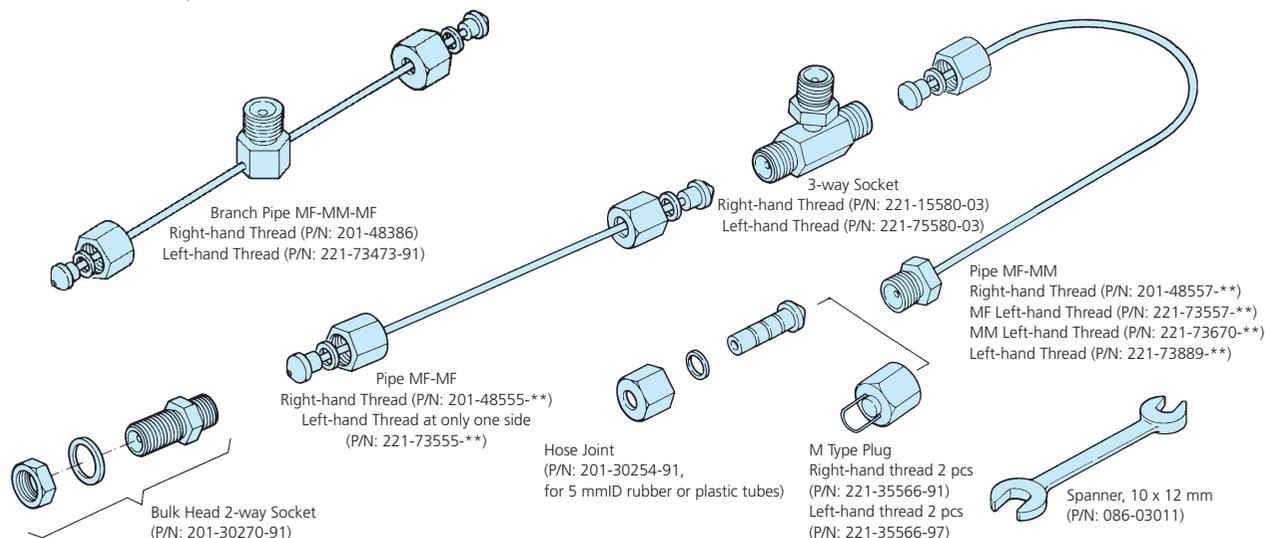
AOC-20i + GC-2010 + PTV configuration

OD (mm)	ID (mm)	Length (mm)	Qty	P/N
3.5	2.5	95	5	221-74830-09

Parts for Tubing

Shimadzu M Type Joint

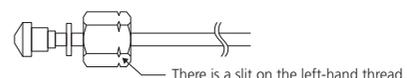
Shimadzu M type joints are widely used as tubing parts in Shimadzu gas chromatographs. The connections are made leak-free by the contact of metal surfaces. 12mm spanners are used for the connection.



Note 1: ** at the end of a part number indicates the length of the pipe in centimeter units.

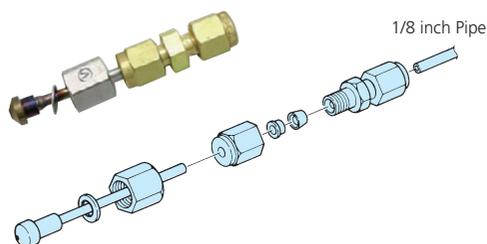
For details, please contact your local Shimadzu representative.

Note 2: Left-hand thread of the pipe for hydrogen has a slit as a mark. Please refer to the figure at right.



Swagelok Adapter

P/N	221-25975-92
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This adapter is used to connect a 1/8" stainless pipe to a Shimadzu M type Joint. (includes a Swagelok union)

Needle Valve

P/N	221-57298
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This valve is used to control the gas flow rate. The control range is 0 - 0.7L/min for nitrogen under an inlet pressure of 300 kPa. Shimadzu M type joints are used at both the inlet and outlet.

Thread Adapter

Description	P/N
MM-PT1/4	201-34675
MM-PT1/8	221-03106



MM-PT1/4



MM-PT1/8

This adapter is used to connect a Shimadzu M type joint to a JIS type tapered thread.

Syringe for Cleaning

P/N	221-35641-91
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This is a 10 mL syringe with an M type joint. It is conveniently used to wash the inside of a tube with a solvent.



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