

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.



High-end Capillary Gas Chromatograph

GC-2010 Plus + AOC-20i/20s (Option)

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.

- Temperature Range: (Room temperature + 4°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 Injector: Split/splitless, direct injection, on-column/programmed temperature vaporization
 - Detectors: FID, TCD, BID, FTD, FPD, ECD
 - Display: 30 characters x 16 lines, permits chromatogram display
- (Cat. No. C184-E019)

GC-2010 Plus AF

Split/splitless injector and FID are installed, making it suitable for the analysis of organic compounds.

- Detector: FID
- Temperature Range: to 450°C
- Minimum Detected Quantity: 1.5 pgC/s (dodecane)

Tracera (GC-2010 Plus + BID-2010 Plus)

Tracera utilizes the new Barrier Discharge Ionization Detector technology coupled with a GC-2010 Plus capillary gas chromatograph. This configuration creates a GC system that makes it possible to reveal trace components that are difficult to see by other GC detectors.

- Detector: BID
 - Temperature Range: to 350°C
 - Minimum Detected Quantity: 1 pgC/s (dodecane, discharge gas flow rate 50 mL/min)
- (Cat. No. C184-E032)

GC-2010 Plus AT

Split/splitless injector and micro volume TCD are installed, making it suitable for high-sensitivity analysis of various samples, including inorganic gases.

- Detector: TCD (dual filament)
- Temperature Range: to 400°C
- Sensitivity: 20,000 mV • mL/mg (decane)

* System installed with Auto Sampler AOC-20i is also available.

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-2014 + 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)



GC-2025 + AOC-20i (Option)

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)



Contents

	Description		P/N	Applicable models *1				Applicable previous models *2	Remarks	Page
				GC-2010 Plus	GC-2014	GC-2025	GC-8A			
Workstation/Data Processor	Integrated Workstation	LabSolutions	-	✓	✓	△		①② ⑥		6
	GC Workstation	GCsolution ver. 2	-	△	✓	△		①②③④ ⑥		
	Chromatopac C-R8A (SD card version)		221-80450-32	✓	✓	✓	✓	①②③④⑤⑥	100V and 115V	
			221-80450-38	✓	✓	✓	✓	①②③④⑤⑥	230V	
	Simulated Distillation GC Software		223-61510-92	for LabSolutions						7
	PONAsolution		221-57833-92	for GCsolution						
	HS-20 Support Kit		223-07736-92	for LabSolutions						
	HS-10 Support Kit		223-07740-92	for LabSolutions						
	Chart Paper		See article	for Chromatopac						
	Direct-connection Signal Cord		See article	Please refer to the article.						
External Device Controller		PRG-2010 Plus	221-49387-44	✓	✓			⑥		
Expansion Case			223-04592-91	for C-R8A						
Sampling Device	Auto Injector	AOC-20i	221-72315-58	✓				⑥		8
			221-72314-58		for 2014					
			221-73957-58			✓				
			221-72354-48	△	△	△		①②③ ⑤⑥		
	Auto Sampler	AOC-20s	221-72300-58	✓	△	✓		①②③④⑤⑥		9
	Headspace Sampler	HS-20	225-21900-42	✓				⑥	115V	
			225-21900-58	✓				⑥	230V	
		HS-20 Trap	225-22000-42	✓				⑥	115V	
			225-22000-58	✓				⑥	230V	
		HS-20 LT	225-22050-42	✓	△			⑥	115V	
			225-22050-58	✓	△			⑥	230V	
		HS-10 Transfer line 1.0m	221-76862-03	✓					115V	
			221-76862-05	✓					230V	
		HS-10 Transfer line 1.6m	221-76862-04		✓				115V	
			221-76862-06		✓				230V	
Detector	Flame Ionization Detector	FID-2010 Plus	221-73345-42	✓				⑥	115V	10
			221-73345-48	✓				⑥	230V	
		FID-2014 Single	221-75030-42		✓				115V	
			221-75030-44		✓				230V	
	Supply Gas Shut-off Solenoid Valve Unit			221-70782-41		✓				11
	Flame Monitor	FLM-2	221-41590-91	✓	△			③ ⑥	100V	
			221-41845-97				✓	①②	100V	
	Methanizer	MTN-1	221-41820-92	△	△		△	①②③④⑤⑥	115V	
	Flame Thermionic Detector	FTD-2010 Plus	221-73332-42	✓				⑥	115V	
			221-73332-48	✓				⑥	230V	
		FTD-2014	221-75033-42		✓				115V	
			221-75033-44		✓				230V	
		FTD-2014C	221-75034-42		△				115V	
			221-75034-44		△				230V	
	Flame Photometric Detector	FPD-2010 Plus	221-73334-42	✓					115V	
			221-73334-48	✓					230V	
		FPD-2010	221-47734-92					⑥	115V	
221-47734-38							⑥	230V		
FPD-2014		221-75031-42		✓				115V		
		221-75031-44		✓				230V		
Thermal Conductivity Detector	TCD	-	Please request a GC system pre-installed with TCD.						12	
Barrier Discharge Ionization Detector	BID-2010 Plus	221-76000-42	✓					115V		
		221-76000-44	✓					230V		
Preamplifier	AMP-7B	221-41816-91				✓	①②		13	
Electron Capture Detector	ECD-2010 Exceed	221-77550-42	✓							
	ECD-2010 Plus	221-47733-42	✓				⑥			
	ECD-2014	221-75032-42		✓				115V		
		221-75032-44		✓				230V		
Sample Injection Unit	Split/Splitless Sample Injection Unit	SPL-2010 Plus	221-73040-41	✓					115V	14
			221-73040-48	✓					230V	
		SPL-2010	221-71040-91					⑥	115V	
			221-71040-38					⑥	230V	

*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

	Description		P/N	Applicable models *1				Applicable previous models *2	Remarks	Page
				GC-2010 Plus	GC-2014	GC-2025	GC-8A			
Sample Injection Unit	Split/Splitless Sample Injection Unit	SPL-2014	221-75046-41		✓				115V	14
			221-75046-44		✓				230V	
	Wide-Bore Injection Unit	WBI-2010 Plus	221-73041-41	✓				⑥	115V	
			221-73041-48	✓				⑥	230V	
		WBI-2014	221-75047-41		✓				115V	
			221-70047-34		✓				230V	
		WBI-2014 (AMC)	221-75038-41		✓				115V	
			221-70038-34		✓				230V	
	On-column/Programmed Temperature Vaporization Injection Unit	OCI/PTV-2010	221-71042-41	✓				⑥	115V	
			221-71042-44	✓				⑥	230V	
	Wide-Bore Capillary Column Attachment		221-29992-91		✓		✓	①②		
Valve/Valve Applied Device	Splitter Attachment	CLH-800	221-23743-91				△			15
	Nut and Ferrule for Capillary Column		See article	✓		✓	✓	①②③④⑤⑥		
	Injection Port Septum		See article	Please refer to the article.						
	Glass Insert		See article	Please refer to the article.						
	4, 6, 8 and 10 Ports Rotary Valve		See article	Solution system utilized rotary valve and actuator is available.						
Cryogenic Work Attachment	Valve Actuator	VLA-1	221-25930-91						100V	18
	Gas Sampler	MGS-2010	221-75363-41	✓						
		MGS-4	221-42574-02	△	△		△	②③ ⑥		
		MGS-5	221-42576	△	△		△	②③ ⑥		
	Heated Gas Sampler	HGS-2	221-42571	△	△		△	①②③ ⑥		
Installation Accessories and Supplies	Cryogenic Work Attachment	CRG-8	221-24660-92				✓		100V	19
	Cryogenic Valve Unit	2010 CO ₂	221-48703-42	✓	✓			⑥	115V	
			221-48703-48	✓	✓			⑥	230V	
		2025 CO ₂	221-73920-42			✓			115V	
			221-73920-44			✓			230V	
		2010 LN ₂	221-49588-42	✓	✓			⑥	115V	
			221-49588-48	✓	✓			⑥	230V	
		Solenoid valve LN ₂	221-43847-92				△	③ ⑤	115V	
			221-43847-38				△	③ ⑤	230V	
	Air Generator	AGE-1000	221-74500-03	△	△	△	△	①②③④⑤⑥	115V, only for FID	20
	Air Compressor	Oil-less Type	221-74500-02	△	△	△	△	①②③④⑤⑥	230V, only for FID	
Parts for Tubing	Air Dryer Unit		221-72380		△		✓	①②③④⑤⑥	100V	
	GC Running Accessories Set		See article	✓	✓	✓	✓	①②③④⑤⑥		
	FID Operation Parts Set		See article	✓	✓	✓	✓	①②③④⑤⑥		21
	Pressure Regulator for High-Purity Gas	PPR-N ₂	221-35999-01	✓	✓	✓	✓	①②③④⑤⑥	for Nitrogen or Argon (Blue)	
		PPR-H ₂	221-35999-02	✓	✓	✓	✓	①②③④⑤⑥	for Hydrogen (Red)	
		PPR-He	221-35999-03	✓	✓	✓	✓	①②③④⑤⑥	for Helium (Yellow)	
	Gas Supply Pipe		See article	△	△	△	△	①②③④⑤⑥		22
	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	
	Branch Valve		221-33973-92	✓	✓	✓	✓	①②③④⑤⑥		
	Digital Flow Meter	DFM-1000	-	✓	✓	✓	✓	①②③④⑤⑥		23
	Super-Clean Gas Filter		See article	✓	✓	✓	✓	①②③④⑤⑥		
	Fluid for Leak Check		670-11514	✓	✓	✓	✓	①②③④⑤⑥		
Syringe	Syringe		See article	Please refer to the article.						24 - 28
	Micro Solid Phase Extraction Syringe	MEPST TM	See article	Available for both manual use and autosampler						29 - 30
Parts for Tubing	Shimadzu M Type Joint		See article	△	△	△	△	①②③④⑤⑥		31
	Swagelok Adapter		221-25975-92	△	△	△	△	①②③④⑤⑥		
	Thread Adapter	MM-PT1/4	201-34675	△	△	△	△	①②③④⑤⑥		
		MM-PT1/8	221-03106	△	△	△	△	①②③④⑤⑥		
	Needle Valve		221-57298	△	△	△	△	①②③④⑤⑥		
	Syringe for Cleaning		221-35641-91	△	△	△	△	①②③④⑤⑥		

Workstation/Data Processor

Integrated Workstation LabSolutions

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.

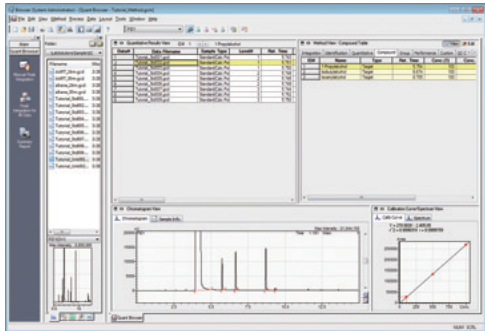
LabSolutions enables higher operability and productivity.

Applicable for GC-2010/2010 Plus, GC-2025 ^{*1}, GC-2014, GC-14B ^{*2}.

^{*} Not applicable for PONAsolution, MDGCSolution. Please use GCsolution instead.

^{*1} Ver. 5.51 or later and ver. 6.10 or later are capable of controlling GC-2025.

^{*2} CBM-102 (P/N: 223-04860-31) is required for controlling GC-14B.



GC Workstation GCsolution ver. 2

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.

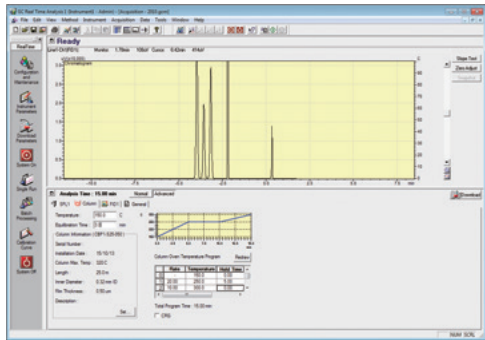
Applicable system: GC-2010/2010 Plus ^{*1}, GC-2014, GC-2025 ^{*2}, GC-17A ^{*3},
GC-1700 ^{*3}, GC-14A/B ^{*3,4}

^{*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.



(Cat. No. C184-E012G)

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-E001D)

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
PONA solution	221-57833-92

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

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.

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

For C-R8A, C-R7A plus

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

For C-R7A plus

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

For C-R5A

Description	P/N
Transmission Interface	223-02983-92

For Chromatopac

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

* Not required for GC-17A (ver. 2 or later) and for GC-17AAFw (ver. 1).

Expansion Case (for C-R8A)

P/N	223-04592-91
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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, C-R7A plus

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 (10 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

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

Applicable GC		P/N
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 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 C-R7A plus or C-R8A, and the detector signal output is set to Linear.

External Device Controller PRG-2010 Plus

Description	P/N	Remarks
PRG-2010 Plus	221-49387-44	To control the device driven by 24V
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 230V

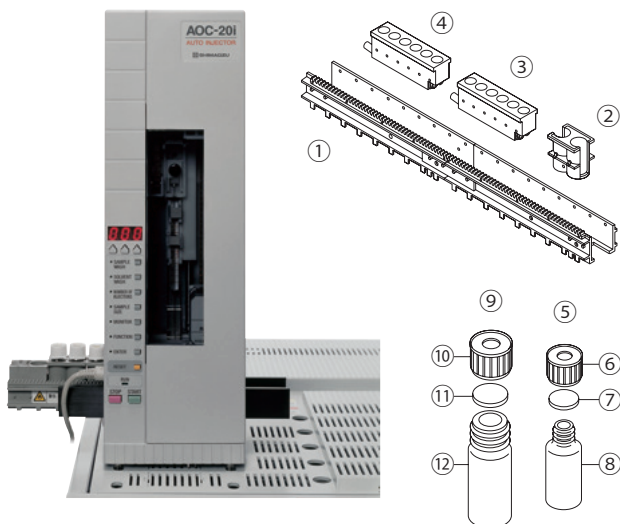
PRG-2010 Plus is necessary for controlling valves, pumps and other external devices. It enables the control of the device driven by 24V DC supplied from GC-2010 Plus or GC-2014. An extra PRG BOX is required if a device driven by 100V AC or 230V AC is added. With PRG-2010 Plus you are not only able to control an external device from a GC system, but also from LabSolutions, GCsolution and Chromatopac (C-R8A, C-R7A plus), which connected to a GC system by a RS-232C cable.



PRG BOX

Sampling Device

Auto Injector AOC-20i



- 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 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)

Applicable GC	P/N
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

Option

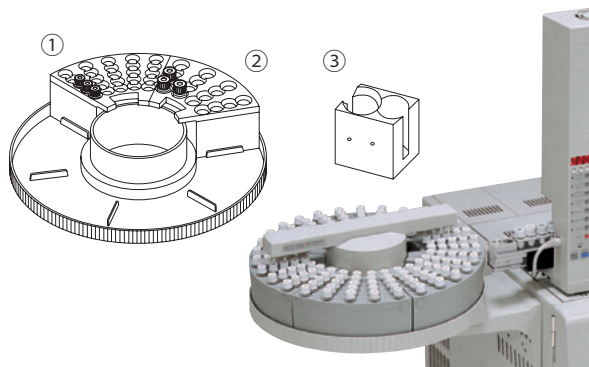
Diag. #	Description	P/N
①	Long Rack Assembly (suitable for 12 pcs of 1.5 mL Sample vials)	221-45622-91
②	4 mL Vial Rack (1 rack is included in AOC-20i)	221-32949-01
③	1.5 mL Vial Rack (1 rack is included in AOC-20i)	221-45609-92
④	1.5 mL Vial Extension Rack	221-45609-91
△	Sample Cooling Fan *1	221-44995-91
△	FPD Cooling Fan *2	221-44996-91
△	10 µL Syringe	221-34618
△	50 µL Syringe	221-45243
△	250 µL 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 24.

*1 Minimize the temperature increase of sample.

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

Auto Sampler AOC-20s



- 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. (GC-2010/2010 Plus only)

P/N	221-72300-58
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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 24.

Headspace Sampler HS-20 Series

Description	Applicable GC	P/N	Remarks
HS-20	GC-2010/2010 Plus	225-21900-42	115V
		225-21900-58	230V
HS-20 Trap		225-22000-42	115V
		225-22000-58	230V
HS-20 LT	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: For the control software, please refer to page 7.

(Cat. No. C146-E209A)



HS-20 + GC-2010 Plus

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

Applicable GC	P/N	Remarks
GC-2010 Plus (transfer line 1.0m)	221-76862-03	115V
	221-76862-05	230V
GC-2014 (transfer line 1.6m)	221-76862-04	115V
	221-76862-06	230V

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 + GC-2010 Plus

Detector

Flame Ionization Detector (FID)

Description	Applicable GC	P/N	Remarks
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 21 for details.

Specifications

Electrode	Cylindrical
Electrode Voltage	±200V
Dynamic Range	10 ⁷
Minimum Detected Quantity	GC-2010/2010 Plus: 1.5pgC/s GC-2014: 3pgC/s
Maximum Operating Temp.	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 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
②	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.

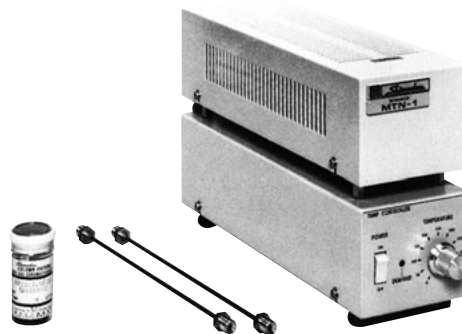
Note 1: In GC-2010/2010 Plus/2025, detector supply gas is controlled by APC.

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).

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 catalyst. 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 catalyst (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-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

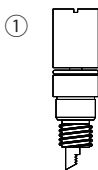
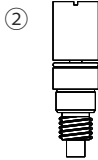
Note: FTD requires hydrogen and air as supply gas. Supply air should be from a high-purity air cylinder. It is not recommended to use air from a compressor.

Replacement Parts

Diag. #	Description	P/N
	FTD Collector Regeneration Kit *	221-49079-91
①	FTD-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-2010/2010 Plus/2014C collector by replenishing the alkali-ion source.

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

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

Flame Photometric Detector (FPD)

Description	Applicable GC	P/N	Remarks
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.

Specifications

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

Interference Filters

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

For GC-2010 Plus

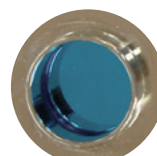
Description	P/N
S filter for Sulfur Detection (Blue)	221-73354-01
P filter for Phosphorus Detection (Yellow)	221-73354-02
Sn filter for Tin Detection (Orange)	221-73354-03

For GC-2010 and GC-2014

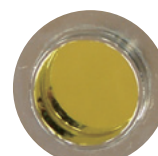
Description	P/N
S filter for Sulfur Detection (Blue)	221-46310-01
P filter for Phosphorus Detection (Yellow)	221-46310-02
Sn filter for Tin Detection (Orange)	221-46310-03

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



S filter



P filter



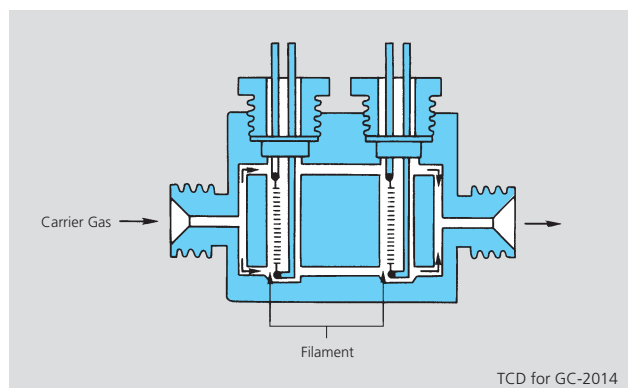
Sn filter

Note 1: Hydrogen and supply air are necessary for FPD. Please refer to page 21 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.

Thermal Conductivity Detector (TCD)

TCD features a simple design and easy operation, and is able to sense any substances except the carrier gas. A bridge circuit is formed with four matched tungsten-rhenium filaments (100Ω, each).

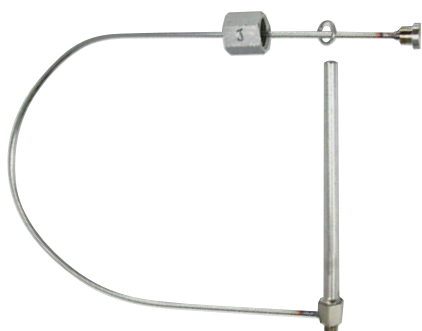


TCD must be pre-installed in a Shimadzu factory. Otherwise, the specified noise level and sensitivity cannot be guaranteed.

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.



Barrier Discharge Ionization Detector (BID)

Description	Applicable GC	P/N	Remarks
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	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. %)

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.

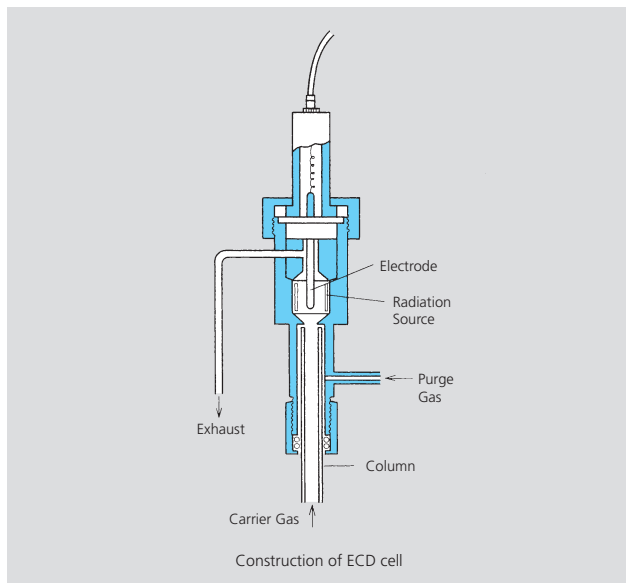
Note: Not required for GC-2010/2010 Plus and GC-2014.



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 23 for the details of oxygen trap.



Specifications

Type	Constant current, pulse frequency control
Radiation Source	^{63}Ni 370MBq
Electric Current	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	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-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.

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-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-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/PTV-2010	GC-2010/ 2010 Plus	221-71042-41	115V
		221-71042-44	230V

* Not applicable for GC-2014.

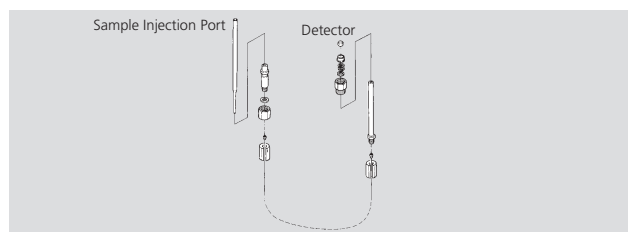
With the on-column sample injection method, the sample solution is injected directly into the column and the entire sample is subjected to analysis. As a result, there is no discrimination due to differences in boiling points. It can be used for a wide range of samples with both low and high boiling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

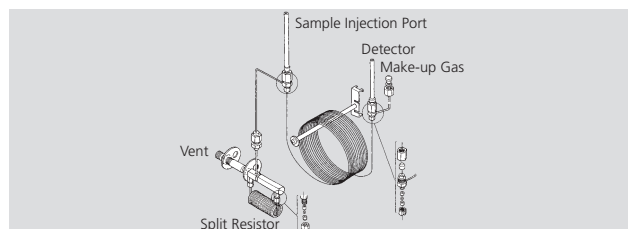
Wide-Bore Capillary Column (WBC) Attachment



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 13) and supply gas line for make-up gas are required.

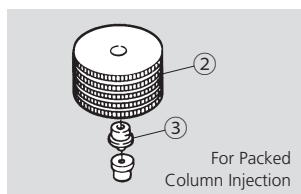
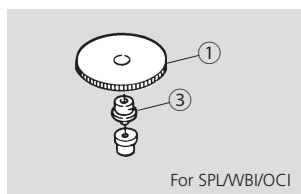
Splitter Attachment CLH-800



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.

Parts of Injection Port



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

Nut and Ferrule for Capillary Column

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 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.



Diag. #	Description	Applicable GC	P/N
①	Nut with slit	5 pcs	221-32705-84
②	Nut without slit	10 pcs	221-16325-81
③	Graphite Ferrule 0.5	10 pcs, For 0.1 - 0.32 mmID columns	221-32126-05
③	Graphite Ferrule 0.8	10 pcs, For 0.53 mmID columns	221-32126-08

Injection Port Septum

Description	P/N	Color	Features
 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. • 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. • 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. • Low-bleed, suitable for high-sensitivity analysis
 Enduro Blue Septum (50 pcs)	221-75180	Light blue	• Low-bleed, suitable for high-sensitivity analysis at high temperatures • Maximum temperature (INJ setting temperature): 350°C

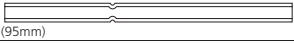
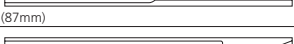
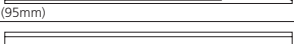
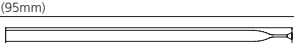
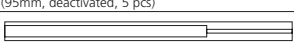
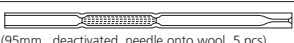
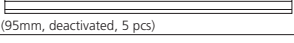
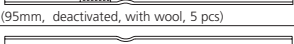
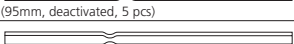
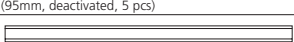
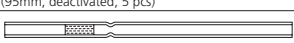
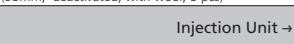
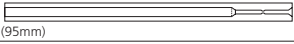
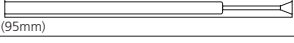
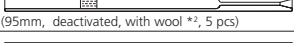
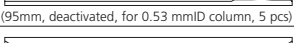
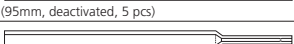
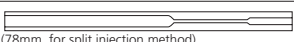
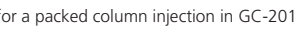
Low-bleed septum is not completely free of bleeding. The type of bleeding that occurs varies with the septum, and results in different patterns on chromatograms. In the case of high-sensitivity analysis, it is necessary to select a septum whose bleeding will not occur at a point that interferes with 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

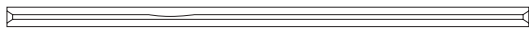
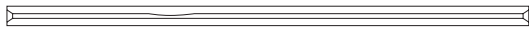
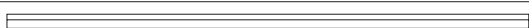
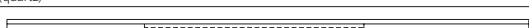
			P/N	Specification	GC-2010 Plus GC-2010	GC-2014	GC-2025	GC-17A ver. 1-3 GC-1700, GC-18A	GC-14A GC-14B	GC-8A
				Injection Unit →	SPL-2010 Plus SPL-2010	SPL-2014	SPL-2025	SPL-17	SPL-14	SPL-G9
Injection Port Side	Split/Splitless Injection Method	For Split	221-41444	 (95mm)	O	S	S	S		
			221-41444-01	 (95mm)	S		O	O		
			221-37574-01	 (99mm)					S	
			221-25822-03	 (87mm)						S
		For Splitless	221-48335-01	 (95mm)	S	S	S	O		
			221-41544	 (95mm)	O	O	O	S		
			221-75192	 (95mm, deactivated, 5 pcs)	O	O				
			221-32544	 (99mm)					S	
			221-25944-03	 (87mm)						S
		For Split and Splitless	221-75187	 (95mm, deactivated, needle onto wool, 5 pcs)	O	O				
			221-75188	 (95mm, deactivated, needle onto wool, 5 pcs)	O	O				
			221-75189	 (95mm, deactivated, needle into wool, 5 pcs)	O	O				
			221-75190	 (95mm, deactivated, 5 pcs)	O	O				
			221-75191	 (95mm, deactivated, needle into wool, 5 pcs)	O	O				
			221-75193	 (95mm, deactivated, with wool, 5 pcs)	O					
			221-75194	 (95mm, deactivated, 5 pcs)	O					
			221-41444-05	 (95mm, deactivated, 5 pcs)		O				
			221-41544-05	 (95mm, deactivated, 5 pcs)		O				
			221-75195	 (95mm, deactivated, with wool, 5 pcs)		O				
		Ddirect Injection Method (WBI)		Injection Unit →	WBI-2010 Plus WBI-2010	WBI-2014		WBI-17		
			221-41599	 (95mm)	O	O		S		
			221-48335-01	 (95mm)	S (WBI-2010)	S		O		
			221-75197	 (95mm, deactivated, with wool *2, 5 pcs)	O	O				
			221-41599-05	 (95mm, deactivated, for 0.53 mmID column, 5 pcs)		O				
		For AOC-5000 Plus	221-75196	 (95mm, deactivated, 5 pcs)	O	O				
		WBC Attachment	221-38107 *1	 (139mm)		S			S	
			221-39148	 (86mm)						S
For CLH-14	Injection Port Side	221-32998-01	 (123mm)						S	
	Detector Side	221-33000	 (71mm)						S	
For CLH-800	Injection Port Side	221-18384-04	 (78mm, for split injection method)							S
	Detector Side	221-18756-02	 (78mm)							S

*1 Required if the WBC Attachment is used for a packed column injection in GC-2014. Insert for GC-14 septum purge unit is P/N: 221-38151-04.

*2 Wool is 25 mm from the top of insert.

Glass Insert for OCI / PTV

S: Standard; O: Option

	P/N	Specification	GC-2010 / GC-2010 Plus	GC-17
Simple On-column Injection Method		Injection Unit →	OCI-2010 *1	OCI-17 *2
	221-49381-01		O	
	221-49381-02	 (deactivated)	O	
PTV Injection Method	221-42223			S
	221-49300	 (quartz)	S	
	221-74830-09	 (for AOC-MEPS™ system, deactivated, with wool, 5 pcs)	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).

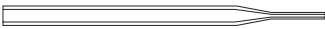
Glass Insert for Packed Column Analysis

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 3.0 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 3.0 mmID column)	S		S
	221-14093-84	 (for 3.0 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 3.0 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 (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	
	GC-2025	221-47222-91
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

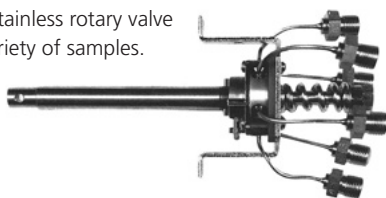
Description	P/N
25 mL	670-10458-73

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

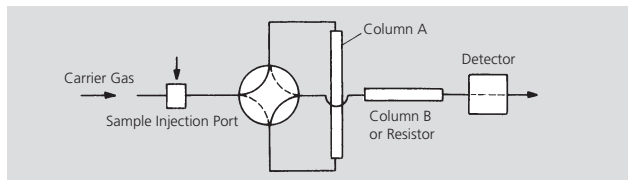
Valve / Valve Applied Device

Valve

Using a 4, 6, 8 or 10-port stainless rotary valve enables GC analysis of a variety of samples.

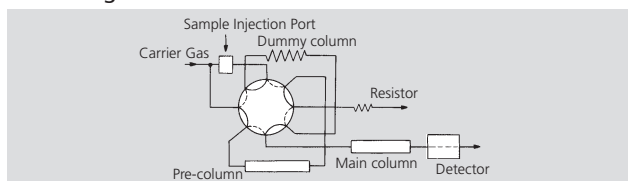


Backflushing



Using a 4-port valve to reverse the carrier gas stream allows a group of some sample components to elute as one peak.

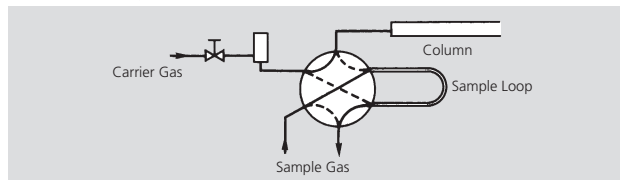
Precutting



Using an 8-port valve to reverse the carrier gas stream in the short pre-column enables avoiding the uninteresting high boiling components and water contents. This can shorten the analysis time and prevent column deterioration.

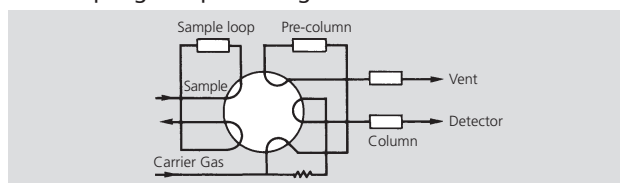
Number of Port	Manual Operation Type	For Valve Actuator	
		External Installation Type	For Valve Unit
4	201-35597-02	221-26253-96	221-26366-91
6	201-35011-05	221-26253-97	221-26366-92
8	201-35109-03	221-26253-98	221-26366-93
10	221-25500-91	221-26253-99	221-26366-94

Gas sampling



Using a 6-port valve enables introducing gas samples with high repeatability. The sample volume is determined by the capacity of the sample loop selected.

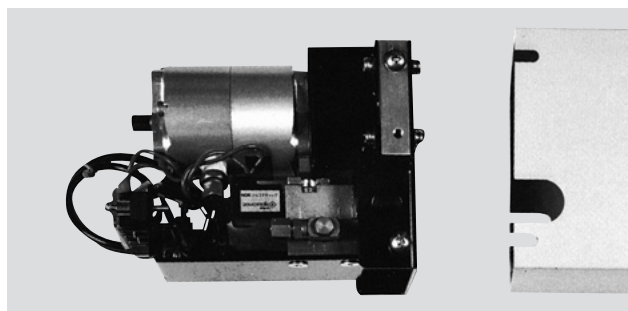
Gas sampling and precutting



One 10-port valve can provide gas sampling and precutting selectively.

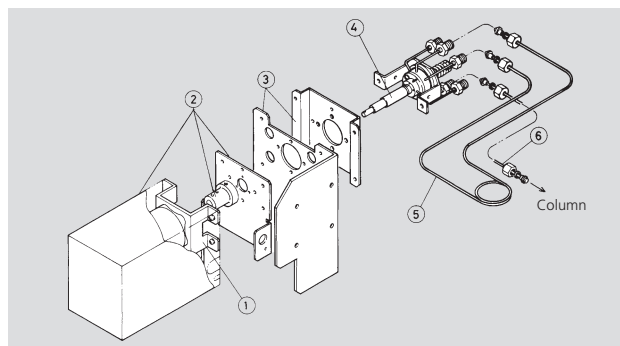
Valve Actuator VLA-1

P/N	Remarks
221-25930-91	100V



VLA-1 is a rotary air cylinder used for automated operation of valves. It is driven by compressed air and controlled by an electric signal.

VLA-1 is connected to the above external installation type manual control valve. The pneumatic force is supplied from the air cylinder for the FID via a branch pipe and an air hose.



The picture above is an example of an automatic gas sampler, assembled using the parts listed below. The assembled automatic gas sampler is installed on the outside cover of a GC oven.

Diag. #	Description	P/N	Qty
①	VLA-1 Valve Actuator	221-25930-91	1
②	Valve Actuator Case	221-26000-90	1
①+②	Valve Actuator Unit	221-26000-91	
③	Mount Plate	221-26255-91	1
④	6-port Valve, with shaft	221-26253-97	1
⑤	Pipe, MN2-MN2 L-1000	201-48555-00	2
⑥	Pipe, MN2-GN2 L-500	201-48560-50	1

Gas Sampler

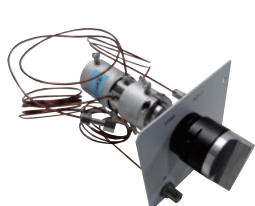
Description	P/N
MGs-2010	221-75363-41

MGs-2010 is the manual gas sampler for 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.

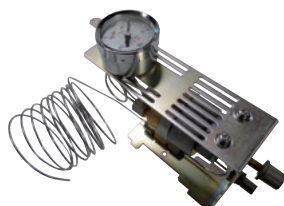
Purge Gas Flow Rate: approx. 40 mL/min

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.

Heated Gas Sampler HGS-2

P/N	221-42571
-----	-----------

HGS-2 is assembled for an oven that can maintain any temperature up to 150°C and a 6-port manual type valve. It also includes necessary pipes. HGS-2 is installed at the left side of a GC system. The following installation kit is required.

Description	P/N
Installation Kit for GC-8A	201-37173
Installation Kit for GC-9A-17A	221-08333-90



Note: For installing to GC-2010/2010 Plus and GC-2014, please contact your local Shimadzu representative.

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 GC-2010/2010 Plus, 2014, 2025, 17A ver. 2/3 and 18A.

Cryogenic Valve Unit

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

Cryogenic Work Attachment

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

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)



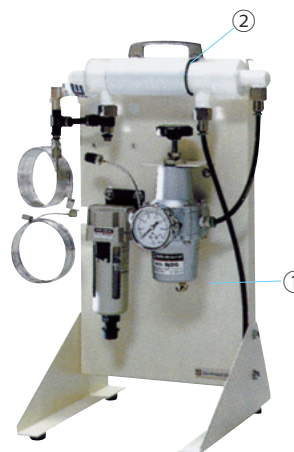
Air Dryer Unit

This unit can regulate the pressure, remove dust and dehumidify the compressed air. A silica gel type (below ①) and maintenance-free hollow fiber membrane type (below ①+②) are available.

Hollow fiber membrane is a new material that allows vapor to pass through while preventing air from passing, and there is no need to replace or re-generate.

Description	P/N	Type
① Air Filter/Regulator Unit	221-38251-91	Silica Gel
② Membrane Dryer Additional Kit *	221-51658-91	-
①+② Membrane Dryer Unit	Combination of above items	Hollow Fiber Membrane

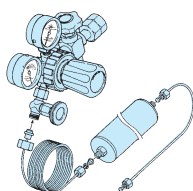
* When air supplied pressure is 300 kPa, 2L/min of air is consumed and 1L/min of dry air is supplied. By changing its pre-setting, maximum 2L/min of dry air can be supplied. In this case, 4L/min of air would be consumed.



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



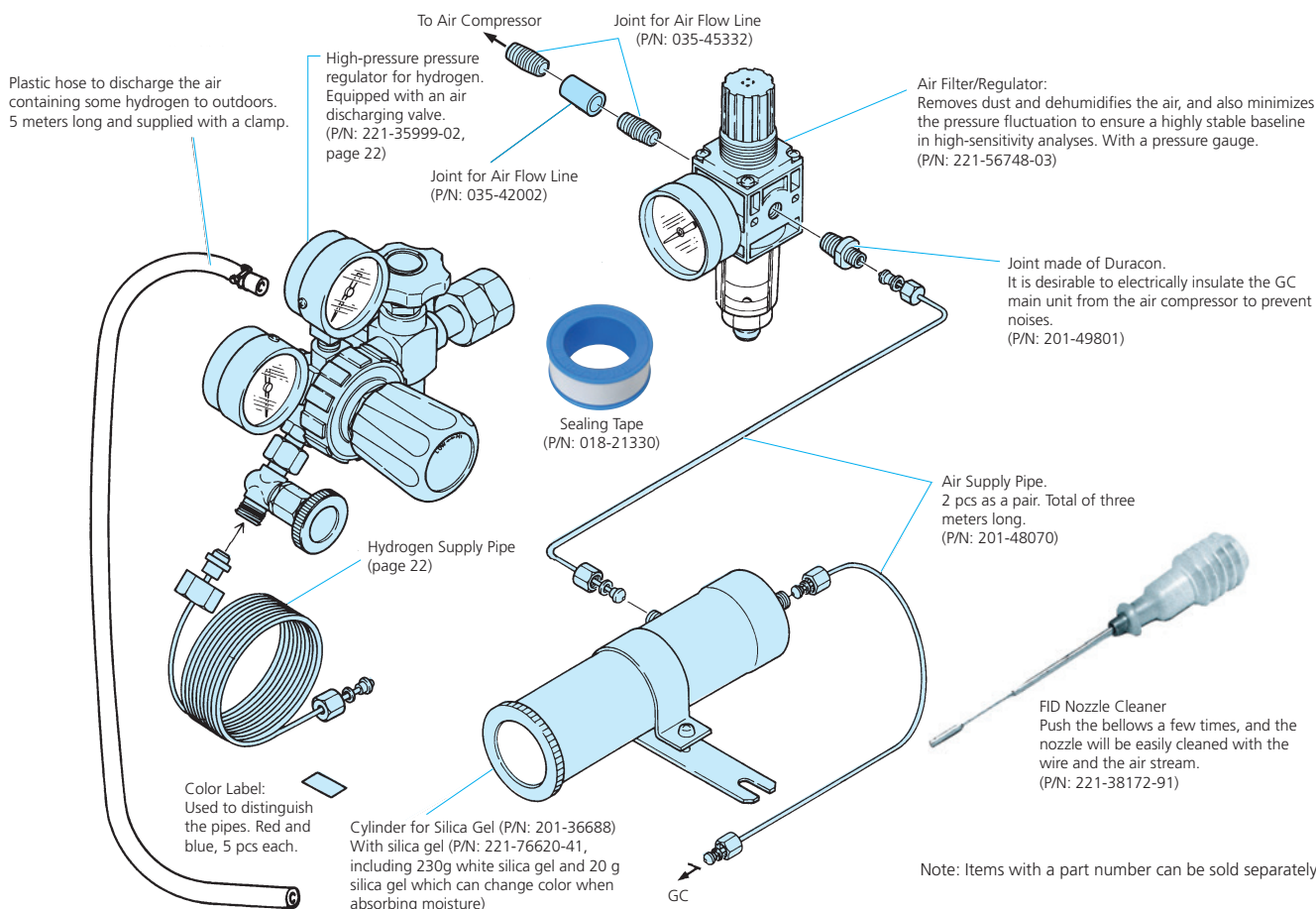
The standard set includes a carrier gas supply pipe, a gas filter, leak check fluid, tools, a pocket timer, a mirror for flame checking, a microliter syringe, column tags, quartz beads, color markers, a power outlet, and a case.



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 22) for high-purity air. It is also recommended to use those items if high-sensitivity analysis is performed by FID and FPD.



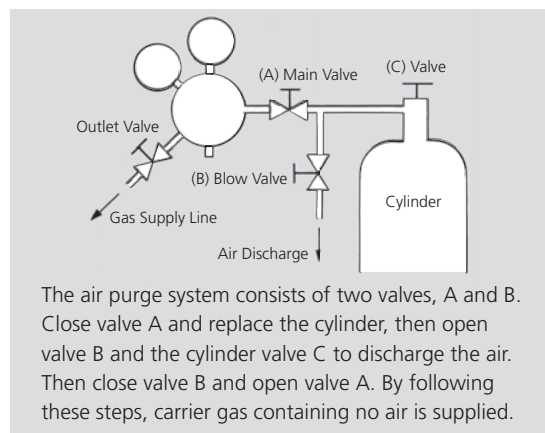
Pressure Regulator for High-Purity Gas (PPR Series)

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 GC-2010 Plus or other GCs applicable to high-sensitivity analysis. An additional gas filter will increase the purity of supply gas (Please refer to page 23).

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.

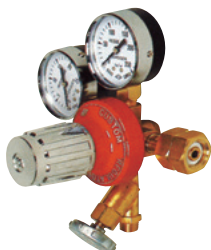
Description	P/N	Joint Type at Pressure Regulator Side	Joint Type at GC side
Gas Supply Pipe	2.5m	201-48067	Right-hand Thread
	5m	201-48067-05	
	10m	201-48067-10	
	15m	201-48067-15	
Hydrogen Supply Pipe	2.5m	221-18990-25	Left-hand Thread
	5m	221-18990-50	
	10m	221-18990-00	
Hydrogen Supply Pipe	2.5m	221-73474-25	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 (Please refer to page 23).

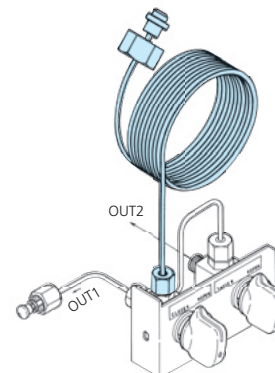
Note: Not applicable to GC-2010 Plus and high-sensitivity analysis.



Branch Valve

P/N	221-33973-92
-----	--------------

Branch Valve is useful when carrier gas is supplied to two GCs from one gas cylinder. Gas supply pipes are not included.



Digital Flow Meter DFM-1000

P/N	080-68520-01
-----	--------------

DFM-1000 is a digital gas flow meter that requires no stopwatch. After connecting its rubber tube with the outlet of a gas line, the measured value will be shown in the panel immediately. The speed of a gas bubble is timed with a photo sensor, and the result is converted into a flow rate by a microcomputer and displayed on a three-digit meter. It is also capable of displaying split ratios in capillary GC.

Specifications

Measuring Range	0.1 - 1000 mL/min
Temperature Range	0 - 45°C
Precision	±3%
Power Source	Dry cell, 9V
Dimensions	W100 × D190 × H60 mm (excluding the stand)
Weight	400 g



Fluid for Leak Check

P/N	670-11514
-----	-----------

Since the fluid volatilizes rapidly, it remains nothing after use. The nozzle can be pulled out to a length of 30 cm, which makes it possible to check the leakage at the innermost position in a narrow space. (240 mL/bottle)



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).

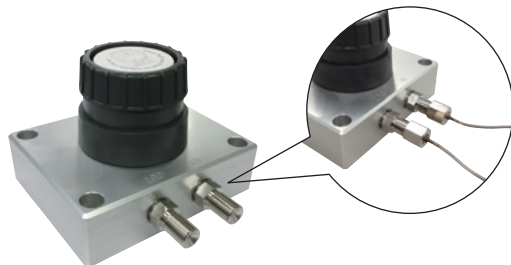


Shimadzu Gas Filter Kit for GC-FID/FPD



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.



M type connector can be connected directly to the Shimadzu gas supply pipe.

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.

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



Installing the filter

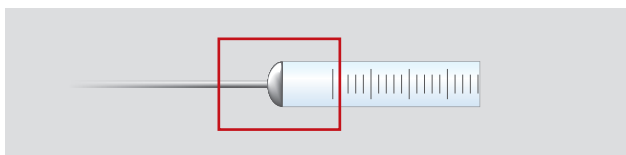
Syringe

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.

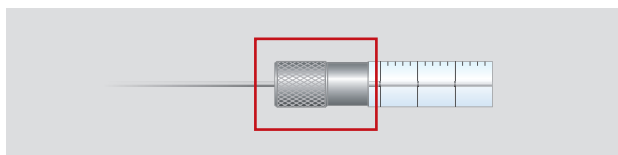
Syringe Style

Fixed Needle



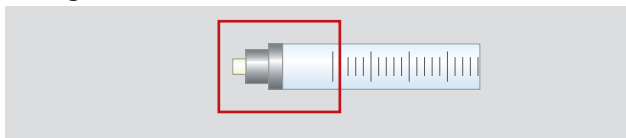
- Better option for experienced users or for applications requiring trace sample levels
- Recommended for use with an autosampler because the probability of needle bending is minimal
- Minimal sample carryover

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

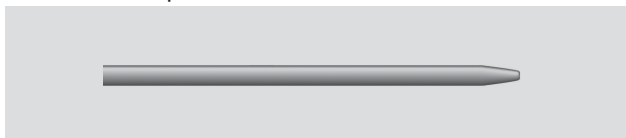
Gas Tight



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

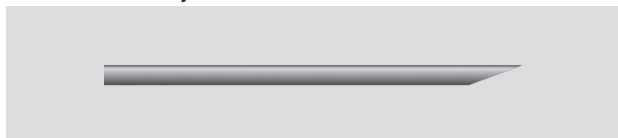
Needle Tip Style

Cone: Autosampler



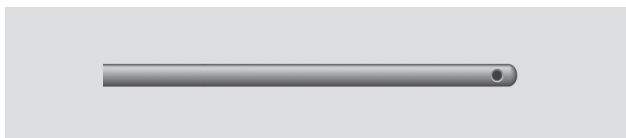
The cone-shaped needle tip is specially developed to withstand multi injection demands and improve septum lifetime when used with an autosampler. The cone design effectively “parts” the septum during piercing instead of cutting it, as would a bevel needle.

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.

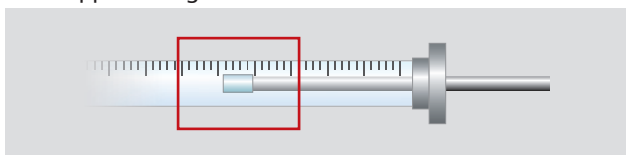
Side Hole Dome



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.

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 27 and 28.

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 Plus

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

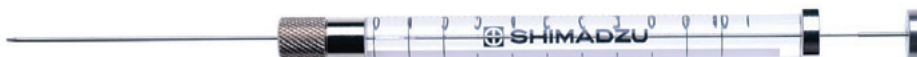
Manual Syringe

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	-	

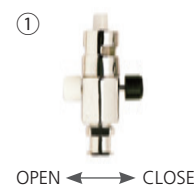
Syringe for Gas Analysis

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 μ L	670-12510-95 (5 pcs)
5R-GPS	670-12510-86	5 μ L	670-12510-94 (5 pcs)



Gastight Seal Style Microsyringe

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

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



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 μ L. 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 μ L	Fixed Needle
MS-E10-CS	670-12580-22	10 μ L	
MS-NE05-CS	670-12580-25	5 μ L	670-12580-31 (5 pcs)
MS-NE10-CS	670-12580-26	10 μ L	



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.

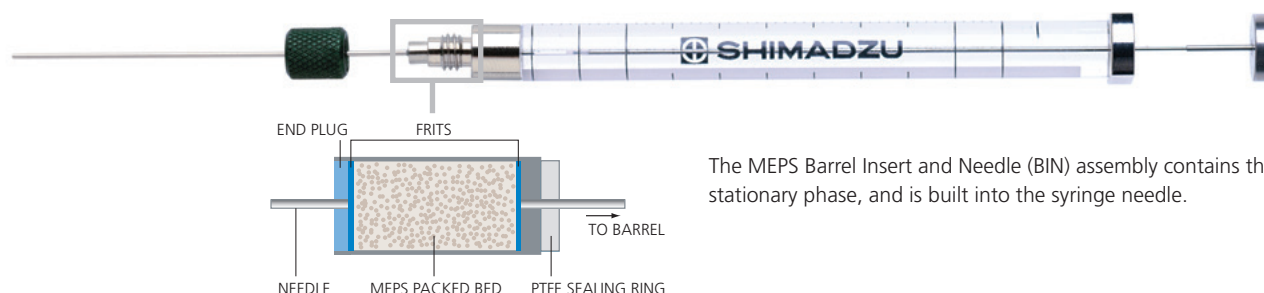
Description	P/N	Syringe Volume	Replacement Needle P/N
MS-G10	670-12504-25	10 μ L	Fixed Needle
MS-NG10	670-12504-22	10 μ L	670-12504-86 (5 pcs)



Micro Solid Phase Extraction Syringe MEPS™

MEPS™ is Micro Extraction by Packed Sorbent and is used for sample preparation and handling. MEPS is the miniaturization of conventional SPE packed bed devices from milliliter bed volumes to microliter volumes. The MEPS approach to sample preparation is suitable for reversed phases, normal phases, mixed mode or ion exchange chemistries. MEPS is available in a variety of common SPE phases.

MEPS BARREL INSERT AND NEEDLE



The MEPS Barrel Insert and Needle (BIN) assembly contains the stationary phase, and is built into the syringe needle.

SAMPLE SIZE AND SENSITIVITY

Sample volumes may be as little as 10 μL , or by taking multiple aliquots of 100 μL or 250 μL , samples of 1 mL or larger may be concentrated.

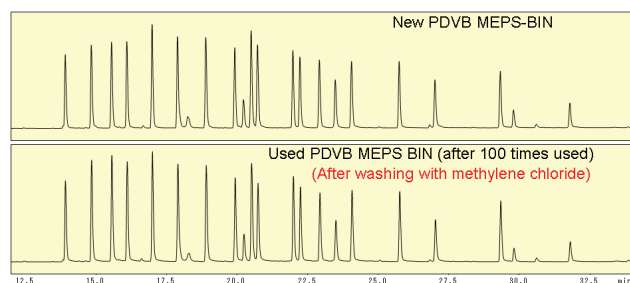
AUTOMATION

Extract samples and make injections on-line using a single device, reducing sample processing times and the need for operator intervention.

SORBENT LIFE

BIN life is dependent on the specific matrix being analyzed. For example, C18 analysis of whole plasma samples is conservatively 25-100 samples before the BIN needs to be changed. BIN life of cleaner samples is significantly longer.

Chromatogram of 22 pesticides standard solution (40 ng/mL)



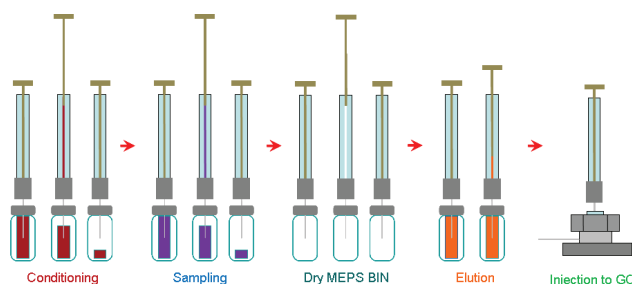
CARRYOVER

The small quantity of phase in the MEPS BIN is easily and effectively washed between samples to reduce the possibility of carryover. This washing process is not practical with off-line SPE devices. With automated MEPS, washing occurs while the previous sample is running.

FLEXIBLE AND EASY TO USE

The dimensions of the sorbent bed ensure performance remains identical to conventional SPE devices when used for extraction of similar samples. The AOC-MEPS system was developed to incorporate MEPS into a process automation workflow, combining sample preparation and analysis in a single platform.

AOC-MEPS System



When automated by an AOC-MEPS system, the injection volume is much larger compared to the commonly used GC injection volumes of 1 - 2 μL . With AOC-MEPS, the typical injections are 50 to 200 μL of elution solvent.

A large volume injection technique that removes the solvent volume from inside the injector unit while condensing the target compounds should be employed.

MEPS™ Syringe for AOC-20i/20s

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

Phase	Qty	P/N for 100 µL syringe	P/N for 250 µL 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



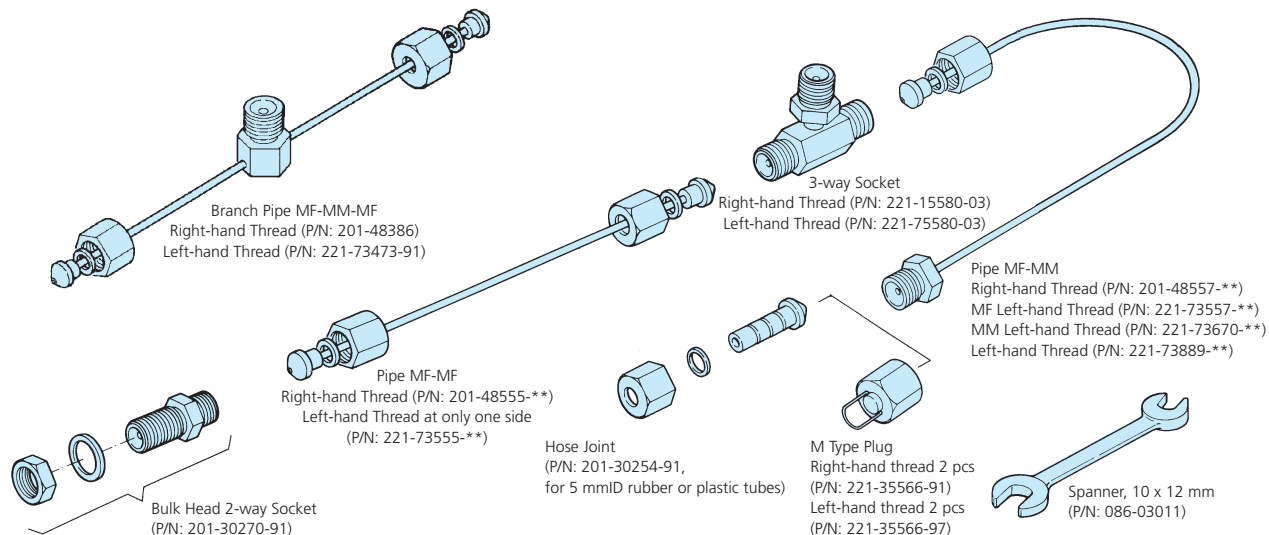
AOC-20i + GC-2010 + PTV configuration

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

Parts for Tubing

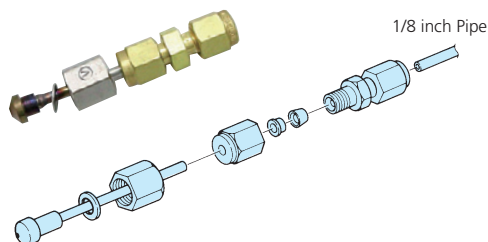
Shimadzu M Type Joint

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.



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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