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Thermo Scientific

TRACE 1300 and TRACE 1310

Spare Parts Guide

Gas Chromatographs

31715004 Revision M July 2022

ThermoFisher SCIENTIFIC

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General Lab Equipment. Not for Clinical, Patient, or Diagnostic Use.

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Declaration

Manufacturer: **Thermo Fisher Scientific**

Thermo Fisher Scientific is the manufacturer of the instrument described in this manual and, as such, is responsible for the instrument safety, reliability and performance only if:

- installation
- re-calibration
- changes and repairs

have been carried out by authorized personnel and if:

- the local installation complies with local law regulations
- the instrument is used according to the instructions provided and if its operation is only entrusted to qualified trained personnel

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Regulatory Compliance

Thermo Fisher Scientific performs complete testing and evaluation of its products to ensure full compliance with applicable domestic and international regulations. When the system is delivered to you, it meets all pertinent electromagnetic compatibility (EMC) and safety standards.

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The world leader in serving science

DECLARATION OF CONFORMITY
Dichiarazione di Conformità
according to ISO/IEC Guide 17050-1

Manufacturer's Name : **Thermo Fisher Scientific SpA.**

Manufacturer's Address : Strada Rivoltana
20090 Rodano - Milan
Italy

declares, under sole responsibility, that the product
dichiara ,sotto la sua piena responsabilità, che il prodotto

Product : Gas Chromatographs

Product model: Trace 1300 Series

as originally delivered complies with the essential requirements of the following applicable European Directives
così come originariamente consegnato, risponde ai requisiti essenziali delle seguenti Direttive Europee applicabili

Machinery Directive 2006/42/EC
EMC Directive 2014/30/EU
RoHS Directive 2011/65/EU

and conforms with the following product standards
ed è conforme ai seguenti standard di prodotto

EMC: EN 61326-1:2013 (2ª ed.)
IEC 61326-1:2012 (2nd ed.)
FCC rules: CFR no. 47 Part 15 Subpart B Section 15.107 and 15.109

Safety: EN 61010-1:2010 (3ª ed.)
IEC 61010-1:2010 (3rd ed.)
CAN/CSA C22.2 No. 61010-1-12
UL 61010-1:2012

person authorised to compile the technical file **Thermo Fisher Scientific SpA.**
persona autorizzata a costituire il fascicolo tecnico

General Manager GC/GCMS: Morten Bern

Place: **Milan, Italy**
Date: **April 12, 2017 (5th rev.)**

original copy

IMPORTANT: Class A equipment is intended for use in an industrial environment. In others environments there may be potential difficulties in ensuring electromagnetic compatibility, due to the conducted as well as radiated disturbances.

FCC Compliance Statement

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

CAUTION Read and understand the various precautionary notes, signs, and symbols contained inside this manual pertaining to the safe use and operation of this product before using the device.

Notice on Lifting and Handling of Thermo Scientific Instruments

For your safety, and in compliance with international regulations, the physical handling of this Thermo Fisher Scientific instrument ***requires a team effort*** to lift and/or move the instrument. This instrument is too heavy and/or bulky for one person alone to handle safely.

Notice on the Proper Use of Thermo Scientific Instruments

In compliance with international regulations: Use of this instrument in a manner not specified by Thermo Fisher Scientific could impair any protection provided by the instrument.

Notice on the Susceptibility to Electromagnetic Transmissions

Do not use radio frequency transmitters, such as mobile phones, in close proximity to the instrument.

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China EEP Hazardous Substances Information

产品中有害物质的名称及含量
China EEP Hazardous Substances Information

部件名称 Component Name	有害物质 Hazardous Substances (TRACE 13x0)					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
(主机:背部接线电路板) Base Unit: PCBA BACKPLANE	X	O	O	O	O	O
(主机：炉箱电路板) Base Unit: PCBA OVEN CPU	X	O	O	O	O	O
(主机: 主控电路板) Base Unit: PCBA CPU	X	O	O	O	O	O
(主机：存储器电路板) Base Unit: PCBA MEMORY	X	O	O	O	O	O
(主机：接口电路板) Base Unit: PCBA EXTERNAL INTERFACE	X	O	O	O	O	O
(主机：电源供应电路板) Base Unit: PCBA POWER SUPPLY	X	O	O	O	O	O
(主机：显示屏控制电路板) Base Unit: PCBA RSR798	X	O	O	O	O	O
(主机：液晶显示屏) Base Unit: DISPLAY LCD	X	O	O	O	O	O
(分流/不分流进样器电路板) PCBA's MODULE SSL	X	O	O	O	O	O
(程序升温进样器电路板) PCBA's MODULE PTV	X	O	O	O	O	O
(火焰离子化检测器电路板) PCBA's MODULE FID	X	O	O	O	O	O
(电导检测器电路板) PCBA's MODULE ECD	X	O	O	O	O	O
(氮磷检测器电路板) PCBA's MODULE NPD	X	O	O	O	O	O
(热导检测器电路板) PCBA's MODULE TCD	X	O	O	O	O	O
(火焰光度检测器电路板) PCBA's MODULE FPD	X	O	O	O	O	O
(辅助温度模块电路板)PCBA's MODULE AUXILIARY TEMPERATURE	X	O	O	O	O	O
(辅助气体模块电路板) PCBA MODULE AUXILIARY GASES	X	O	O	O	O	O
(模拟输出接口电路板) PCBA MODULE AOI	X	O	O	O	O	O
(脉冲放电检测器电路板) PCBA's MODULE PDD	X	O	O	O	O	O
(通用检测器接口电路板) PCBA MODULE GDI	X	O	O	O	O	O
(辅助炉箱电路板) PCBA's AUXILIARY OVEN	X	O	O	O	O	O
(机加工件) MACHINED PARTS	O	O	O	O	O	O
(模具) MOLDED PARTS	O	O	O	O	O	O
(钣金件) SHEETMETAL PARTS	O	O	O	O	O	O
(电机组件) ELECTROMECHANICAL ASSEMBLIES	O	O	O	O	O	O
(电缆组件) CABLE ASSEMBLIES	O	O	O	O	O	O
(标签) LABELS	O	O	O	O	O	O

本表格依据SJ/T11364的规定编制 This table is compiled according to SJ/T 11364 standard.

O: 表示该有害物质在该部件所有均质材料中的含量均在GB/T26572规定的限量要求以下.
Indicates that the concentration of the hazardous substance in all homogeneous materials for the part is below the relevant threshold of the GB/T 26572 standard.

X: 表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T26572规定的限量要.
Indicates that the concentration of the hazardous substance in at least one homogenous material of the part is above the relevant threshold of the GB/T 26572 standard.

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WEEE Directive

2012/19/EU

Thermo Fisher Scientific has contracted with one or more recycling or disposal companies in each European Union (EU) Member State, and these companies should dispose of or recycle this product. See www.thermoscientific.com/rohsweee for further information on Thermo Fisher Scientific's compliance with these Directives and the recyclers in your country.

Directive DEEE

2012/19/EU

Thermo Fisher Scientific s'est associé avec une ou plusieurs compagnies de recyclage dans chaque état membre de l'union européenne et ce produit devrait être collecté ou recyclé par celles-ci. Davantage d'informations sur la conformité de Thermo Fisher Scientific à ces directives, les recycleurs dans votre pays et les informations sur les produits Thermo Fisher Scientific qui peuvent aider la détection des substances sujettes à la directive RoHS sont disponibles sur www.thermoscientific.com/rohsweee.

WEEE Direktive

2012/19/EU

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Preface

This guide contains detailed information about ordering spare parts for the Thermo Scientific™ TRACE™ 1300 and TRACE™ 1310 GC.

About Your System

Thermo Scientific systems provide high-caliber gas chromatography (GC) instrumentation. Your TRACE 1300/TRACE 1310 GC system can be a stand-alone unit or coupled with other instruments.

GC represents a powerful analytical separation technique. Complex mixtures of individual compounds can be injected into the GC, either manually or by using an autosampler, and then separated the eluate for presentation to the detector. The detector generates signals of the GC eluate and its components. These signals are then processed by a Thermo Scientific Chromatography Data System for qualitative identification, as well as accurate and precise quantification of the individual compounds present in the sample.

IMPORTANT Thermo Scientific systems optimize the separation and detection capabilities of GC by providing high performance analytical capabilities for both research, and routine applications. More information about the use of this system can be found in related documentation sources, and by using the provided contact information.

WARNING Thermo Scientific systems operate safely and reliably under carefully controlled environmental conditions. If the equipment is used in a manner not specified by the manufacturer, the protections provided by the equipment might be impaired. If you maintain a system outside the specifications listed in this guide, failures of many types, including personal injury or death, might occur. The repair of instrument failures caused by operation in a manner not specified by the manufacturer is specifically excluded from the standard warranty and service contract coverage.

WARNING Operation of this system requires the use of chemical substances with different hazard specifications. Before using any chemicals, read the hazard indications and information reported in the Safety Sheet supplied by the manufacturer, referring to the relevant CAS (Chemical Abstract Service) number.

Power Rating

TRACE 1300/TRACE 1310 gas chromatograph
- 120 Vac ±10%,50/60 Hz, 2000 VA
- 230 Vac ±10%, 50/60 Hz, 2000 VA

Detailed instrument specifications are in the Product Specifications or Product Brochure.

Contacting Us

There are several ways to contact Thermo Fisher Scientific for the information you need.

❖ **To find out more about our products**

Go to http://www.thermofisher.com for information about our products.

❖ **To get local contact information for sales or service**

Go to http://www.unitylabservice.com/en/home.html

Related Documentation

In addition to this guide, Thermo Scientific provides the following documents for the TRACE 1300 and TRACE 1310 gas chromatographs.

TRACE 1300 and TRACE 1310 Document Set, PN 31715000
- *TRACE 1300 and TRACE 1310 Preinstallation Requirements Guide,* PN 31715001
- *TRACE 1300 and TRACE 1310 Hardware Manual*, PN 31715002
- *TRACE 1300 and TRACE 1310 User Guide,* PN 31715003
- *TRACE 1300 and TRACE 1310 Spare Parts Guide*, PN 31715004

Safety Alerts and Important Information

Make sure you follow the precautionary notices presented in this manual. The safety and other special notices appear in boxes.

Special Notices

Notices includes the following:

IMPORTANT Highlights information necessary to prevent damage to software, loss of data, or invalid test results; or might contain information that is critical for optimal performance of the system.

Note Emphasizes important information about a task.

Tip Helpful information that can make a task easier.

Safety Symbols and Signal Words

All safety symbols are followed by **WARNING** or **CAUTION**, which indicates the degree of risk for personal injury, instrument damage, or both. Cautions and warnings are following by a descriptor, such as **BURN HAZARD**. A **WARNING** is intended to prevent improper actions that could cause personal injury. Whereas, a **CAUTION** is intended to prevent improper actions that might cause personal injury, instrument damage, or both. You can find the following safety symbols on your instrument or in this manual:

Symbol	Descriptor
	BIOHAZARD: Indicates that a biohazard *will*, *could*, or *might* occur.
	BURN HAZARD: Alerts you to the presence of a hot surface that *could* or *might* cause burn injuries.
	ELECTRICAL SHOCK HAZARD: Indicates that an electrical shock *could* or *might* occur.
	FIRE HAZARD: Indicates a risk of fire or flammability *could* or *might* occur.
	EXPLOSION HAZARD. Indicates an explosion hazard. This symbol indicates this risk *could* or *might* cause physical injury.
	FLAMMABLE GAS HAZARD. Alerts you to gases that are compressed, liquefied or dissolved under pressure and can ignite on contact with an ignition source. This symbol indicates this risk *could* or *might* cause physical injury.
	GLOVES REQUIRED: Indicates that you must wear gloves when performing a task or physical injury *could* or *might* occur.
	CLOTHING REQUIRED. Indicates that you should wear a work clothing when performing a task or else physical injury *could* or *might* occur.
	BOOTS REQUIRED. Indicates that you must wear boots when performing a task or else physical injury *could* or *might* occur.
	MATERIAL AND EYE HAZARD. Indicates you must wear eye protection when performing a task.
	HAND AND CHEMICAL HAZARD: Indicates that chemical damage or physical injury *could* or *might* occur.

	HARMFUL. Indicates that the presence of harmful material *will, could, or might* occur.
	INSTRUMENT DAMAGE: Indicates that damage to the instrument or component *might* occur. This damage might not be covered under the standard warranty.
	LIFTING HAZARD. Indicates that a physical injury *could* or *might* occur if two or more people do not lift an object.
	MATERIAL AND EYE HAZARD: Indicates that eye damage *could* or *might* occur.
	READ MANUAL: Alerts you to carefully read your instrument's documentation to ensure your safety and the instrument's operational ability. Failing to carefully read the documentation *could* or *might* put you at risk for a physical injury.
	TOXIC SUBSTANCES HAZARD: Indicates that exposure to a toxic substance could occur and that exposure *could* or *might* cause personal injury or death.
	LASER HAZARD. Indicates that exposure to a laser beam *will*, *could*, or *might* cause personal injury.
	RADIOACTIVE HAZARD. Indicates that the presence of radioactive material *could or might* occur.
	For the prevention of personal injury, this general warning symbol precedes the **WARNING** safety alert word and meets the ISO 3864-2 standard. In the vocabulary of ANSI Z535 signs, this symbol indicates a possible personal injury hazard exists if the instrument is improperly used or if unsafe actions occur. This symbol and another appropriate safety symbol alerts you to an imminent or potential hazard that *could cause personal injury*.

Instrument Markings and Symbols

Table 1 explains the symbols used on Thermo Scientific instruments. Only a few of them are used on the TRACE 1300/1310, which are annotated with an asterisk below.

Table 1. Instrument Marking and Symbols (Sheet 1 of 2)

	Symbol	Description
	⎓	Direct Current
*	∼	Alternating Current
	≂	Both direct and alternating current
	3∼	Three-phase alternating current

Table 1. Instrument Marking and Symbols (Sheet 2 of 2)

	Symbol	Description
		Earth (ground) terminal
		Protective conductor terminal
		Frame or chassis terminal
		Equipotentiality
*		On (Supply)
*		Off (Supply)
		Equipment protected throughout by DOUBLE INSULATION or REINFORCED INSULATION (Equivalent to Class II of IEC 536)
*		Instruction manual symbol affixed to product. Indicates that the user must refer to the manual for specific **WARNING** or **CAUTION** information to avoid personal injury or damage to the product.
		Caution, risk of electric shock
*		Caution, hot surface
*		Caution, biohazard
		In-position of a bistable push control
		Out-position of a bistable push control
*		Jack socket
*		Symbol in compliance to the Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE) placed on the European market after August, 13, 2005.

Hydrogen Safety Precautions

Hydrogen is a colorless, odorless, highly flammable gas with the molecular formula H_2 and an atomic weight of 1.00794, making it the lightest element. Hydrogen gas presents a hazard, as it is combustible over a wide range of concentrations; at ambient temperature and pressure, the range is from about 4 to 74.2% by volume.

Hydrogen has a flash point of - 423 °F (- 253 °C) and an auto-ignition temperature of 1040 °F (560 °C). It has a very low ignition energy and the highest burning velocity of any gas. If hydrogen is allowed to expand rapidly from high pressure, it can self-ignite. Hydrogen burns with a flame that can be invisible in bright light.

WARNING - EXPLOSION HAZARD The use of hydrogen as a carrier gas is dangerous. Hydrogen is potentially explosive and must be used with extreme care. Any use of hydrogen gas must be reviewed by appropriate health and safety staff, and all installations of hydrogen systems must be performed to applicable codes and standards. Thermo Fisher Scientific assumes no liability for the improper use of hydrogen as a carrier gas.

Before you begin using hydrogen, conduct a risk assessment based on the quantity of hydrogen to be used and the conditions of your laboratory. Ask yourself:

"What hydrogen hazards associated with this project are most likely to occur?"

"What hydrogen hazards associated with this project have the potential to result in the worst consequences?"

- Try to reduce or eliminate the higher risks by using the proper ventilation to remove hydrogen gas before an ignitable concentration can accumulate. Also consider purging the hydrogen to further reduce hazards and ensure that anyone working with hydrogen has basic hydrogen safety training.
- As with laboratory safety in general, be sure to wear safety glasses, laboratory coats, gloves, and so on. Typically there are no specific requirements for gaseous hydrogen, other than eye protection when working with a compressed gas. If working with liquid (cryogenic) hydrogen, wear insulated gloves and protective shoes in addition to eye protection.
- Post "No Smoking" and "No Open Flames" signs to identify hydrogen sources and cylinders. Maintain, inspect, and leak-test all hydrogen sources regularly.
- Clearly mark all hydrogen shutoff valves and label permanent hydrogen piping as such at the supply or discharge point and at regular intervals along its length. Where hydrogen gas piping passes through a wall, be sure to label both sides of the wall.
- Have contingency plans in place should an incident occur.
- Ensure that site emergency response team, as well as the local fire department, knows the location of all hydrogen storage tanks.

Using Hydrogen with TRACE 1300/TRACE 1310

The use of hydrogen as a carrier gas, or as fuel gas for certain flame detectors, requires strict attention and compliance with special precautions due to the hazards involved.

WARNING - EXPLOSION HAZARD Hydrogen is a dangerous gas that, when mixed with air, could create an explosive mixture. The use of hydrogen as a carrier gas requires extreme caution. Special precautions must be taken because of the risk of explosion. When hydrogen is used as carrier gas the gas chromatograph must be equipped with a hydrogen sensor.

Never use hydrogen as carrier gas in your TRACE 1300/TRACE 1310 system unless your oven has a hydrogen sensor installed. Thermo Fisher Scientific FSEs are not authorized to install or repair any instrument using hydrogen as a carrier gas unless the instrument is equipped with the appropriate sensor.

If your oven does not have a hydrogen sensor already installed, contact your Thermo Fisher Scientific sales representative. To comply with instrument safety requirements, a Thermo Fisher Scientific FSE or authorized service personnel should install the sensor into your TRACE 1300/TRACE 1310.

Hydrogen is a dangerous gas, particularly in an enclosed area when it reaches a concentration corresponding to its lower explosion level (4% in volume). An explosion hazard could develop in the oven when hydrogen is used as a carrier gas in the case oven elements are not perfectly connected to each other, or when the connection materials are worn out, broken, or otherwise faulty.

Use the following safety precautions when using hydrogen:

- Ensure that all hydrogen cylinders comply with the safety requirements for proper use and storage. Hydrogen cylinders and delivery systems must comply with local regulations.
- Make sure the gas supply is turned completely off when connecting hydrogen lines.
- Perform a leak test to ensure that the hydrogen lines are leak-tight before using the instrument. Repeat this test to eliminate all leaks.
- Ensure your TRACE 1300/TRACE 1310 has a Thermo Scientific hydrogen sensor installed for continuously monitoring the hydrogen level in the oven.

Hydrogen Connection Guidelines

Use the following guidelines to safely connect hydrogen to your system:

- **Piping**—Hydrogen must be delivered to equipment using appropriate piping and be done in such a way as to pose essentially no hazard to end-users. Piping systems for the delivery of hydrogen should be designed and installed by a person qualified by specific training and experience with hydrogen piping systems.

  Stainless steel is usually recommended because it is a safe, cost-effective material. Piping of *black iron* or copper must not be used, as the pipe can become brittle with age. Elastomeric/plastic tubing of various plastics and polymers should not be used, unless the

tubing is approved for use with hydrogen. If elastomeric/plastic tubing is used for hydrogen gas delivery, the tubing should be tested for hydrogen permeability to minimize leakage.

The hydrogen piping system must be flexible enough to endure routine thermal expansion and contraction. The system should also include considerations for the most severe condition of temperature and pressure expected during service. Piping and supports must be able to withstand static loading introduced by such things as ice and snow; and dynamic loading from high wind and earthquake.

Caution should be used if burying hydrogen piping. Proper controls should be used to protect against damage and corrosion, and also to prevent Hydrogen from entering a building if there is any leakage.

- **Fittings**—All fittings must be of the proper type approved or designed for use with hydrogen gas. Use as few fittings as possible to minimize the potential for leaks. After installation, ensure that leak testing is carried out prior to system use, and on a regular basis.

  There must be no PTFE tape or other things like *plumber's putty* used to enhance a seal, as this actually is a detriment to a good seal. Ideally the best installation would use stainless steel tubing with appropriate gas-tight fittings.

  Welding is usually preferred for joints in hydrogen piping systems since welding provides a better connection and reduces the potential for leaks compared to mechanical fittings. Soft solder joints are not permitted for hydrogen systems (due to the low melting point of soft solder and its potential for brittle failure at cryogenic temperatures). Brazed joints are permitted, but such joints should be protected against the possibility of external fire.

  Tubing connections should be clamped to barbed or press-fit type connections. Hose clamps or *jubilee clamps* must not be used.

- **Valves**—All valves must be suitable for hydrogen service and for the specific operating conditions. Valves, including regulators, must not be used for hydrogen, unless they are designed and identified for such a use. Ball valves are often chosen because of their superior leak tightness through the valve seat. Pneumatic operators are usually chosen for remotely operated valves so that potential ignition sources (electricity) are remote from the valve.

  Manual shutoff valves should be provided near each point of use, within immediate reach. If a hydrogen cylinder or hydrogen generation system is located within immediate reach, a separate point-of-use shutoff valve is usually not necessary.

  Line regulators that have their source away from the point of use should have a manual shutoff valve near the point of use.

  An emergency gas shutoff device in an accessible location outside the use area should be provided in addition to the manual point-of-use valve in each educational and instructional laboratory space that has a piped gas supply system.

If necessary, the piping system should have uninterruptible pressure relief. The pressure relief system should be designed to provide a discharge rate sufficient to avoid further pressure increase and should vent to a safe location outside or to a ventilation system exhaust.

Purchasing Hydrogen

Use the following guidelines when purchasing hydrogen:

- Hydrogen Generator—Because it minimizes the amount of hydrogen present and reduces the degree of hazard, a hydrogen generator (also called an electrolyzer) is the safest way to purchase hydrogen in the quantity used in gas chromatography/mass spectroscopy systems.

  However, to minimize the degree of hazard, operate the hydrogen generator only in a non-explosive environment because hydrogen buildup can be ignitable. Thus, your ventilation system for the room or lab hood where the hydrogen generator operates must maintain an air exchange rate at least two orders of magnitude greater than the maximum hydrogen production rate of the hydrogen generator. Follow the manufacturers' directions about proper use and maintenance of the regulator.

  To prevent the possibility of releasing hydrogen, set the hydrogen generator to shut down if:

  – There is a loss of flow to the ventilation system

  – A hydrogen detector alarms at 25% of the lower flammable limit of hydrogen in air.

  Vent the oxygen exhausted by the electrolyzer to the outside as well.

- Hydrogen Cylinder—Hydrogen can be delivered in standard laboratory gas bottles or cylinders. These cylinders have a limited amount of hydrogen in them and are a safe way to transport and store hydrogen. Always secure, compressed hydrogen gas cylinders, like all compressed gas cylinders, in an upright position, ideally with a non-combustible chain or cable. If the cylinder falls over, the valve can fall off, causing the pressurized cylinder to take off like a rocket, leading to the release of hydrogen and possibly an explosion, severe injury, or death. Never crack a hydrogen cylinder valve to remove dust or dirt from fittings prior to attaching a regulator, as there is a risk of self-ignition.

Properly Storing Hydrogen

Storing and handling compressed hydrogen gas and cryogenic liquid hydrogen present potential health and safety hazards. Using proper storage and handling techniques is essential to maintaining a safe work environment.

Use the following guidelines when storing hydrogen:

- Store spare hydrogen gas cylinders outside and away from doors, windows, building air intake vents, structures, and vehicle routes. This precaution applies when the hydrogen is or is not in use. Indoor storage of spare hydrogen cylinders has special requirements, which are beyond the scope of this document. Documentation for each vessel should include a description of the vessel, a list of available drawings or other documents, the most recent inspection results, and the responsible person's name.
- Prevent spare cylinders from toppling by wrapping them with chains. The chains should also be protected against corrosion and excessive heat.
- Separate spare hydrogen cylinders from oxidizing gases (such as oxygen) with a 5 ft. (1.5 m) tall fire barrier with a half-hour fire rating or place the cylinders at least 20 ft. (6 m) apart.
- When moving hydrogen cylinders:
  - Remove the regulator and replace the cylinder valve cap before moving.
  - Move cylinders on cylinder carts or with other appropriate transport devices.
  - Never roll or drop a cylinder and never lift a cylinder by its protective cap.
- Bulk hydrogen systems include either gaseous or liquid hydrogen in fixed installations; in some gas systems a semi-permanent trailer (tube trailer) can be used. Storage vessels for compressed hydrogen gas or liquid hydrogen should be designed, constructed, tested, and maintained in accordance with applicable codes and standards. Bulk hydrogen systems represent a level of complexity again which is beyond the scope of this document; however some general guidelines are provided.
- The bulk hydrogen storage system should not be located beneath electric power lines, close to other flammable gases/liquids, or close to public areas. It should be readily accessible to authorized personnel and delivery equipment, but protected from physical damage or tampering.
- As liquid hydrogen systems also have a cryogenic hazard, additional safety considerations for the use of cryogenic liquids might be necessary.

Hydrogen Safety Codes, Standards and References

The following list of safety codes, standards, and references is in no way an exhaustive list. In fact, there may be federal, state, or local codes that apply to your specific location. Check with all appropriate agencies with jurisdiction before installing or using a hydrogen system.

- Air Products Safetygram #4 Gaseous Hydrogen
- ANSI/AIAA standard for hydrogen safety guidelines is AIAA G-095-2004, Guide to Safety of Hydrogen and Hydrogen Systems
- ASME B31.1, Power Piping Code
- ASME B31.3, Process Piping Code

- ASME B31.8, Gas Transmission and Distribution Systems
- BCGA Code Of Practice CP4 Industrial Gas Cylinder Manifolds and Gas Distribution Pipework
- BCGA Code Of Practice CP33 The Bulk Storage of Gaseous Hydrogen at Users' Premises
- CGA G-5, Hydrogen
- CGA G-5.4, Standard for Hydrogen Piping Systems at Consumer Locations
- CGA G-5.5, Hydrogen Vent Systems
- CGA G-5.6, Hydrogen Pipeline Systems
- CGA G-5.8, High Pressure Hydrogen Piping Systems at Consumer Locations.
- FM Global Property Loss Prevention Data Sheets 7-50: Compressed Gases in Cylinders
- FM Global Property Loss Prevention Data Sheets 7-91: Hydrogen
- IGC Doc 121/04/E, Hydrogen Transportation Pipelines System Design Features
- NASA
- NSS 1740.16 Safety Standard For Hydrogen And Hydrogen Systems Guidelines for Hydrogen System Design, Materials Selection, Operations, Storage, and Transportation
- NFPA 52, Vehicular Fuel Systems Code
- NFPA 55, Standard for the Storage, Use, and Handling of Compressed Gases and Cryogenic Fluids in Portable and Stationary Containers, Cylinders, and Tanks, 2005 Edition
- NFPA 68, Standard on Explosion Protection by Deflagration Venting
- NFPA 70, National Electrical Code
- NFPA 497, Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas
- NFPA 13, Standard for the Installation of Sprinkler Systems
- NFPA 45, Standard on Fire Protection for Laboratories Using Chemicals
- NFPA 55, Standard for the Storage, Use, and Handling of Compressed Gases and Cryogenic Fluids in Portable and Stationary Containers, Cylinders, and Tanks
- NFPA 68, 2007 Standard on Explosion Protection by Deflagration Venting
- NFPA 69, Standard on Explosion Prevention Systems
- NFPA 91, Standard for Exhaust Systems for Air Conveying of Vapors

- NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials
- OSHA 29CFR1910.103 1910.103 Hydrogen

Hazardous Substances Precautions

WARNING Before using hazardous substances (toxic, harmful, and so on), read the hazard indications and information reported in the applicable Material Safety Data Sheet (MSDS.) Use Personal protection according to the safety requirements.

Venting Toxic Gases

When analyzing toxic compounds be aware that during the normal operation of the GC some of the sample might be vented outside the instrument through the inlet and detector exits; therefore, make sure to vent the exhaust gases to a fume hood. Consult local Environmental and Safety Regulations for instructions in exhausting fumes from your system.

Liquid Nitrogen Safety Precautions

Liquid nitrogen is a colorless, odorless, extremely cold liquid and gas under pressure. It can cause rapid suffocation when concentrations are sufficient to reduce oxygen levels below 19.5%. A Self Contained Breathing Apparatus (SCBA) might be required. Contact with liquid or cold vapors can cause severe frostbite. Cold vapors in the air will appear as a white fog due to condensation of moisture. Oxygen concentrations must be monitored in the release area. All cryogenic liquids produce large volumes of gas when they vaporize.

WARNING Before using Liquid Nitrogen, read the hazard indications and the instructions reported in the Safety sheet supplied by the manufacturer, with reference to the CAS number (Chemical Abstract Service) 7727-37-9.

Use personal protection:

- **Protective gloves**: Loose fitting thermal-insulated or leather gloves.
- **Eye protection**: Full face shield and safety glasses are recommended.
- **Other protective equipment**: Safety shoes when handling containers. Long sleeved shirts and trousers without cuffs. Work clothing that sufficiently prevents skin contact should be worn.

Carbon Dioxide Safety Precautions

Carbon dioxide is a colorless, cryogenic liquid. At low concentrations, is odorless. At higher concentrations carbon dioxide will have a sharp, acidic odor. At concentrations between 2 and 10%, Carbon dioxide can cause nausea, dizziness, headache, mental confusion, increased blood pressure, and increased respiratory rate. If the gas concentration reaches 10% or more, suffocation and death can occur within minutes. Contact with the cold gas can cause freezing of exposed tissue. Moisture in the air could lead to the formation of carbonic acid that can be irritating to the eyes. All forms of carbon dioxide are noncombustible. Carbon dioxide is heavier than air and should not be allowed to accumulate in low lying areas.

WARNING Before using carbon dioxide, read the indications of hazard and the instructions reported in the Safety sheet supplied by the manufacturer with reference to the CAS number (Chemical Abstract Service) 124-38-9.

Use personal protection:

- **Protective gloves**: Loose fitting thermal insulated or leather gloves.
- **Eye protection**: Full face shield and safety glasses are recommended.
- **Other protective equipment**: Safety shoes when handling containers. Long sleeved shirts and trousers without cuffs. Work clothing that sufficiently prevents skin contact should be worn.

1

Ordering Spare Parts

This chapter contains illustrations and part numbers for all of the replaceable components in the TRACE 1300/TRACE 1310. Refer to the *TRACE 1300 and TRACE 1310 Hardware Manual* for information about installing these components in your instrument.
Throughout the TRACE 1300/TRACE 1310 documentation, any component with a part number can be ordered from us. Components without a part number are not available.

Contents

- Abbreviations
- Identifying a Part
- Column Components
- Oven Components
- GC/GC-MS Components
- Gas Inlet Manifold Components
- Injector Modules Components
- Injection Port Liners
- Detector Modules Components
- Upgrade Modules
- Electronic Module Boards
- External Modules
- Cryo Components
- Kits & Miscellanea
- Tools

Abbreviations

Table 1 lists the abbreviations used in this guide.

Table 1. List of Abbreviations

Abbreviation	Description
AOI	Analog Output Interface
ECD	Electron Capture Detector
FID	Flame Ionization Detector
FPD	Flame Photometric Detector
GC	Gas Chromatograph
GC-MS	Gas Chromatograph and Mass Spectrometer
GDI	Generic Detector Interface
GSV	Gas Sampling Valve
HeS-S/SL	Instant Connect Helium Saver Injector
NPD	Nitrogen Phosphorus Detector
PDD	Pulsed Discharge Detector
SSL	Split/Splitless Injector
SSLBKF	Split/Splitless Injector for Backflush applications
Pkg	Package
PTV	Programmable Temperature Vaporizing Injector
PTVBKF	Programmable Temperature Vaporizing Injector for Backflush applications
TCD	Thermal Conductivity Detector

Identifying a Part

To identify a part, you need to know where the part is located in the TRACE 1300/TRACE 1310, or the part's relationship to a particular functionality of the TRACE 1300/TRACE 1310.

Use the categories in the table below to find the location or functionality that relates to the component you need. For example, if you know the part is related to the **SSL Injector** look in the **Injector Component** category. Refer to the illustrations in that category to identify a particular part.

IMPORTANT Only components with a part number are available for purchase. The part you are looking for may be shown in an illustration, but if it does not list a part number, it is not available.

Table 2. Parts That Can Be Reordered (Sheet 1 of 8)

Component	Uses	Thermo Scientific Parts Number	Category
Graphite Ferrule for 0.1 - 0.32 mm ID Columns (Pkg of 10)	SSL, SSLBKF, GSV, FID, NPD, TCD, ECD, FPD	290GA139	Column Components
Graphite Ferrule for 0.45 - 0.53 mm ID Columns (Pkg of 10)		290GA140	
Graphite Vespel® Ferrule for 0.1- 0.25 mm ID Columns (Pkg of 10)		290VA191	
Graphite Vespel® Ferrule for 0.32 mm ID Columns (Pkg of 10)		290VA192	
Graphite Vespel® Ferrule for 0.53 mm ID Columns (Pkg of 10)		290VA193	
Polyimide-Valcon® Reducing Ferrule for 0.36 ≤ 0.4 mm OD Tubing (Pkg of 5)	PDD	29003426	
Polyimide-Valcon® Reducing Ferrule for 0.4 ≤ 0.5 mm OD tubing (Pkg of 5)		29003427	
Blind Ferrule	SSL, SSLBKF, FID, ECD, NPD, TCD, FPD	29003421	
	PTV, PTVBKF	29003419	
Encapsulated Graphite Ferrule for 0.25 mm ID Columns (Pkg of 10)	PTV, PTVBKF, SSLBKF, GSV (Tee connector)	29053488	
Encapsulated Graphite Ferrule for 0.32 mm ID Columns (Pkg of 10)		29053487	
Encapsulated Graphite Ferrule for 0.53 mm ID Columns (Pkg of 10)		29053486	
SilFlow™ Fingertight Ferrule for 0.35 mm ID Columns (Pkg of 10)	No Vent, HeS-S/SL	29063465	
SilFlow™ Fingertight Ferrule for 0.4 mm ID Columns (Pkg of 10)	No Vent, HeS-S/SL	29063466	
Silflow™ Fingertight Ferrule for 0.5 mm ID Columns (Pkg of 10)	HeS-S/SL	29063467	
SilFlow™ Blanking Ferrule (Pkg of 5)	No Vent, HeS-S/SL	290ST414	
SilFlow™ Nut (Pkg of 10)	No Vent, HeS-S/SL	290SF302	
SilFlow Fingertight Tool	No Vent, HeS-S/SL	60201-401	
Reducing Graphite Vespel® Ferrule 1/8-1/16-in.	HeS-S/SL	29003422	
Retaining Nut, Hexagonal, 1/4-in. (Pkg of 5)	SSL, FID, NPD, TCD, ECD, FPD	35050458	
Split Retaining Nut, M4	SSLBKF, GSV, PTV, PTVBKF	35053221	
Nut 1/16-in. SS ZN1 (Pkg of 10)	HeS-S/SL	35023099	
Ferrule 1/16-in. SSZF1 (Pkg of 10)	HeS-S/SL	29024283	
Spring Loaded Nut (see kit P/N 19050251)	SSLBKF, PTVBKF	1R120434-0010	
Column Support (Rack)	GC, GC-MS	36814159	
Column-Flow Meter Connector	GC, GC-MS	24507000	
Tubing pre-cleaned, Pre-cut 316 SS; 1/16-in., 1 m long; 0.25 mm ID	HeS-S/SL	39104801	
Precolumn, 0.53 mm ID, 2 m long	SSLBKF, PTVBKF	26050-0253	

Table 2. Parts That Can Be Reordered (Sheet 2 of 8)

Component	Uses	Thermo Scientific Parts Number	Category
Oven Heater Baffle Assemble	GC, GC-MS	26600800	Oven Components
Oven Heater Temperature Sensor	GC, GC-MS	40303530	
Oven Motor	GC, GC-MS	31807047	
Oven Blower Fan	GC, GC-MS	41003510	
Flaps Stepper Motor	GC, GC-MS	23043678	
Oven Multiple	GC, GC-MS	39305418	
Duct for ISQ/TSQ 8000 Mass Spectrometer	GC-MS	25907025	
Duct for ITQ Mass Spectrometer	GC-MS	25907015	
Duct for TSQ Quantum Mass Spectrometer	GC-MS		
Duct for DSQ II Mass Spectrometer	GC-MS	25907020	
Duct Insulator, Small Size	GC-MS	30200115	
Hydrogen Sensor	GC, GC-MS	27605006	
Fan, Cooling	GC, GC-MS	23043702	GC/GC-MS Components
Filter, High Current Line, 16 A: 250 V	GC, GC-MS	23850005	
Touch Display Assy TRACE 1310	GC, GC-MS	33322000	
Status Panel TRACE 1300	GC, GC-MS	23719540	
Top Cover Assemble	GC, GC-MS	24104386	
Right Panel Assemble	GC, GC-MS	33311010	
Left Panel Assemble	GC, GC-MS	33311015	
Left Panel Assemble for ISQ/ITQ MS	GC, GC-MS	33312000	
Rear Cover Assemble	GC, GC-MS	33311025	
Cover Door Assemble for TRACE 1300	GC, GC-MS	30200128	
Cover Door Assemble for TRACE 1310	GC, GC-MS	33311000	
Door Assy Internal (with insulating)	GC, GC-MS	33315353	
Cables Holder-Handle	GC, GC-MS	28502213	
Gas Block Plug Kit	GC, GC-MS	19050773	
Syringe 10 µL, 50 mm needle length	GC, GC-MS	36500525	
Test Column, 7 m, 0.32 mm ID, 0.25 µm F.T.	GC, GC-MS	26080001	
Transformer, Toroidal 500 VA	GC, GC-MS	41325072	
O-ring, Injector/Detector Meting Block	GC, GC-MS	29031303	
Gas Inlet Manifold Components Kit	GC, GC-MS	19050751	Gas Inlet Manifold Components
Gas Inlet Fitting 1/8-in. for Toggle Valve	GC, GC-MS	35008438	

Table 2. Parts That Can Be Reordered (Sheet 3 of 8)

Component	Uses	Thermo Scientific Parts Number	Category
Filter, Split Line	SSL, SSLBKF, GVS, HeS-S/SL, PTV, PTVBKF	28113197	Injector Modules Components
Filter, Carrier Line	SSL, SSLBKF, GSV, HeS-S/SL, PTV, PTVBKF	28113196	
Fitting Cap, Backflush Line	SSLBKF, PTVBKF, GSV	35003036	
Injector Body, SSL	SSL, SSLBKF	24705240	
Injector Body, HeS-S/SL	HeS-S/SL	24705255	
He Saver Potted Box Assembly	HeS-S/SL	27609926	
Injector Head Assembly	PTV, PTVBKF	40203011	
Liner Cap/Septum Holder	SSL, SSLBKF, HeS-S/SL	40203005	
Liner Cap	PTV, PTVBKF	29004014	
Liner Seal	SSL, SSLBKF, HeS-S/SL	29001320	
Liner Seal	PTV, PTVBKF	29001325	
O-Ring External, Body Head	SSL, SSLBKF, HeS-S/SL	29001316	
O-Ring, Internal, Body Head	SSL, SSLBKF, HeS-S/SL	29001313	
O-Ring (Parafluor 2--6) Manifold	SSL, SSLBKF, PTV, PTVBKF, HeS-S/SL	29011310	
Retaining Nut (for Column Adapter)	SSL, SSLBKF	35001126	
Ring Nut	SSL, SSLBKF, HeS-S/SL	35001821	
Septum, BTO 11 mm OD with center guide	SSL, SSLBKF, HeS-S/SL, PTV, PTVBKF	31303233	
Septum Cap	SSL, SSLBKF, HeS-S/SL, PTV, PTVBKF	35001820	
Septum Cap for AI 1310 Autosampler and for HS (TriPlus Only)	SSL, SSLBKF, HeS-S/SL, PTV, PTVBKF	35001819	
Silver Seal	PTV, PTVBKF	29013820	
Base Seal and washer	SSL, SSLBKF	290GA081	
Precolumn, 2 m length, 0,5 mm	SSLBKF, PTVBKF	26050-0253	
Terminal Bottom Fitting 1 mm ID	PTV, PTVBKF	35008429	
Terminal Bottom Fitting 0.55 mm ID	PTV, PTVBKF	35008428	
Six-ports Diaphragm Valve	GSV	40516165	
Kit Sample Loop 20 µL	GSV	19071405	
Kit Sample Loop 50 µL	GSV	19071404	
Kit Sample Loop 100 µL	GSV	19071403	
Kit Sample Loop 250 µL	GSV	19071402	
Kit Sample Loop 500 µL	GSV	19071401	
Kit Sample Loop 1000 µL	GSV	19071400	
Bottom Insulator	HeS-S/SL	29004408	

Table 2. Parts That Can Be Reordered (Sheet 4 of 8)

Component	Uses	Thermo Scientific Parts Number	Category
Adapter TRACE 1300 to 1/16-in.	HeS-S/SL	35002123	Injector Modules Components *(Continued)*
O-ring, Gas Delivery Block	HeS-S/SL	29031303	
SSL Split Straight Liner, Deactivated, 4 mm ID x 6.3 mm OD x 78.5mm Length, Quartz Wool	SSL, SSLBKF, HeS-S/SL	453A2265	Injection Port Liners
SSL Splitless Liner, single Taper, Deactivated, 4 mm ID x 6.3 mm OD x 78.5 mm Length, Quartz Wool	SSL, SSLBKF, HeS-S/SL	453A1925	
SSL Split Straight Liner, Deactivated, 4 mm ID x 6.3 mm OD x 78.5 mm Length	SSL, SSLBKF, HeS-S/SL	453A1295	
SSL Splitless Liner, Single Taper, Deactivated, 4 mm ID x 6.3 mm OD x 78.5 mm Length	SSL, SSLBKF, HeS-S/SL	453A1345	
SSL Direct Straight Liner for HS/SPME, Deactivated, 1.2 mm ID x 6.3 mm OD x 78.5 mm Length	SSL, SSLBKF, HeS-S/SL	453A1335	
SSL Mini-LAM Liner, Deactivated, 4 mm ID x 6.3 mm OD x 78.5 mm Length	SSL, SSLBKF, HeS-S/SL	453A2009	
PTV Liner, Deactivated, 2 mm ID x 2.75 mm OD x 120 mm Length, Quartz Wool	PTV	45352070	
PTV Siltek Metal Liner, 2 mm ID x 2.75 mm OD x 120 mm Length	PTV, PTVBKF	45322044	
PTV Liner, Non-Deactivated, 2 mm ID x 2.75 mm OD x 120 mm Length	PTV, PTVBKF	45322045	
PTV Siltek Metal Liner, 1 mm ID x 2.75 mm OD x 120 mm Length	PTV, PTVBKF	45322046	
PTV Straight Liner, Deactivated, 1 mm ID x 2.75 mm OD x 120 mm Length	PTV, PTVBKF	45352054	
PTV Straight Liner, Deactivated, 2 mm ID x 2.75 mm OD x 120 mm Length	PTV, PTVBKF	45352057	
PTV Siltek Metal Liner, 2 mm ID x 2.75 mm OD x 120 mm Length	PTV, PTVBKF	45322056	
PTV Liner with Sintered, Deactivated 2 mm ID x 2.75 mm OD x 120 mm Length	PTV, PTVBKF	45352060	
PTV Liner with Three Baffles, Deactivated, 1 mm ID x 2.75 mm OD x 120 mm Length	PTV, PTVBKF	45352062	
PTV Baffle Liner (Siltek), Deactivated, 2 mm ID x 2.75 mm OD x 120 mm Length	PTV, PTVBKF	453T2120	
PTV Silcosteel Liner Simile On-Column, 1 mm ID x 2.75 mm OD x120 mm Length, with 0.6 mm ID Restriction	PTV	45322052	
Short Liner, 2 mm ID x 2.75 mm OD Short (for Hot Injection Adapter Kit P/N 19050733)	---	45322059	

Table 2. Parts That Can Be Reordered (Sheet 5 of 8)

Component	Uses	Thermo Scientific Parts Number	Category
Retaining Nut (for Column Adapter)	FID, NPD, ECD, TCD, FPD	35001126	Detector Modules Components
Cell Top Cover Assemble (Top Body)	FID	24705245	
Collecting Electrode	FID	27700900	
Collecting Electrode (Anode)	ECD	21600210	
Collecting Electrode for Thermionic Source	NPD	27701600	
Collecting Electrode Pin	FID	20601604	
	NPD, ECD	20604305	
Collecting Electrode (Anode) Seal	ECD	29032608	
Collecting Electrode (Anode) Screw	ECD	35006118	
Collector Insulator	FID	30202400	
Detector Cap (Ring Nut)	FID	35001124	
Measuring Tool Flowmeter Adapter	FID	34709348	
	NPD	34709610	
	FPD	34709630	
Glow-Plug (Igniter)	FID, FPD	40303535	
Glow-Plug Cable	FID	23043717	
Insulator Ring	FID	29004612	
Collector Insulator	NPD	30202405	
Jet; Ceramic Flame	FID	40402200	
Jet; Stainless Steel	NPD	40404516	
Jet, Deactivated Silcosteel	FPD	40404518	
Polarizing Electrode	FID	27702330	
Thermionic Source TID 2 (standard) for both N and P detections	NPD	46500256	
Thermionic Source TID 4 (optional) for enhanced N response	NPD	46500257	
FPD Detector Assembly	FPD	29903110	
Aluminium O-ring	FPD	29032630	
Kit Interferential Filter for Sulfur (28107101 + Spacer)	FPD	19050785	
Kit Interferential Filter for Phosphorus (28107102 + Spacer)	FPD	19050786	
Interferential Filter for Sulfur	FPD	28107000	
Interferential Filter for Phosphorus	FPD	28107100	
Interferential Filter for Tin	FPD	28107001	
Photomultiplier Tube	FPD	28600460	
Fixing Tool, FPD Detector Assembly	FPD	20501608	
PDD Pulse Generator (Pulser)	PDD	43210075	

Table 2. Parts That Can Be Reordered (Sheet 6 of 8)

Component	Uses	Thermo Scientific Parts Number	Category
PDD Purifier Assy	PDD	43210076	Detector Modules Components *(Continued)*
PDD Mini Helium Purifier Kit	PDD	19071500	
PDD Cell	PDD	41910716	
PDD Flow restriction	PDD	24505908	
PDD Packed Column Adapter	PDD	26060521	
GDI Low Flow Restrictor	GDI	24503330	
GDI Medium Flow Restrictor	GDI	24503333	
GDI High Flow Restrictor	GDI	24503334	
Test Mixture	FID	33819020	
	NPD, FPD	33819006	
	TCD	33819016	
	ECD	33819011	
	PDD	33819032	
Detector Module, ECD for China market	ECD	19070029	Upgrade Modules
Detector Module, ECD for International market	ECD	19070030	
Detector Module, ECD for USA market (General License)	ECD	19070031	
Detector Module, ECD for USA market (Special License)	ECD	19070032	
Detector Module, ECD for Canada market	ECD	19070033	
Detector Module, FID	FID	19070001	
Detector Module, NPD	NPD	19070060	
Detector Module, TCD Nickel-Iron (Ni-Fe) filament cell	TCD	19070040	
Detector Module, TCD Tungsten-Rhenium (W-Re) filament cell	TCD	19070041	
Detector Module TCD In-Series Connection Nickel-Iron (Ni-Fe) filament cell	TCD	19070045	
Detector Module TCD In-Series Connection Tungsten-Rhenium (W-Re) filament cell	TCD	19070046	
Detector Module, FPD	FPD	19070096	
Dummy Module	All Modules	19070097	
Electronic Module 120 Vac	GC, GC-MS	43210168	
Electronic Module 230 Vac	GC, GC-MS	43210167	
Injector Module, SSL	SSL	19070010	
Injector Module, SSLBKF	SSLBKF	19070011	
Injector Module, Gas Sampling Valve	GSV	19070095	
Injector Module, Helium Saver S/SL	HeS-S/SL	19070013	
Injector Module, PTV	PTV	19070020	

Table 2. Parts That Can Be Reordered (Sheet 7 of 8)

Component	Uses	Thermo Scientific Parts Number	Category
Injector Module, PTVBKF	PTVBKF	19070021	Upgrade Modules *(Continued)*
FTIR Make-up Module	GC-FTIR	19070050	
No Vent Microfluidics Module	GC-MS	19070090	
Detector Module, PDD	PDD	19070014	
Analog Output Interface	GC, GCMS	19070022	
Rear Backplane Board (BKP-HRM; PC1256)	GC, GC-MS	23661000	Electronic Module Boards
Oven CPU-Power Control Board (OVN-HRM; 230 V; PC1257)	GC, GC-MS	23661010	
Oven CPU-Power Control Board (OVN-HRM; 120 V; PC1257-01)	GC, GC-MS	23661011	
Main CPU Board (CPU-HRM; PC1258)	GC, GC-MS	23661015	
Memory Board (MEM-HRM; PC1259)	GC, GC-MS	23661020	
External Interface Board (EXT-HRM; PC1263)	GC, GC-MS	23661025	
Power Supply Board	GC, GC-MS	20806090	
Aux Temperature/Cryo Module	GC, GC-MS	19070070	External Modules
Auxiliary Gases Module	GC, GC-MS	19070080	
NPD Thermionic Source Power Module	GC, GC-MS	43215010	
Oven Cryo CO_2 Assemble	GC, GC-MS	19050753	Cryo Components
Oven Cryo N_2 Assemble	GC, GC-MS	19050752	
PTV Cryo CO_2 Assemble	GC, GC-MS	19050755	
PTV Cryo N_2 Assemble	GC, GC-MS	19050754	
Merlin Valve Kit	SSL, SSLBKF, PTV, PTVBKF, HeS-S/SL	19050735	Kits & Miscellanea+
Clamp Bracket for Backflush	SSLBKF, PTVBKF, GSV	19050757	
Packed Column Adapters Kit	SSL, FID, NPD, TCD, ECD	19050758	
Graph-pack (Encapsulated Graphite) Ferrules Adapters	SSL, FID, NPD, TCD, ECD	19050759	
Oven Exhaust Kit	GC, GC-MS	19050760	
SSL Maintenance Kit	SSL, SSLBKF, HeS-S/SL	19050770	
SSL O-Ring Kit	SSL, SSLBKF, HeS-S/SL	19050771	
FID Igniter Kit	FID	19050775	
FID Maintenance Kit	FID	19050776	
NPD Maintenance Kit	NPD	19050777	
ECD Anode Replacement Kit	ECD	19050779	
ECD Exhaust Vent Kit	ECD	19070024	
FPD Maintenance Kit	FPD	19004589	
FPD Dual PMT FPD Kit	FPD	19050783	
PTV Maintenance Kit	PTV, PTVBKF	19050780	

Table 2. Parts That Can Be Reordered (Sheet 8 of 8)

Component	Uses	Thermo Scientific Parts Number	Category
TriPlus Leg Support for TRACE 1300/1310	GC, GC-MS	19050489	Kits & Miscellanea *(Continued)*
TriPlus RSH Mounting Leg	GC, GC-MS	1R77010-1066	
TriPlus RSH Mounting Kit	GC, GC-MS	1R77010-1005	
Power Cable, 16 A, 230 V	GC, GC-MS	23033025	
Power Cable, 20 A, 120 V	GC, GC-MS	23033030	
LAN Communication Pin-to-Pin Cable	GC, GC-MS	23043592	
EV Helium Saver Connection Cable	HeS-S/SL	23043731	
LAN Communication Cross Cable	GC, GC-MS, SSL, SSLBKF, PTV, PTVBKF, FID, NPD, TCD, ECD, FPD	23043593	
MS Start Cable	GC/MS	23043546	
Tee Connector for Holder Kit	SSLBKF, PTVBKF	19050251	
Tee Connector Kit for High Temperature	SSLBKF, PTVBKF	19050254	
No Vent Microfluidics Installation Kit	GCMS	19098025	
Dual Detector Microfluidics Kit	GCMS	19071030	
UHP Helium & N2 GPK Gas Purification Kit	HeS-S/SL	1R120577-0001	
Oxygen Trap High Capacity	HeS-S/SL	1R77607-0001	
Helium Regulator Kit	HeS-S/SL	1R77607-0001	
Hot Injection Adapter	SSL, SSLBKF	19050733	
Packed Column Adapter Kit for Gas Sampling Valve	GSV	19050762	
Pressure Regulator Kit for Gas Sampling Valve	GSV	19050763	
Backflush Kit for Gas Sampling Valve	GSV	19050764	
Generic Detector Interface (GDI)	GC, GC-MS	19070015	
Deans Switch Microfluidics Kit	GC, GC-MS	19005580	
Purge & Trap Adapter Kit	SSL, SSLBKF	19050730	
O-Ring, SSL Liner (for Purge & Trap Adapter)	SSL, SSLBKF	MI-290AA1-0001	
Thermospray SSL Injector Module Kit	GC/GC-MS	19070016	
SSL Adapter Head for PerkinElmer TurboMatrix™ HS	SSL	34709361	
Packed columns Support Kit	GC-GC-MS	19070124	
Ceramic Column Cutter	GC-GC-MS	60201-318	Tools
USB Oven Light (for TRACE 1310 Only)	GC, GC-MS	30502700	
Wrench, Socket, 1/2-in.	GC-GC-MS	20503022	

Column Components

You can purchase the following column components for the TRACE 1300/TRACE 1310 gas chromatograph. See Table 3.

Be sure to reference the component's part number when placing an order with your local Sales/Service Representative. See the *TRACE 1300 and TRACE 1310 Hardware Manual* for information about installing these components or Table 2 for a comprehensive list of available components.

Note Visit www.thermo.com/columns for information about ordering a column.

The images are not in scale.

Table 3. Column Components (Sheet 1 of 3)

Description		Quantity	Part Number
Graphite Ferrule for 0.1 mm - 0.32 mm Column for SSL, SSLBKF, GSV, FID, NPD, TCD, ECD, FPD		Pkg of 10	290GA139
Graphite Ferrule for 0.45 mm - 0.53 mm Column for SSL, SSLBKF, GSV, FID, NPD, TCD, ECD, FPD		Pkg of 10	290GA140
Graphite Vespel® Ferrule for 0.1 mm - 0.25 mm Column for SSL, SSLBKF, GSV, FID, NPD, TCD, ECD, FPD		Pkg of 10	290VA191
Graphite Vespel® Ferrule for 0.32 mm Column for SSL, SSLBKF, GSV, FID, NPD, TCD, ECD, FPD		Pkg of 10	290VA192
Graphite Vespel® Ferrule for 0.53 mm Column for SSL, SSLBKF, GSV, FID, NPD, TCD, ECD, FPD		Pkg of 10	290VA193
Polyimide Valcon Reducing Ferrule for 0.36 ≤ 0.4 mm OD Tubing for PDD		(Pkg of 5)	29003426
Polyimide Valcon Reducing Ferrule for 0.4 ≤ 0.5 mm OD tubing for PDD		(Pkg of 5)	29003427
Encapsulated Graphite Ferrule for 0.1 - 0.25 mm Column for PTV, PTVBKF, SSLBKF, and GSV (Tee connector)		Pkg of 10	29053488
Encapsulated Graphite Ferrule for 0.32 mm Column for PTV, PTVBKF, SSLBKF, and GSV (Tee connector)		Pkg of 10	29053487
Encapsulated Graphite Ferrule for 0.53 mm Column for PTV, PTVBKF, SSLBKF, and GSV (Tee connector)		Pkg of 10	29053486

Table 3. Column Components (Sheet 2 of 3)

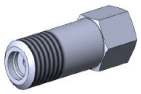
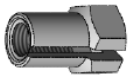
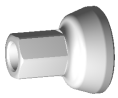
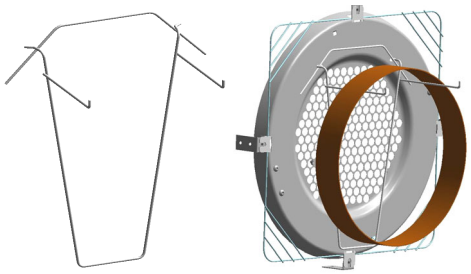
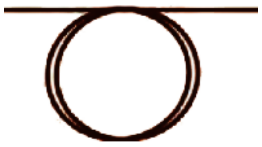
Description		Quantity	Part Number
SilFlow™ Fingertight Ferrule for 0.35 mm ID Column for HeS-S/SL		Pkg of 10	29063465
SilFlow™ Fingertight Ferrule for 0.4 mm ID Column for HeS-S/SL and NoVent Microfluidics		Pkg of 10	29063466
SilFlow™ Fingertight Ferrule for 0.5 mm ID Column for HeS-S/SL and NoVent Microfluidics		Pkg of 10	29063467
SilFlow™ Blanking Ferrule for HeS-S/SL and NoVent Microfluidic		Pkg of 5	290ST414
SilFlow™ Nut for HeS-S/SL and NoVent Microfluidics		Pkg of 10	290SF302
SilFlow™ Fingertight Tool for HeS-S/SL and NoVent Microfluidics		Each	60201-401
Reducing Graphite Vespel® Ferrule 1/8-1/16-in. for HeS-S/SL		Each	29003422
Nut 1/16-in. SS ZN1 for HeS-S/SL		Pkg of 10	35023099
Ferrule 1/16-in. SSZF1 for HeS-S/SL		Pkg of 10	29024283
Blind Ferrule for SSL, SSLBKF, FID, ECD, NPD, TCD, and FPD		Each	29003421
Blind Ferrule for PTV, and PTVBKF		Each	29003419
Retaining Nut, Hexagonal, 1/4-in. (M6)		Pkg of 5	35050458
Split Retaining Nut (M4)		Pkg of 5	35053221
Spring Loaded Nut (see kit P/N 19050251)		Each	1R120434-0010

Table 3. Column Components (Sheet 3 of 3)

Description		Quantity	Part Number
Column Support (Rack)		Each	36814159
Column-Flow Meter Connector		Each	24507000
Tubing pre-cleaned, Pre-cut 316 SS; 1/16-in., 1 m long; 0.25 mm ID for Helium Saver and SSL		Each	39104801
Precolumn 0.53 mm ID, 2 m Long		Each	26050-0253

Oven Components

You can purchase the following Oven components for the TRACE 1300/TRACE 1310 gas chromatograph. See Table 4.

Be sure to reference the component's part number when placing an order with your local Sales/Service Representative. See the *TRACE 1300 and TRACE 1310 Hardware Manual* for information about installing these components or Table 2 for a comprehensive list of available components.

Note The images are not in scale.

Table 4. Oven Components (Sheet 1 of 3)

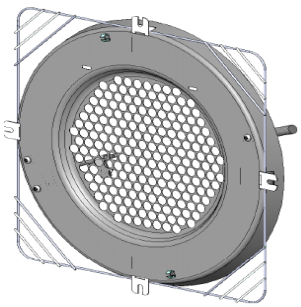
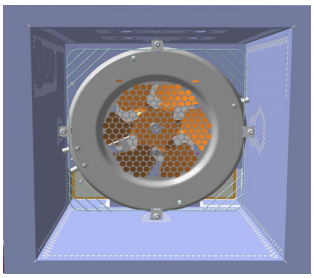
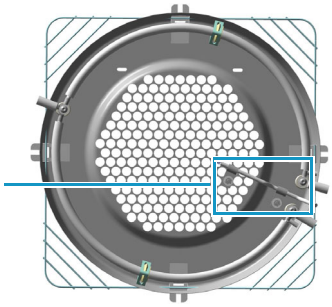
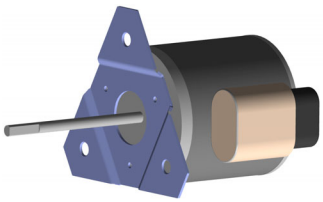
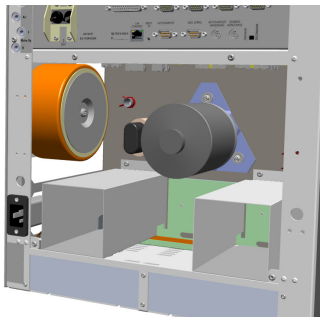
Description		Quantity	Part Number
Oven Heater Baffle Assemble (120/230 V)	 	Each	26600800
Oven Heater Temperature Sensor		Each	40303530
Oven Motor	 	Each	31807047

Table 4. Oven Components (Sheet 2 of 3)

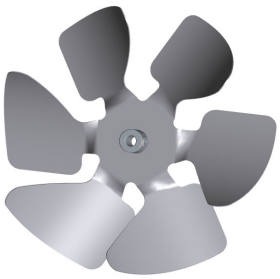
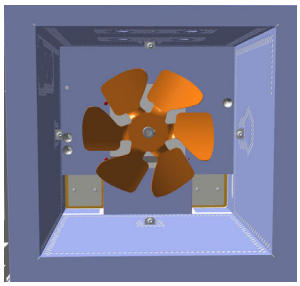
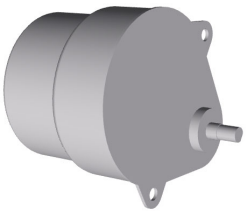
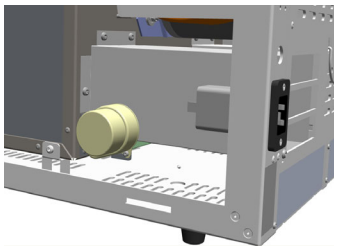
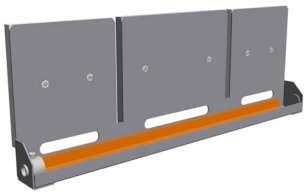
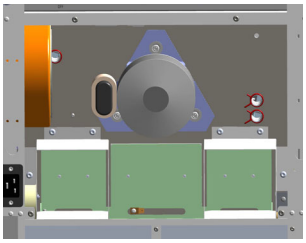
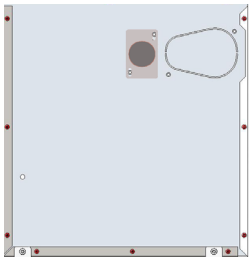
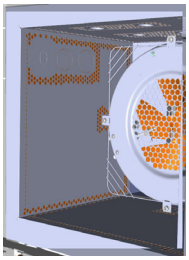
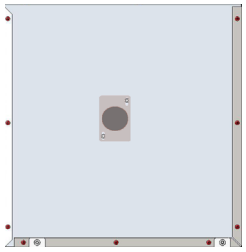
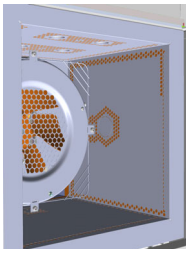
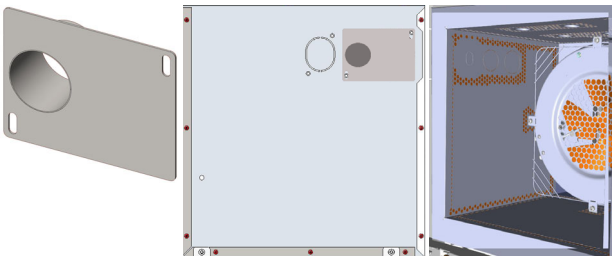
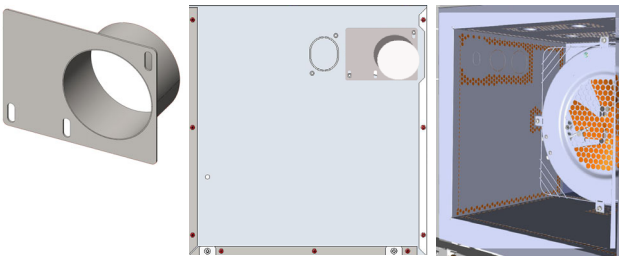
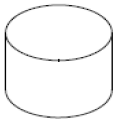
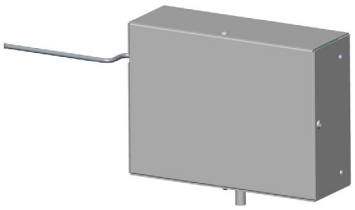
Description		Quantity	Part Number
Oven Blower Fan	 	Each	41003510
Flaps Stepper Motor	 	Each	23043678
Oven Multiple	 	Each	39305418
Duct for ITQ Mass Spectrometer	 	Each	25907015
Duct for TSQ Quantum Mass Spectrometer	 	Each	25907015

Table 4. Oven Components (Sheet 3 of 3)

Description		Quantity	Part Number
Duct for DSQ Mass Spectrometer		Each	25907020
Duct for ISQ/TSQ 8000 Mass Spectrometer		Each	25907025
Duct Insulator		Each	30200115
Hydrogen Sensor		Each	27605006

GC/GC-MS Components

You can purchase the following components for the TRACE 1300/TRACE 1310 gas chromatograph stand-alone and MS versions (GC/GC-MS). See Table 5.

Be sure to reference the component's part number when placing an order with your local Sales/Service Representative. See the *TRACE 1300 and TRACE 1310 Hardware Manual* for information about installing these components or Table 2 for a comprehensive list of available components.

Note The images are not in scale.

Table 5. GC/GC-MS Components (Sheet 1 of 4)

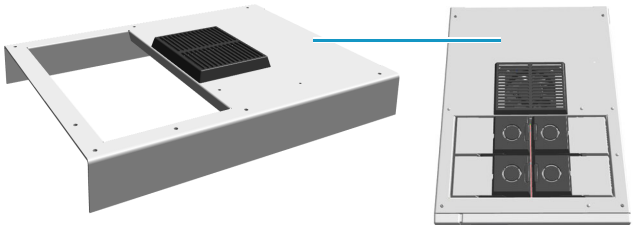
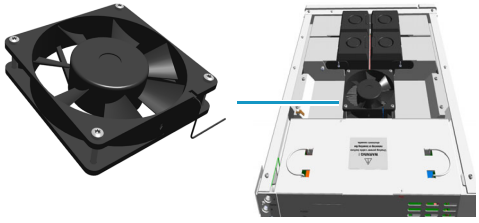
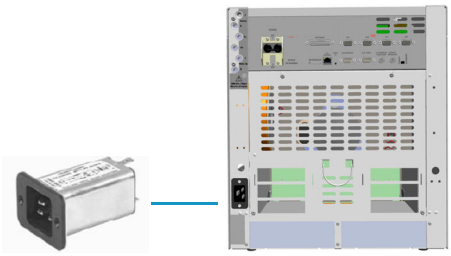
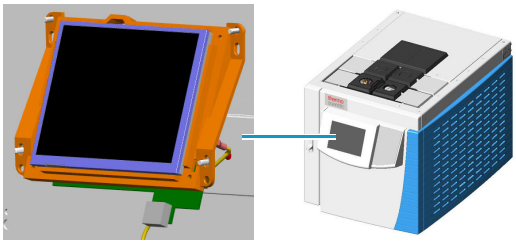
Description		Quantity	Part Number
Top Cover Assemble		Each	24104386
Cooling Fan		Each	23043702
High Current Line Filter 16 A; 250 V		Each	23850005
Touch Display Assy TRACE 1300		Each	33322000

Table 5. GC/GC-MS Components (Sheet 2 of 4)

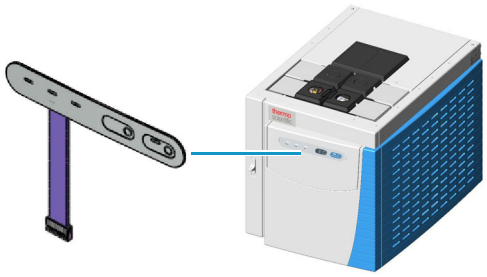
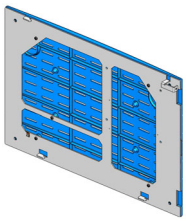
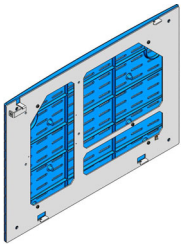
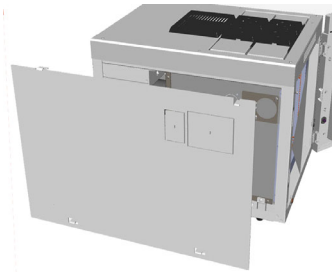
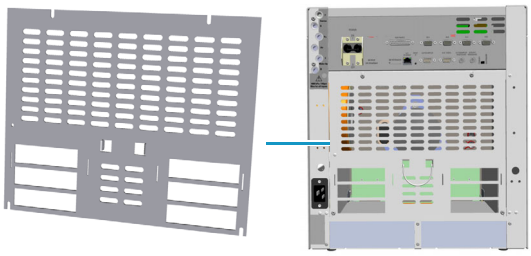
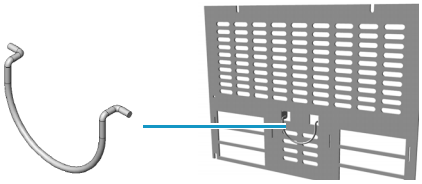
Description	Quantity	Part Number
Status Panel TRACE 1300 	Each	23719540
Right Panel Assemble 	Each	33311010
Left Panel Assemble 	Each	33311015
Left Panel for ISQ/ITQ MS Assemble 	Each	33312000
Rear Cover Assemble 	Each	33311025
Cables Holder-Handle 	Each	28502213

Table 5. GC/GC-MS Components (Sheet 3 of 4)

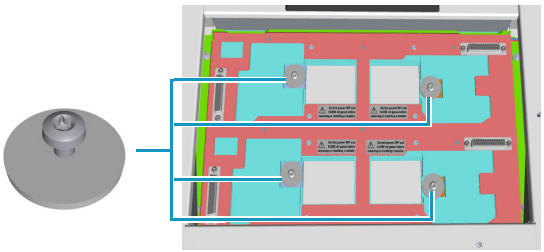
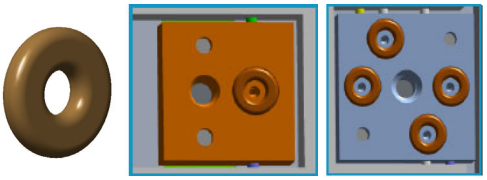
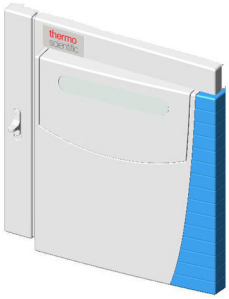
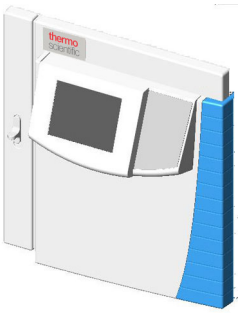
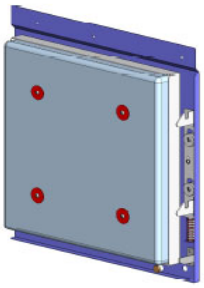
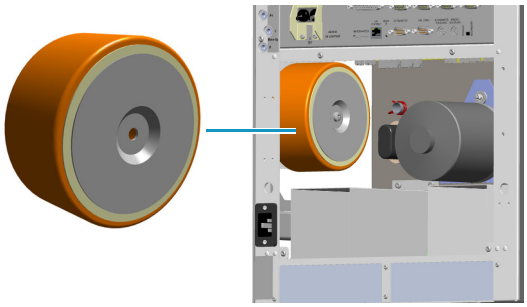
Description	Quantity	Part Number
Gas Block Plug Kit 	Each	19050773
Injector/Detector Meting Block O-ring 	Pkg of 10	29031303
Door Cover Assemble for TRACE 1300 	Each	30200128
Door Cover Assemble for TRACE 1310 	Each	33311000
Door Assy Internal (with insulating) 	Each	33315353

Table 5. GC/GC-MS Components (Sheet 4 of 4)

Description	Quantity	Part Number
Toroidal Transformer 500 VA 	Each	41325072
Syringe 10 µL, 50 mm Needle Valve	Each	36500525
Test Column, 7 m, 0.32 mm ID, 0.25 µm F.T.	Each	26080001

Gas Inlet Manifold Components

You can purchase the following manifold components for the TRACE 1300/TRACE 1310 gas chromatograph. See Figure 1 and Table 6.

Be sure to reference the component's part number when placing an order with your local Sales/Service Representative. See the *TRACE 1300 and TRACE 1310 Hardware Manual* for information about installing these components or Table 2 for a comprehensive list of available components.

Note The images are not in scale.

Figure 1. Fittings for Gas Inlet Connection

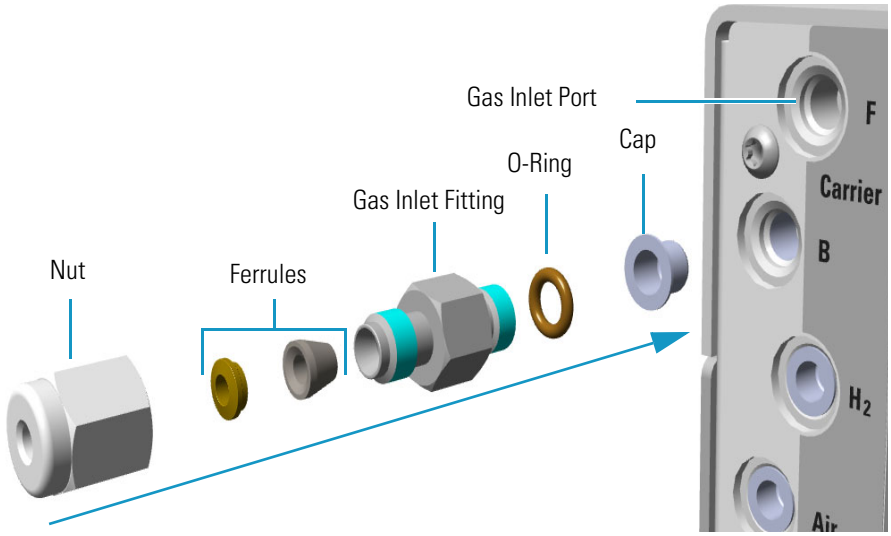
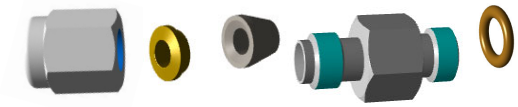
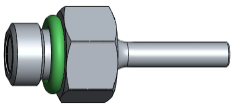


Table 6. Gas Inlet Manifold Components

Description		Quantity	Part Number
Gas Inlet Fittings Kit		Each	19050751
Gas Inlet Fitting 1/8-in. (for Toggle Valve)		Each	35008438

Injector Modules Components

You can purchase the following components for the injector modules. Be sure to reference the component's part number when placing an order with your local Sales/Service Representative. See the *TRACE 1300 and TRACE 1310 Hardware Manual* for information about installing these components or Table 2 for a comprehensive list of available components.

The following injector modules components can be replaced on the TRACE 1300/TRACE 1310.

- SSL Injector Module Components
- SSLBKF Injector Module Components
- PTV Injector Module Components
- PTVBKF Injector Module Components
- GSV Module Components
- Instant Connect Helium Saver Injector Module (HeS-S/SL) Components
- SSL Injector Ports Liner
- PTV Injector Ports Liner

Note The images are not in scale.

SSL Injector Module Components

The following SSL injector components can be replaced. See Figure 2 and Table 7.

Figure 2. Split Splitless Injector Components

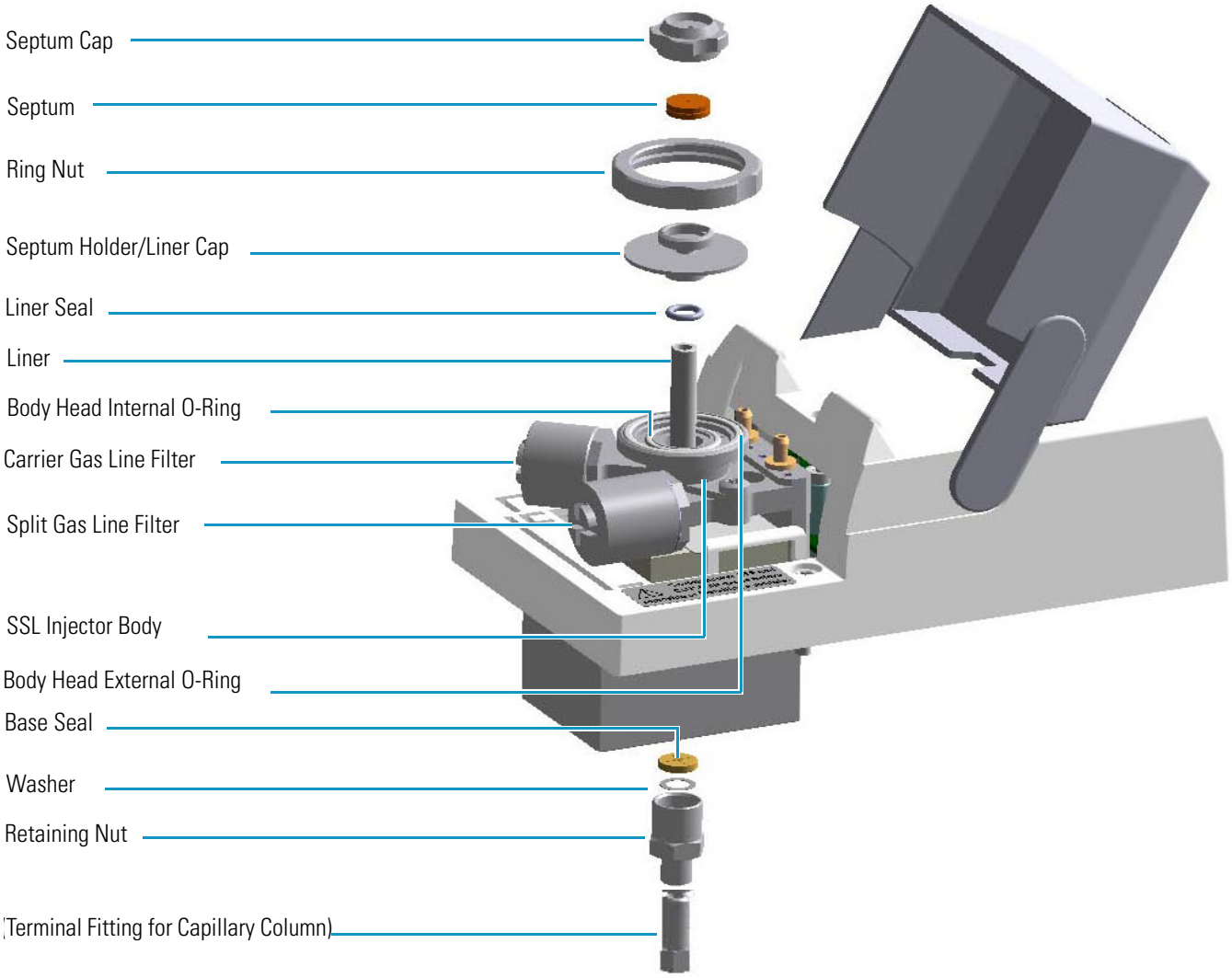


Table 7. SSL Injector Components (Sheet 1 of 2)

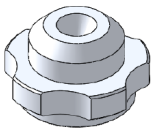
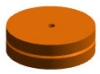
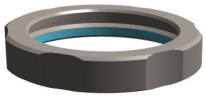
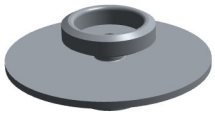
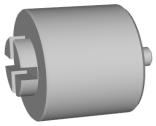
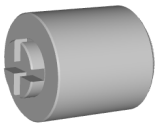
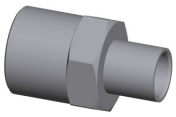
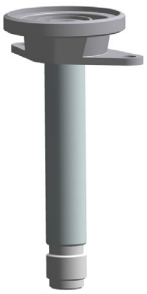
Description		Quantity	Part Number
Septum Cap		Each	35001820
Septum Cap for AI/AS1310 Autosampler and for HS applications with the TriPlus Autosampler.		Each	35001819

Table 7. SSL Injector Components (Sheet 2 of 2)

Description	Quantity	Part Number
Septum with Center Guide 	Pkg of 50	31303233
Ring Nut 	Each	35001821
Liner Cap/Septum Holder 	Each	40203005
Liner Seal for SSL	Pkg of 5	29001320
Liner See SSL Injector Ports Liner on page 36	Each	
Body Head Internal O-Ring	Each	29001313
Body Head External O-Ring	Each	29001316
Carrier Line Filter 	Each	28113196
Split Line Filter 	Each	28113197
Base Seal and Washer	Pkg of 10	290GA081
Retaining Nut (for Column Adapter) 	Each	35001126
SSL Injector Body 	Each	24705240
O-ring Parafluor 2-006 for SSL manifold	Pkg of 3	29011310

SSLBKF Injector Module Components

The following SSLBKF injector components can be replaced. See Figure 3 and Table 8.

Figure 3. Split Splitless Injector for Backflush Components

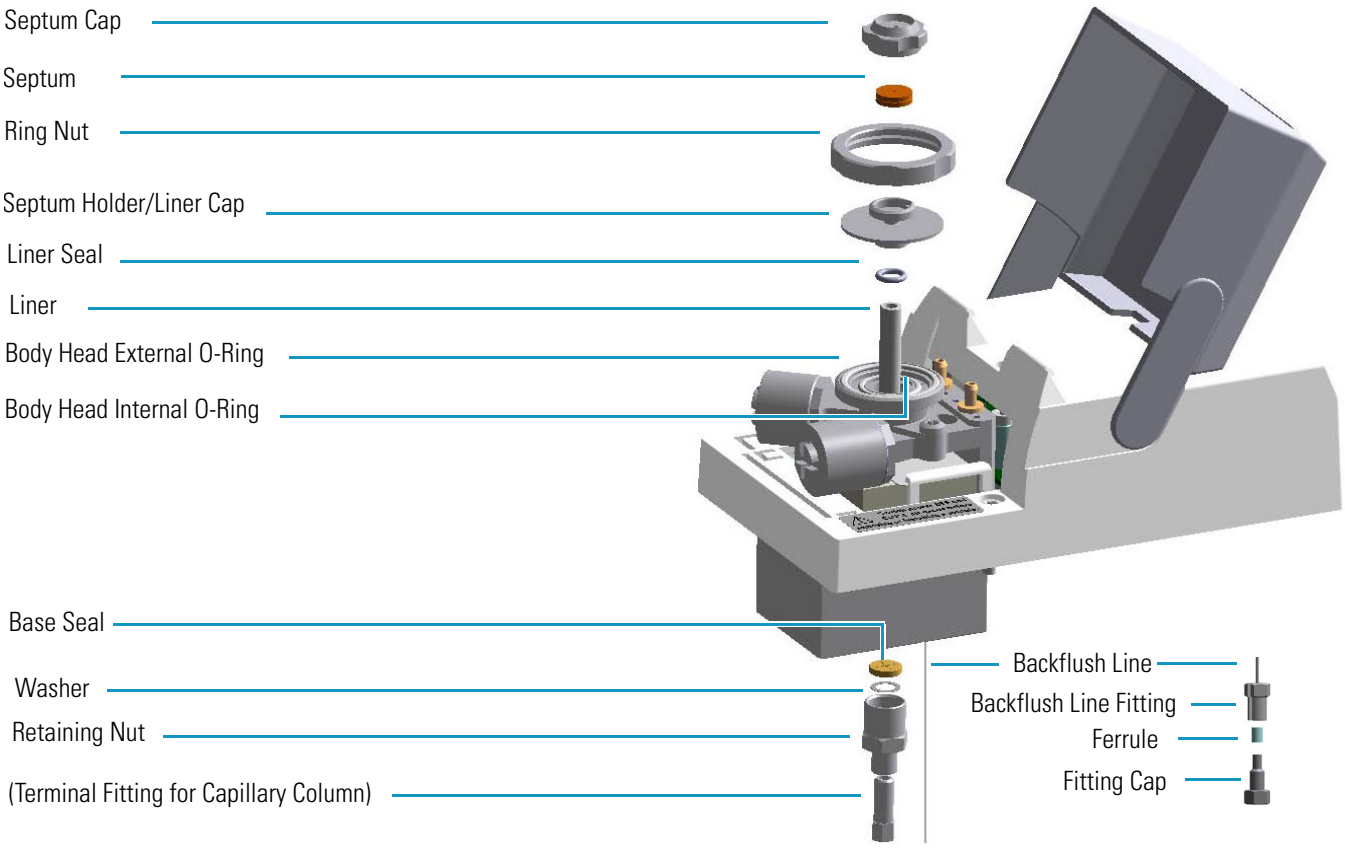


Table 8. SSLBKF Injector Components (Sheet 1 of 2)

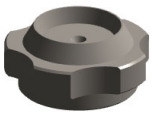
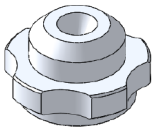
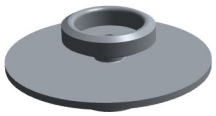
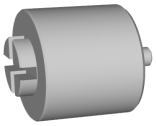
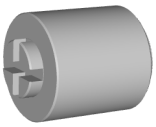
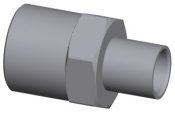
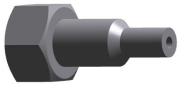
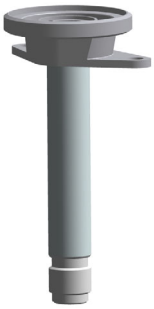
Description		Quantity	Part Number
Septum Cap		Each	35001820
Septum Cap for AI/AS1310 Autosampler and for HS applications with the TriPlus Autosampler.		Each	35001819
Septum with Center Guide		Pkg of 50	31303233
Ring Nut		Each	35001821

Table 8. SSLBKF Injector Components (Sheet 2 of 2)

Description	Quantity	Part Number
Liner Cap/Septum Holder 	Each	40203005
Liner Seal for SSL	Pkg of 5	29001320
Liner See SSL Injector Ports Liner on page 36	Each	
Body Head Internal O-Ring	Each	29001313
Body Head External O-Ring	Each	29001316
Carrier Line Filter 	Each	28113196
Split Line Filter 	Each	28113197
Base Seal and Washer	Pkg of 10	290GA081
Retaining Nut (for Column Adapter) 	Each	35001126
Fitting Cap 	Each	35003036
O-ring Parafluor 2-006 for SSL Manifold	Pkg of 3	29011310
SSL Injector Body 	Each	24705240

PTV Injector Module Components

The following PTV injector components can be replaced. See Figure 4 and Table 9.

Figure 4. Programmable Temperature Vaporizing Injector Components

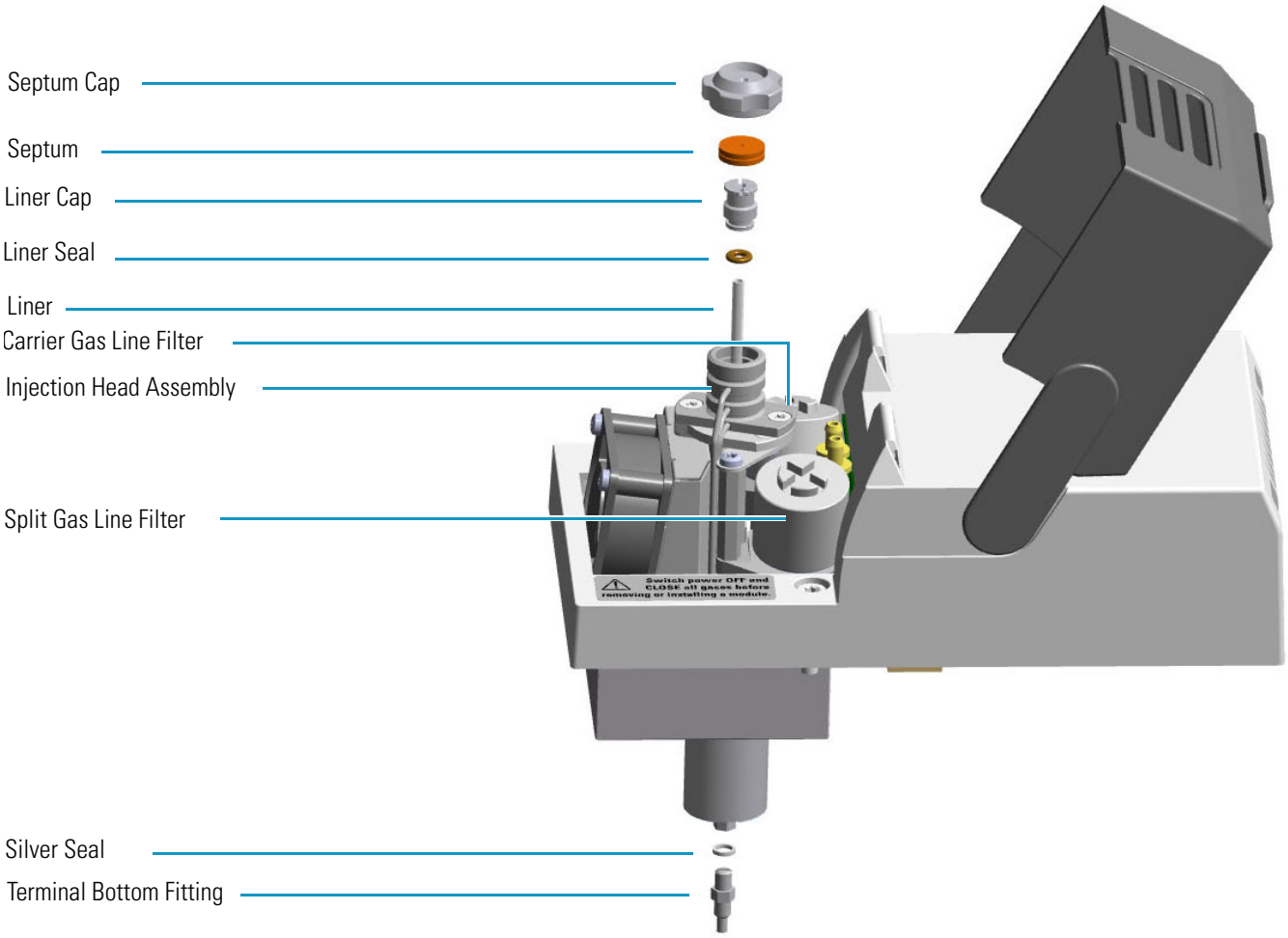


Table 9. PTV Injector Components (Sheet 1 of 2)

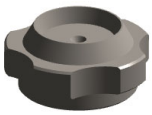
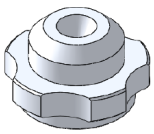
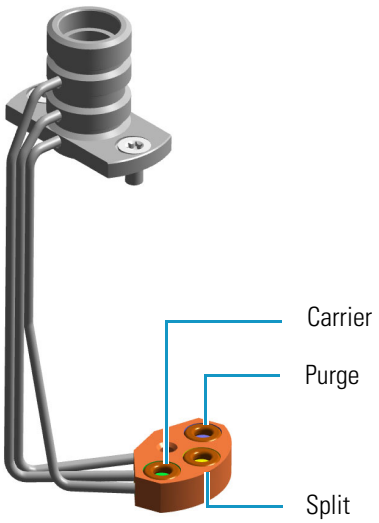
Description		Quantity	Part Number
Septum Cap		Each	35001820
Septum Cap for AI/AS 1310 Autosampler and for HS applications with the TriPlus Autosampler.		Each	35001819
Septum with Center Guide		Pkg of 50	31303233

Table 9. PTV Injector Components (Sheet 2 of 2)

Description	Quantity	Part Number
Liner Cap	Each	29004014
Liner Seal for PTV	Pkg of 5	29001325
Liner See PTV Injector Ports Liner on page 37	Each	
Carrier Line Filter	Each	28113196
Split Line Filter	Each	28113197
Silver Seal	Pkg of 2	29013820
Terminal Bottom Fitting 1.0 mm ID for 0.53 mm ID Capillary Columns	Each	35008429
Terminal Bottom Fitting 0.55 mm ID for 0.25 mm/0.32 mm ID Capillary Columns	Each	35008428
O-ring Parafluor 2-006 for PTV manifold	Pkg of 3	29011310
PTV Injector Head Assembly	Each	40203011



PTVBKF Injector Module Components

The following PTVBKF injector components can be replaced. See Figure 5 and Table 10.

Figure 5. Programmable Temperature Vaporizing Injector for Backflush Components

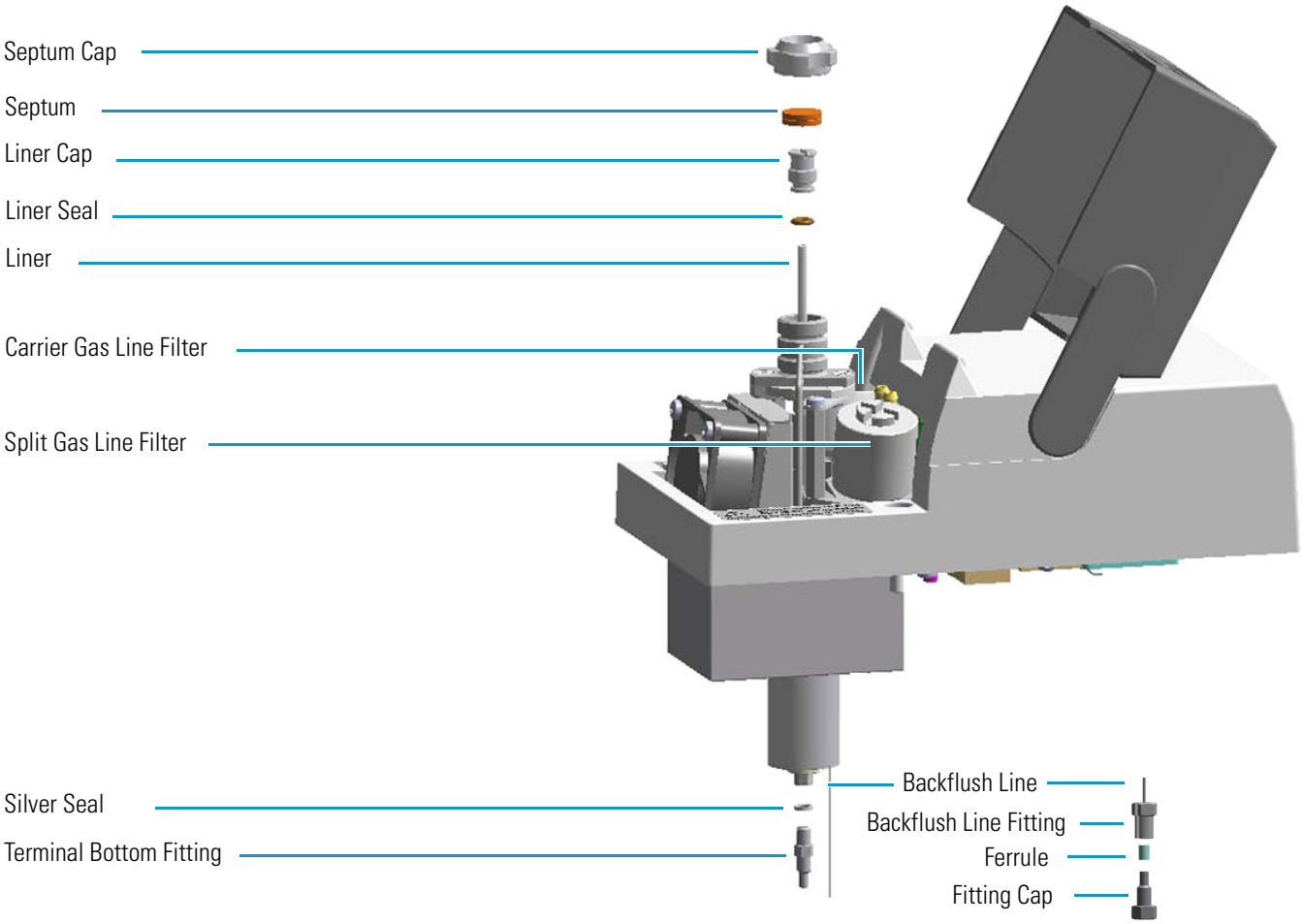


Table 10. PTVBKF Injector Components (Sheet 1 of 2)

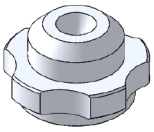
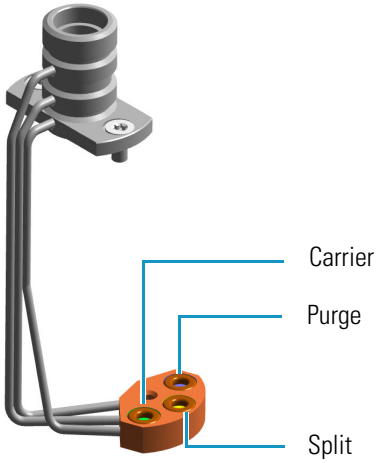
Description		Quantity	Part Number
Septum Cap		Each	35001820
Septum Cap for AI/AS 1310 Autosampler and for HS applications with the TriPlus Autosampler.		Each	35001819
Septum with Center Guide		Pkg of 50	31303233

Table 10. PTVBKF Injector Components (Sheet 2 of 2)

Description	Quantity	Part Number
Liner Cap	Each	29004014
Liner Seal for PTV	Pkg of 5	29001325
Liner See PTV Injector Ports Liner on page 37	Each	
Carrier Line Filter	Each	28113196
Split Line Filter	Each	28113197
Silver Seal	Pkg of 2	29013820
Terminal Bottom Fitting 1.0 mm ID for 0.53 mm ID Capillary Columns	Each	35008429
Terminal Bottom Fitting 0.55 mm ID for 0.25 mm/0.32 mm ID Capillary Columns	Each	35008428
Fitting Cap	Each	35003036
O-ring Parafluor 2-006 for PTV manifold	Pkg of 3	29011310
PTV Injector Head Assembly	Each	40203011



GSV Module Components

The following GSV injector components can be replaced. See Figure 6 and Table 11.

Figure 6. Gas Sampling Valve Module Components

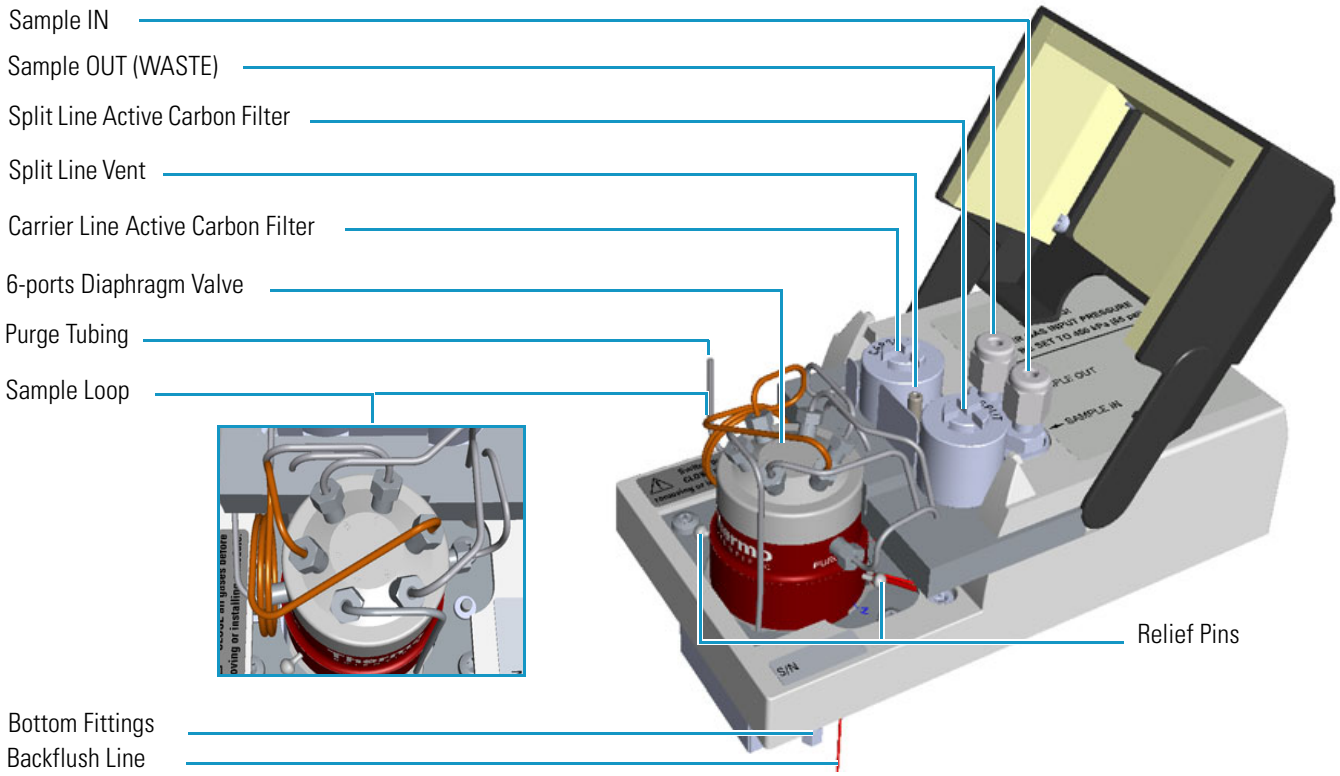


Table 11. Gas Sampling Valve Components (Sheet 1 of 2)

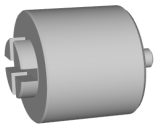
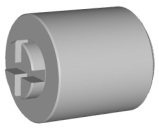
Description		Quantity	Part Number
Carrier Line Filter		Each	28113196
Split Line Filter		Each	28113197
Six-port Diaphragm Valve		Each	40516165

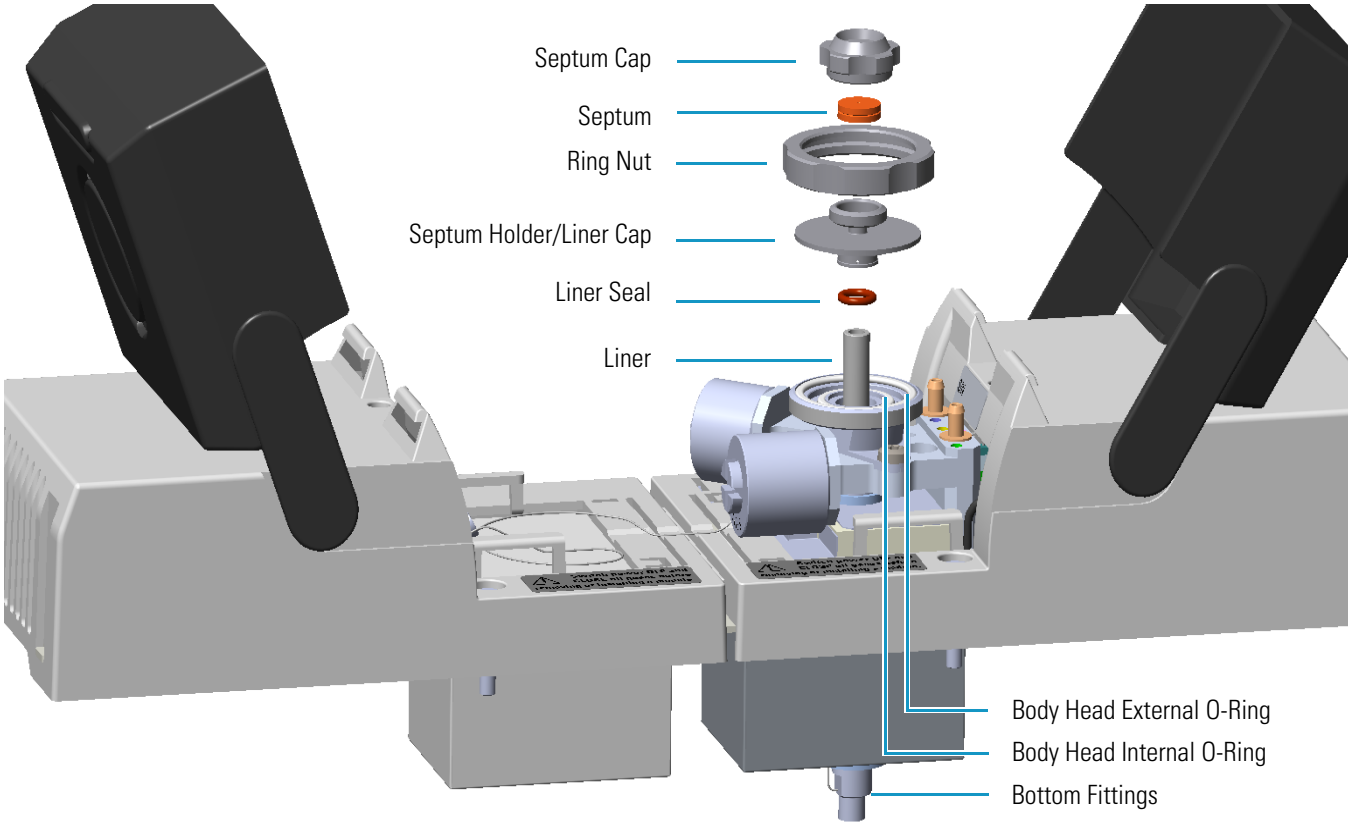
Table 11. Gas Sampling Valve Components (Sheet 2 of 2)

Description		Quantity	Part Number
Kit Sample Loop 20 µL		Each	19071405
Kit Sample Loop 50 µL		Each	19071404
Kit Sample Loop 100 µL		Each	19071403
Kit Sample Loop 250 µL		Each	19071402
Kit Sample Loop 500 µL		Each	19071401
Kit Sample Loop 1000 µL		Each	19071400

Instant Connect Helium Saver Injector Module (HeS-S/SL) Components

The following Instant Connect Helium Saver Injector module (HeS-S/SL) components can be replaced. See Figure 7 and Table 12.

Figure 7. Instant Connect Helium Saver Module: Injector Components



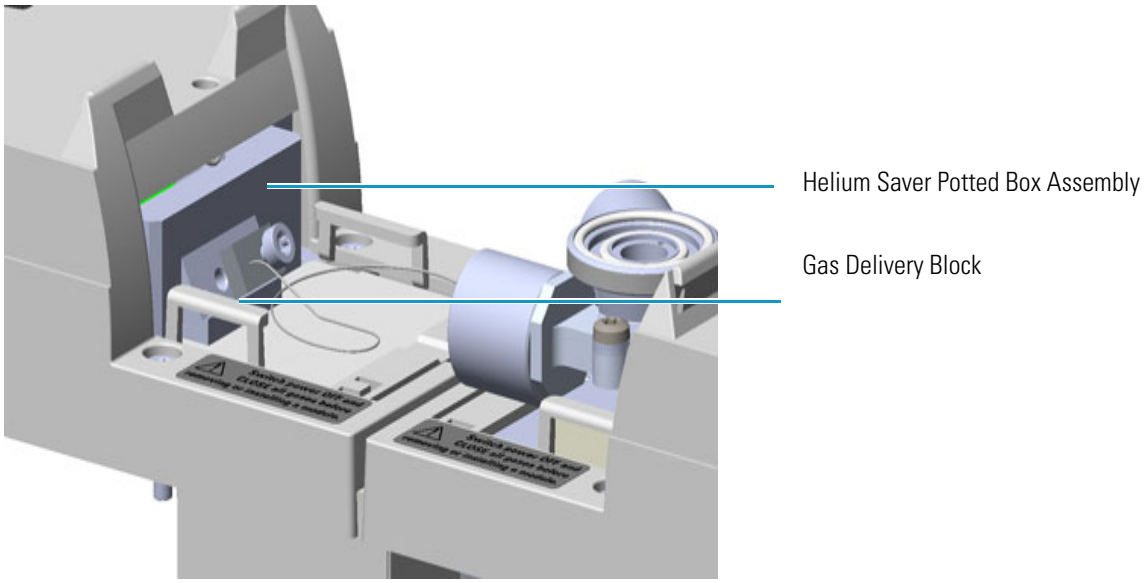


Table 12. Helium Saver S/SL Injector Components (Sheet 1 of 2)

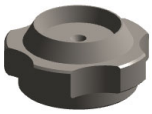
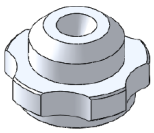
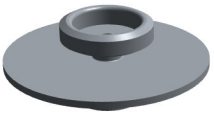
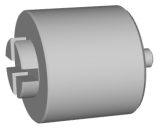
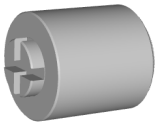
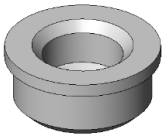
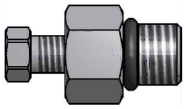
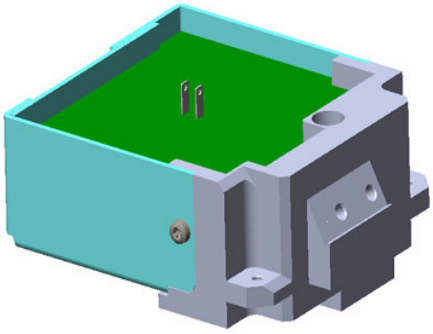
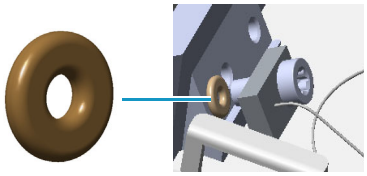
Description		Quantity	Part Number
Septum Cap		Each	35001820
Septum Cap for AI/AS 1310 Autosampler and for HS applications with the TriPlus Autosampler.		Each	35001819
Septum with Center Guide		Pkg of 50	31303233
Ring Nut		Each	35001821
Liner Cap/Septum Holder		Each	40203005
Liner Seal for SSL		Pkg of 5	29001320
Liner See SSL Injector Ports Liner on page 36		Each	
Body Head Internal O-Ring		Each	29001313
Body Head External O-Ring		Each	29001316
Carrier Line Filter		Each	28113196
Split Line Filter		Each	28113197
Bottom Insulator		Each	29004408
O-ring Parafluor 2-006 for SSL manifold		Pkg of 3	29011310

Table 12. Helium Saver S/SL Injector Components (Sheet 2 of 2)

Description	Quantity	Part Number
TRACE 1300 to 1/16-in. Adapter 	Each	35002123
HeS-S/SL Injector Body	Each	24705255
He Saver Potted Box Assembly 	Each	27609926
Gas Delivery Block O-ring 	Pkg of 10	29031303

Injection Port Liners

You can purchase the following injection port liners for the TRACE 1300/TRACE 1310 gas chromatograph. Be sure to reference the part number when placing an order with your local Sales/Service Representative. See the *TRACE 1300/TRACE 1310 User Guide* for information about these liners or Table 2 for a comprehensive list of available components.

- SSL Injector Ports Liner
- PTV Injector Ports Liner

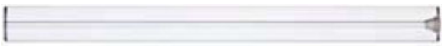
Note Visit www.thermo.com/injection port liners for information about ordering a liner.

The images are not in scale.

SSL Injector Ports Liner

The following SSL injector ports liner can be replaced. See Table 13.

Table 13. SSL Injection Port Liners

Description		Quantity	Part Number
SSL Split Straight Liner, Deactivated, 4 mm ID x 6.3 mm OD x 78.5 mm Length, Quartz Wool		Pkg of 5	453A2265
SSL Split Straight Liner, Deactivated, 4 mm ID x 6.3 mm OD x 78.5 mm Length		Pkg of 5	453A1295
SSL Splitless Liner, Single Taper, Deactivated, 4 mm ID x 6.3 mm OD x 78.5 mm Length, Quartz Wool		Pkg of 5	453A1925
SSL Splitless Liner, Single Taper, 4 mm ID x 6.3 mm OD x 78.5 mm Length		Pkg of 5	453A1345
SSL Direct Straight Liner for HS/SPME, Deactivated, 1.2 mm ID x 6.3 mm OD x 78.5 mm Length		Pkg of 5	453A1335
SSL Mini-LAM Liner, Deactivated, 4 mm ID x 6.3 mm OD x 78.5 mm Length		Pkg of 5	453A2009

PTV Injector Ports Liner

The following PTV injector port liner can be replace. See Table 14.

Table 14. PTV Injection Port Liners

Description	Quantity	Part Number
PTV Siltek Metal Liner, 2 mm ID x 2.75 mm OD x 120 mm Length	Pkg of 2	45322044
PTV Liner, Non-Deactivated, 2 mm ID x 2.75 mm OD x 120 mm Length	Pkg of 5	45322045
PTV Straight Liner, Deactivated, 2 mm ID x 2.75 mm OD x 120 mm Length	Pkg of 5	45352057
PTV Liner, Deactivated, 2 mm ID x 2.75 mm OD x 120 mm Length, Quartz Wool	Pkg of 5	45352070
PTV Siltek Metal Liner, 1.3 mm ID x 2.75 mm OD x 120 mm Length	Each	45322046
PTV Straight Liner, Deactivated, 1 mm ID x 2.75 mm OD x 120 mm Length	Pkg of 5	45352054
PTV Siltek Metal Liner, 2 mm ID x 2.75 mm OD x 120 mm Length, Silica Wool	Each	45322056
PTV Liner with Sintered, Deactivated 2 mm ID x 2.75 mm OD x 120 mm Length	Pkg of 5	45352060
PTV Liner with Three Baffles, Deactivated, 1 mm ID x 2.75 mm OD x 120 mm Length	Pkg of 5	45352062
PTV Baffle Liner (Siltek), Deactivated, 2 mm ID x 2.75 mm OD x 120 mm Length	Pkg of 5	453T2120
PTV Silcosteel Liner Simile OC, 1 mm ID x 2.75 mm OD x 120mm Length with 0.6 mm ID Restriction	Each	45322052

Detector Modules Components

You can purchase the following components for the detector modules. Be sure to reference the component's part number when placing an order with your local Sales/Service Representative. See the *TRACE 1300 and TRACE 1310 Hardware Manual* for information about installing these components or Table 2 for a comprehensive list of available components.

The following Detector modules components can be replaced on the TRACE 1300/TRACE 1310.

- FID Detector Module Components
- NPD Detector Module Components
- ECD Detector Module Components
- TCD Detector Modules Components
- FPD Detector Module Components
- PDD Detector Module Components
- GDI Generic Detector Interface Components

Note The images are not in scale.

FID Detector Module Components

The following FID detector components can be replaced. See Figure 8 and Table 15.

Figure 8. Flame Ionization Detector Components

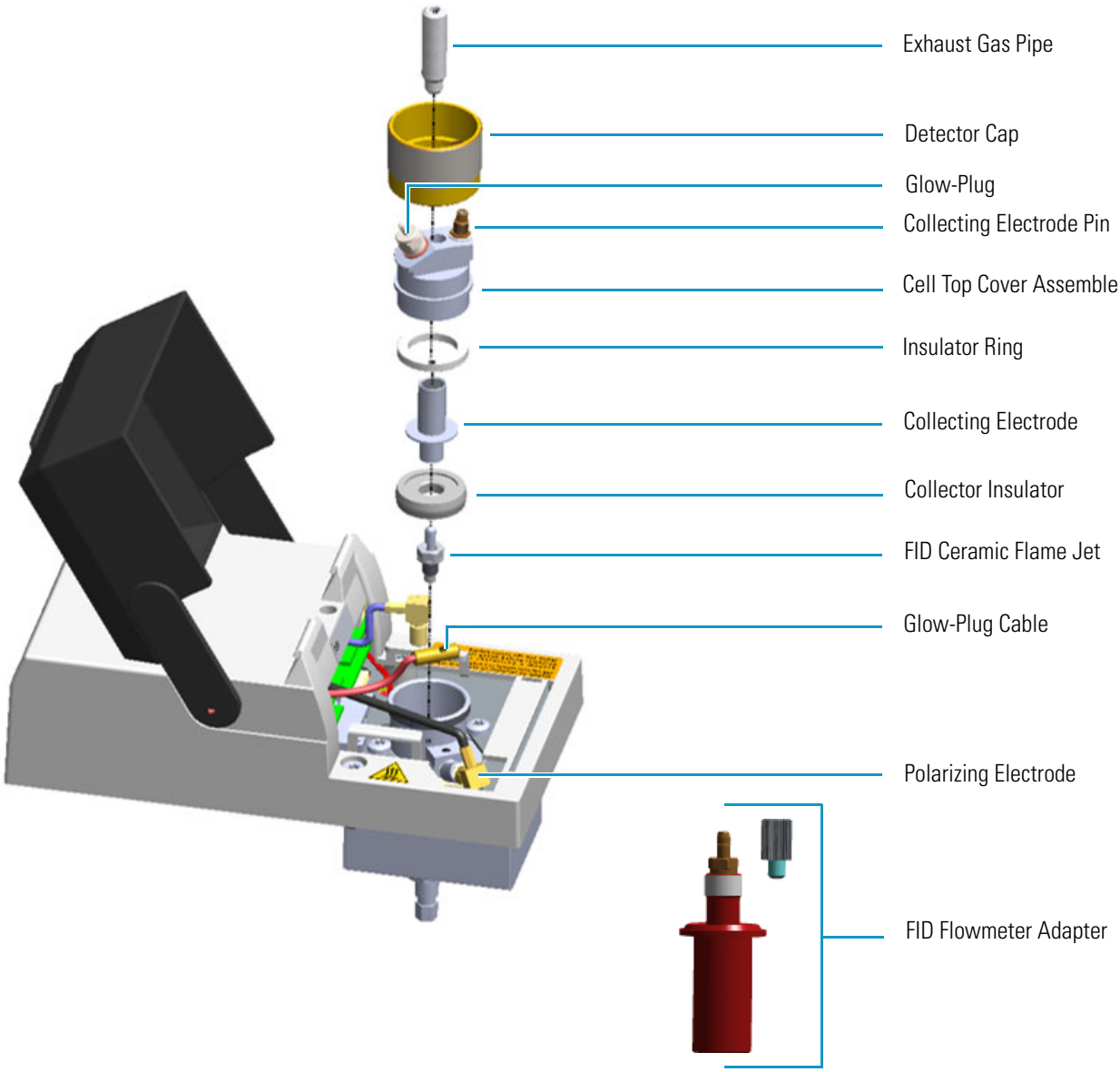
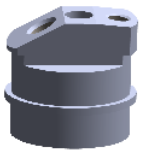
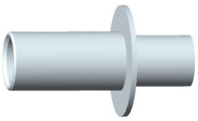
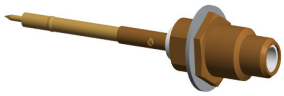
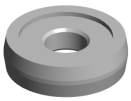
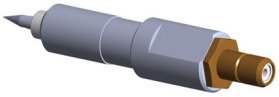
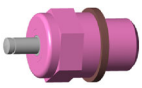
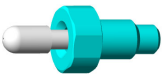
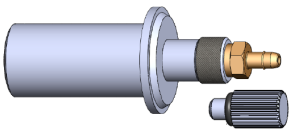
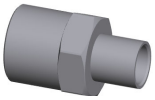


Table 15. FID Detector Components (Sheet 1 of 2)

Description		Quantity	Part Number
FID Exhaust Gas Pipe		Each	MI-897301901

Table 15. FID Detector Components (Sheet 2 of 2)

Description	Quantity	Part Number
FID Detector Cap	Each	35001124
FID Cell Top Cover (Top Body) 	Each	24705245
FID Insulator Ring	Each	29004612
FID Collecting Electrode 	Each	27700900
FID Collecting Electrode Pin 	Each	20601604
FID Collector Insulator 	Each	30202400
FID Polarizing Electrode 	Each	27702330
FID/FPD Glow-Plug (Igniter) 	Each	40303535
FID Glow-Plug Cable	Each	23043717
FID Ceramic Flame Jet 	Each	40402200
FID Measuring Tool Flowmeter Adapter 	Each	34709348
Retaining Nut (for Column Adapter) 	Each	35001126
FID Test Mixture	Each	33819020

NPD Detector Module Components

The following NPD detector components can be replaced. See Figure 9 and Table 16.

Figure 9. Nitrogen Phosphorus Detector Components

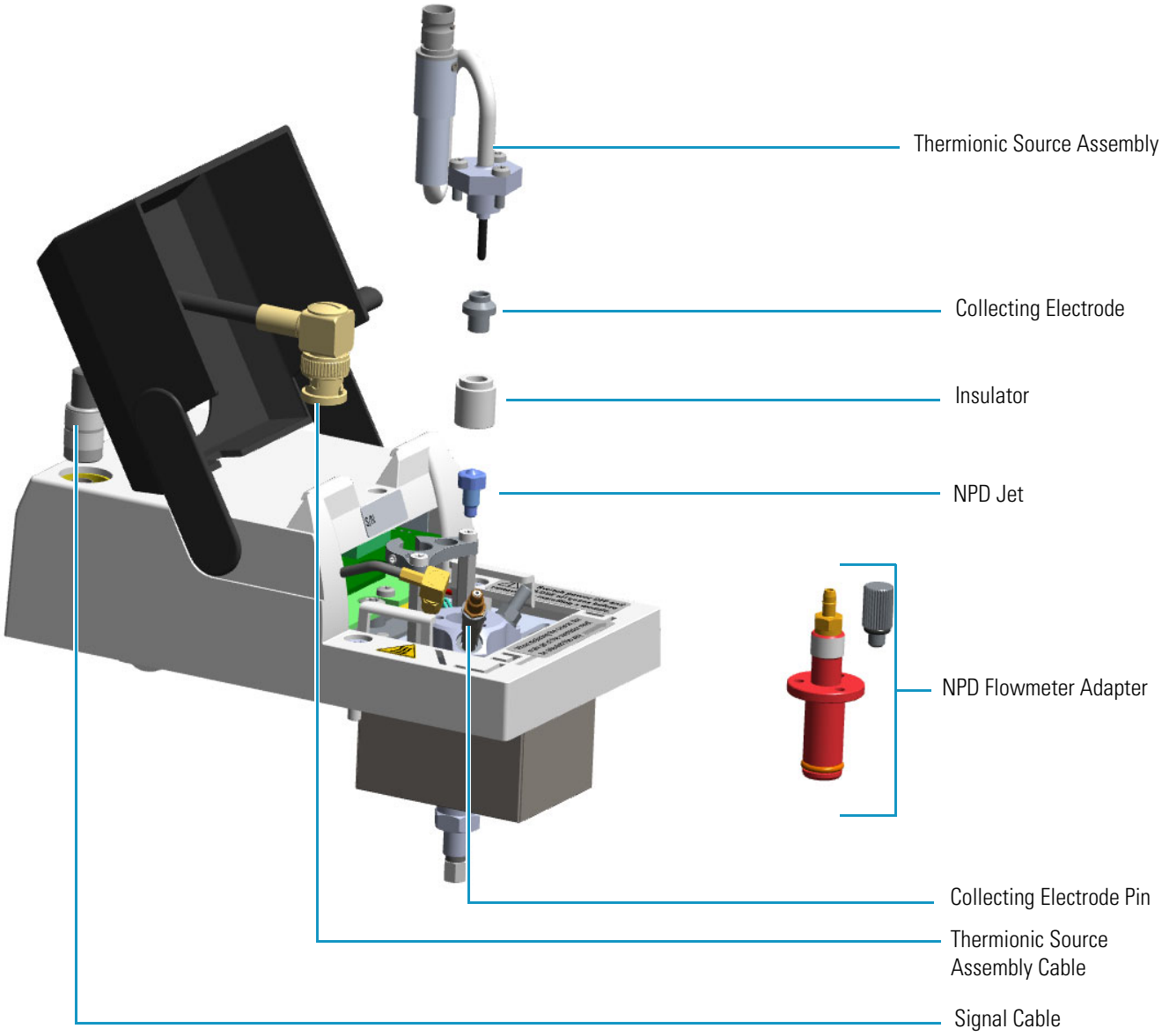


Table 16. NPD Detector Components (Sheet 1 of 2)

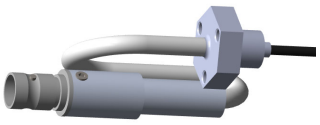
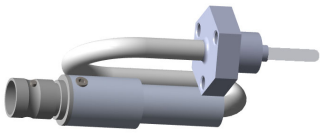
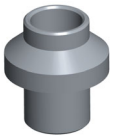
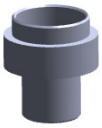
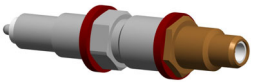
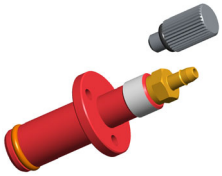
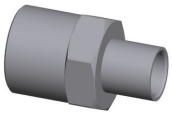
Description	Quantity	Part Number
NPD Thermionic Source TID 2 (Black ceramic) for both Nitrogen and Phosphorous detections. **Note** This thermionic source is provided as standards with the NPD detector module. 	Each	46500256

Table 16. NPD Detector Components (Sheet 2 of 2)

Description	Quantity	Part Number
NPD Thermionic Source TID 4 (White ceramic) for enhanced Nitrogen response. 	Each	46500257
NPD Thermionic Source Fixing Screw	Pkg of 5	40921705
NPD Collecting Electrode 	Each	27701600
NPD Collecting Electrode (for BLOS Type Thermionic Source) 	Each	27701605
NPD Collecting Electrode Pin 	Each	20604305
NPD Collecting Insulator (for DET Type Thermionic Source)	Each	30202405
NPD Jet	Each	40404516
NPD Measuring Tool Flowmeter Adapter 	Each	34709610
Retaining Nut (for Column Adapter) 	Each	35001126
NPD Test Mixture	Each	33819006

ECD Detector Module Components

The following ECD detector components can be replaced. See Figure 10 and Table 17.

Figure 10. Electron Capture Detector Components

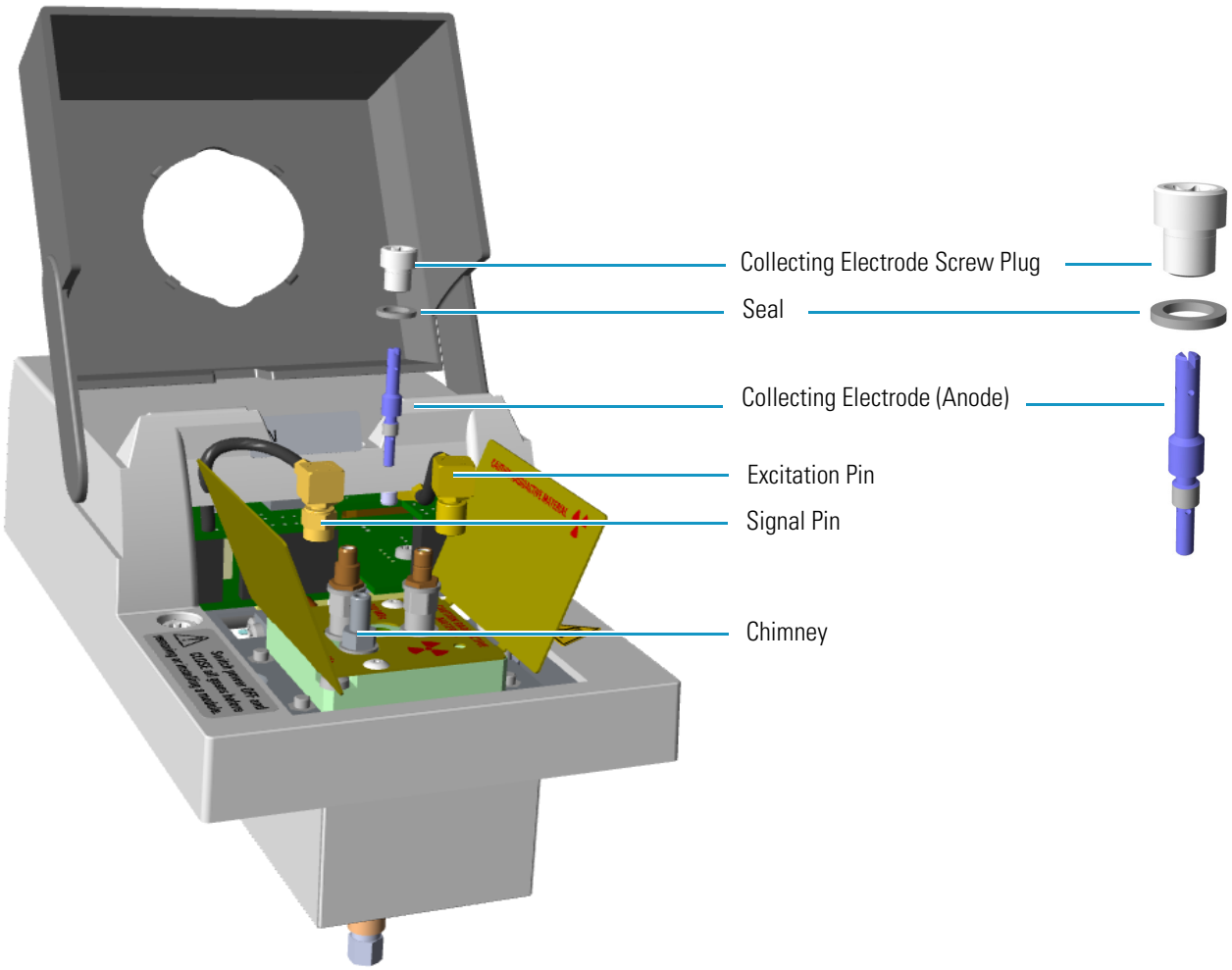


Table 17. ECD Detector Components (Sheet 1 of 2)

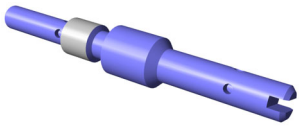
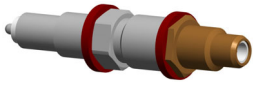
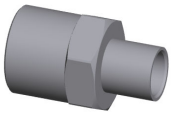
Description		Quantity	Part Number
ECD Collecting Electrode (Anode)		Each	21600210
ECD Collecting Electrode (Anode) Screw		Each	35006118

Table 17. ECD Detector Components (Sheet 2 of 2)

Description	Quantity	Part Number
ECD Collecting Electrode Seal	Pkg of 10	29032608
ECD Collecting Electrode Pin 	Each	20604305
Retaining Nut (for Column Adapter) 	Each	35001126
ECD Test Mixture	Each	33819011

TCD Detector Modules Components

The following TCD detector components can be replaced. See Figure 11 and Table 18.

Figure 11. Thermal Conductivity Detector Components

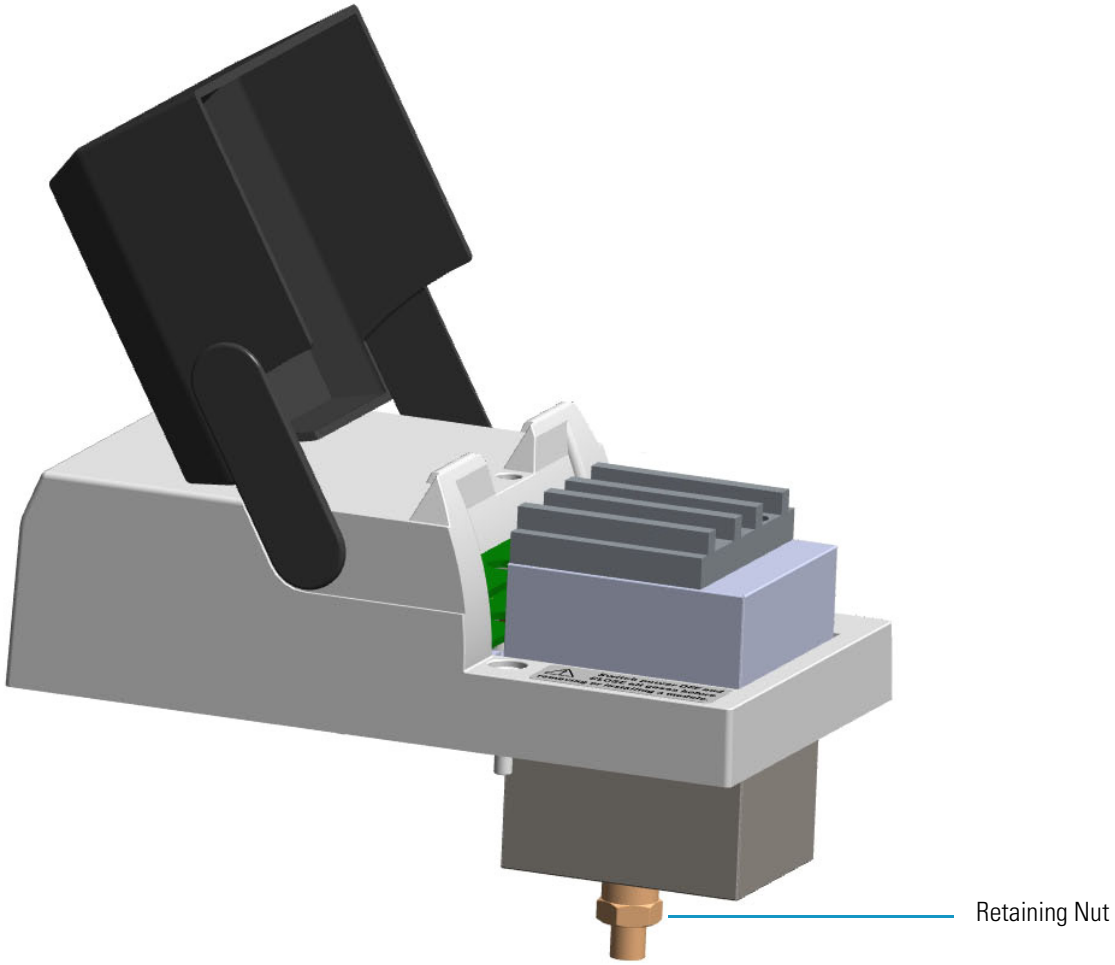
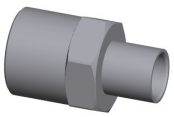


Table 18. TCD Detector Components

Description		Quantity	Part Number
Retaining Nut (for Column Adapter)		Each	35001126
TCD Test Mixture		Each	33819016

FPD Detector Module Components

The following FPD detector components can be replaced. See Figure 12, Figure 13, Figure 14, and Table 19.

Figure 12. Flame Photometric Detector Module

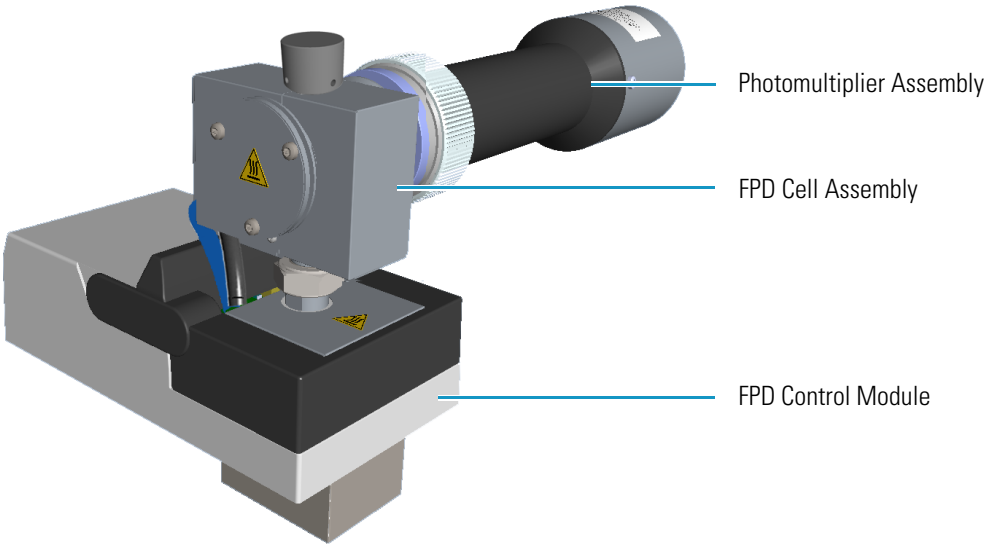
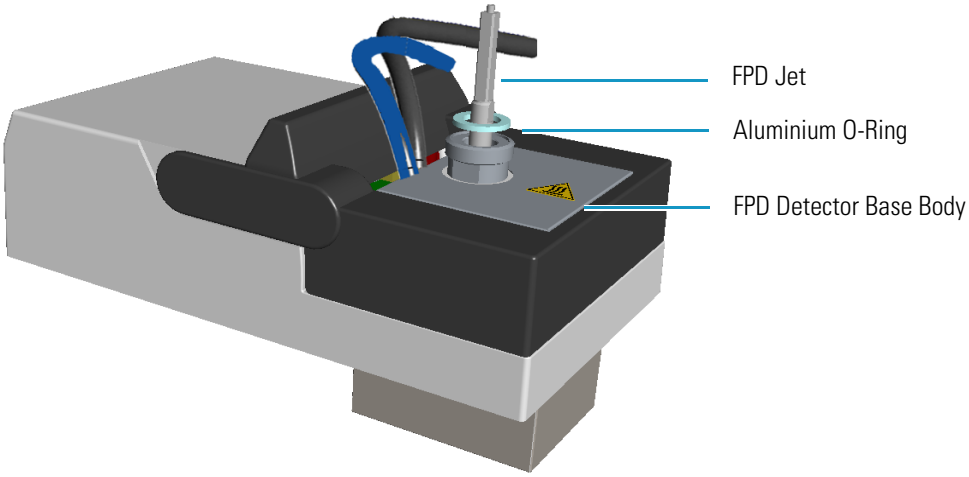
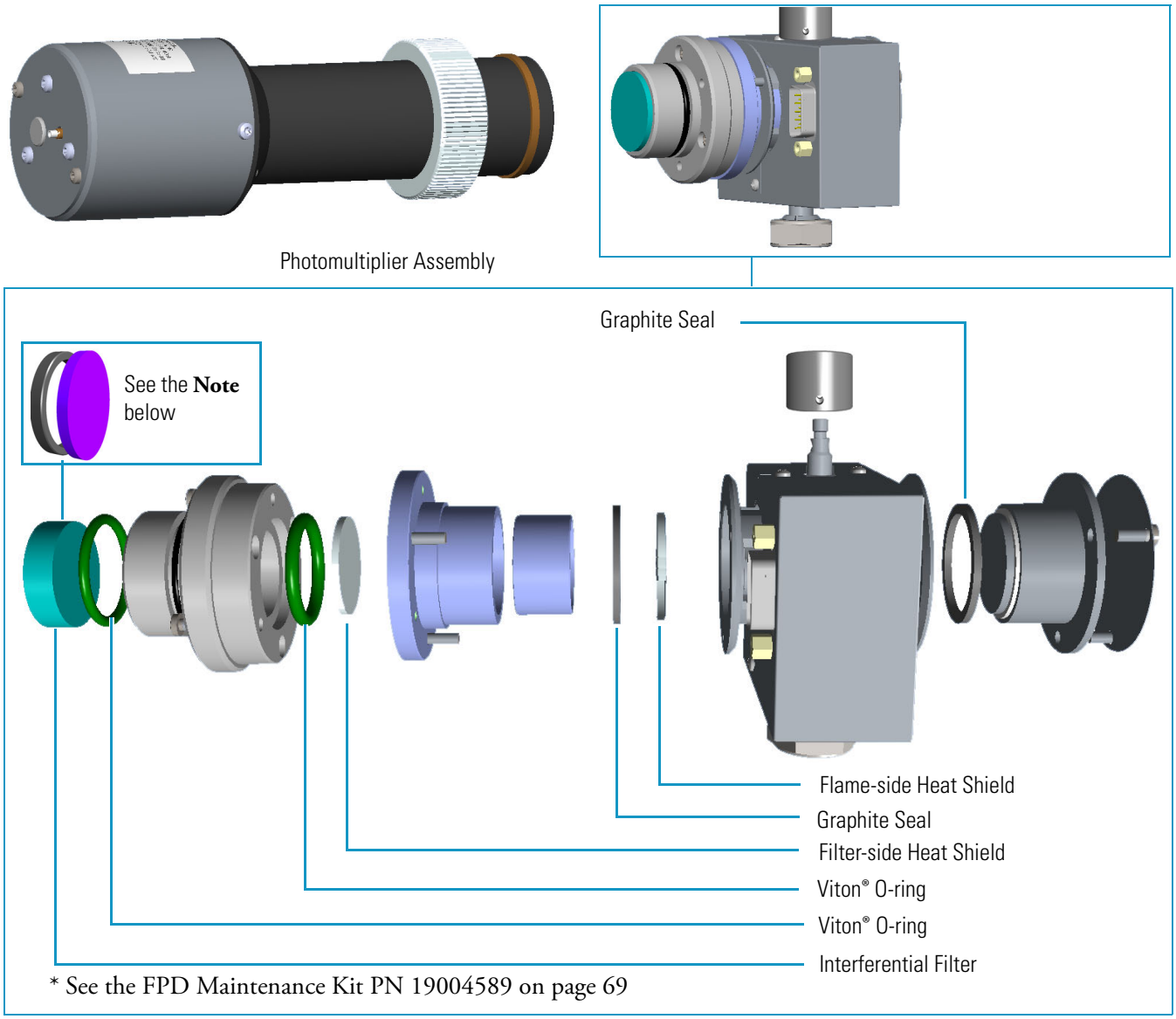


Figure 13. FPD Control Module Components



Note The signal, excitation voltage, and ignition/heating cables will not be shown in the next illustrations for graphic convenience.

Figure 14. FPD Cell Assembly Components



Note Instead of the filters PN 28107000 and PN 28107100, a new type of interferential filters for sulfur and phosphorous are available as kit:

- PN 19050785 includes an interferential filter for sulfur (PN 28107101) and a spacer.
- PN 19050786 includes an interferential filter for phosphorous (PN 28107102) and a spacer.

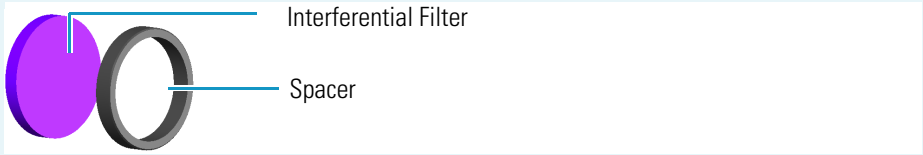
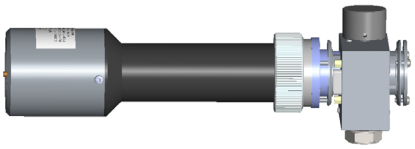
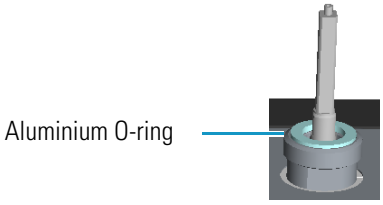
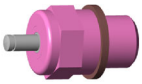
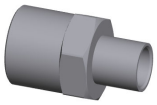
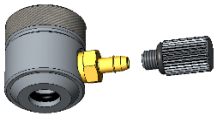


Table 19. FPD Detector Components

Description	Quantity	Part Number
FPD Detector Assembly 	Each	29903110
Kit FPD Interferential Filter for Sulfur (28107101 + Spacer)	Each	19050785
Kit FPD Interferential Filter for Phosphorus (28107102 + Spacer)	Each	19050786
FPD Interferential Filter for Sulfur	Each	28107000
FPD Interferential Filter for Phosphorus	Each	28107100
FPD Interferential Filter for Tin	Each	28107001
FPD Jet Deactivated Silcosteel	Each	40404518
FPD Aluminium O-ring 	Pkg of 10	29032630
FPD Photomultiplier Tube	Each	28600460
FID/FPD Glow-Plug (Igniter) 	Each	40303535
Retaining Nut (for Column Adapter) 	Each	35001126
FPD Measuring Tool Flowmeter Adapter 	Each	34709630
FPD Detector Fixing Tool (20-22 mm wrench)	Each	20501608
FPD Test Mixture	Each	33819006

PDD Detector Module Components

The following PDD detector components can be replaced. See Figure 15, Figure 16, and Table 20.

Figure 15. Pulsed Discharge Detector Module

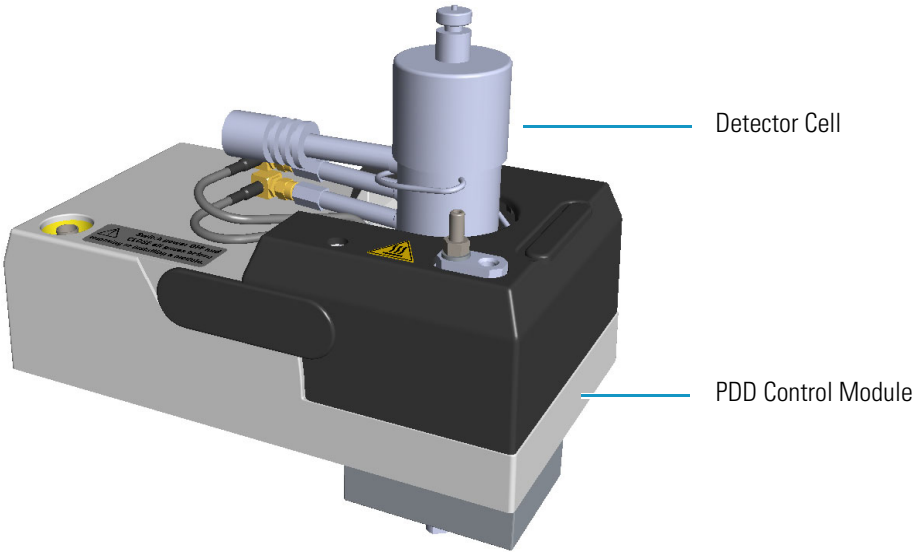


Figure 16. PDD Pulse Generator

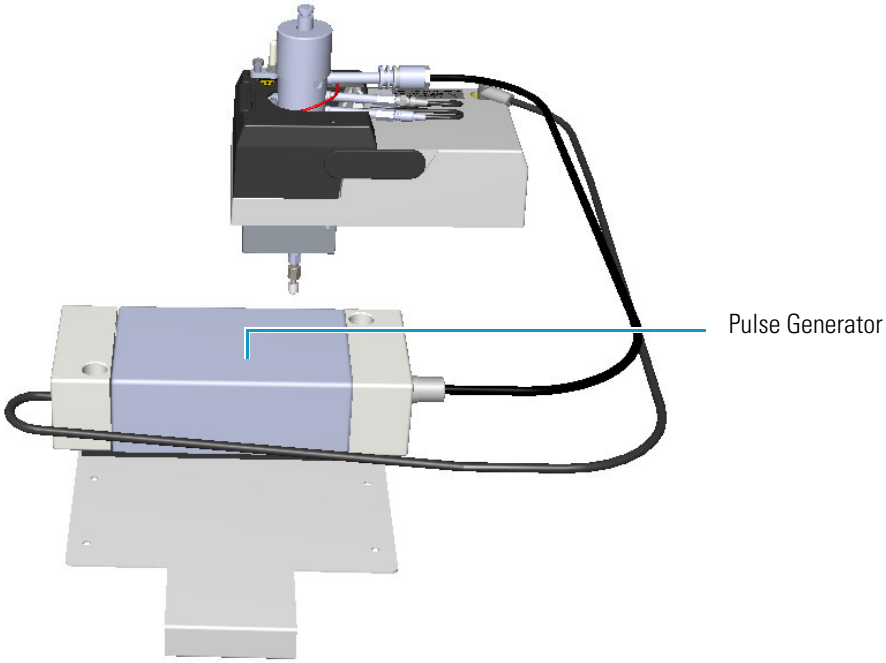
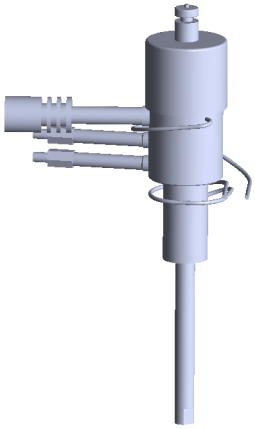
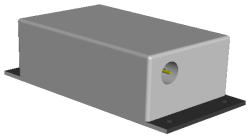


Table 20. PDD Detector Components

Description	Quantity	Part Number
PDD Cell 	Each	41910716
PDD Pulse Generator (Pulser) 	Each	43210075
PDD Purifier Assy	Each	43210076
PDD Mini Helium Purifier Kit	Each	19071500
PDD Flow Restrictor	Each	24505908
PDD Packed Column Adapter	Each	26060521
PDD Test Mixture	Each	33819032

GDI Generic Detector Interface Components

The following GDI Generic Detector Interface components present into the GDI electrical interface can be replaced. See Figure 17, and Table 21.

Figure 17. GDI Electrical Interface

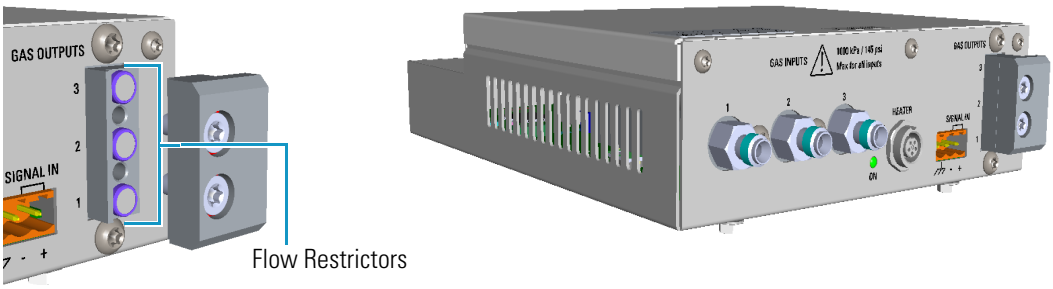


Table 21. GDI Generic Detector Interface Components

Description		Quantity	Part Number
Low Flow Restrictor		Each	24503330
Medium Flow Restrictor		Each	24503333
High Flow Restrictor		Each	24503334

Upgrade Modules

The following upgrade modules are available for the TRACE 1300/TRACE 1310. See Table 22.

Contact your local Sales/Service Representative to place an order. Once you receive the module, refer to the *TRACE 1300 and TRACE 1310 Hardware Manual* for installation information or Table1 for a comprehensive list of available components.

Note The images are not in scale.

Table 22. Module (Sheet 1 of 4)

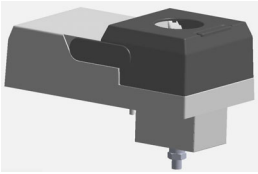
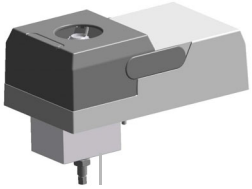
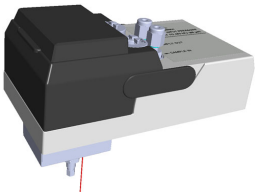
Description		Quantity	Part Number
Dummy Module		Each	19070097
SSL Injector Module		Each	19070010
SSLBKF Injector Module		Each	19070011
Gas Sampling Valve Module		Each	19070095
Helium Saver S/SL Module		Each	19070013

Table 22. Module (Sheet 2 of 4)

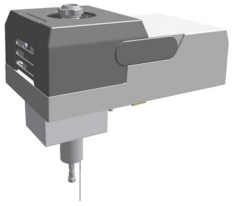
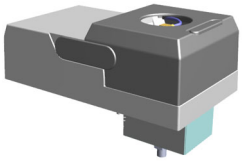
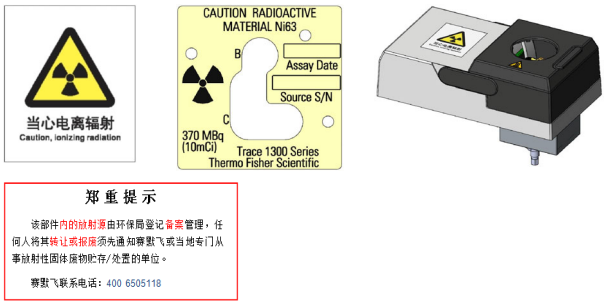
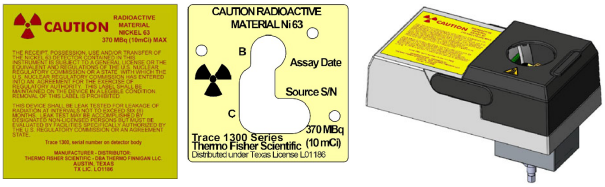
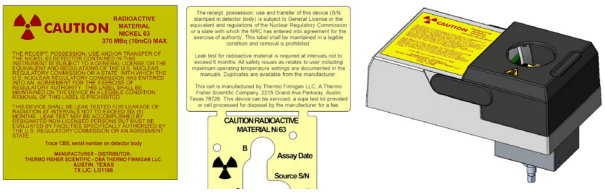
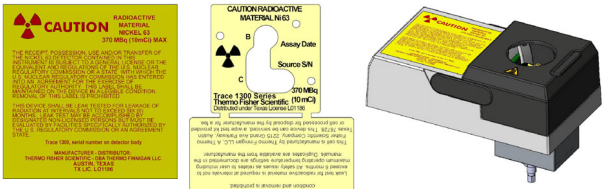
Description		Quantity	Part Number
PTV Injector Module		Each	19070020
PTVBKF Injector Module		Each	19070021
FID Detector Module		Each	19070001
ECD Detector Module for China Market		Each	19070029
ECD Detector Module for International Market		Each	19070030
ECD Detector Module for USA Market (General License)			19070031
ECD Detector Module for USA Market (Specific License)			19070032

Table 22. Module (Sheet 3 of 4)

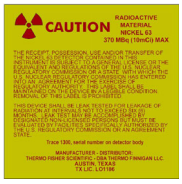
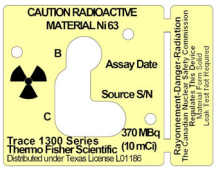
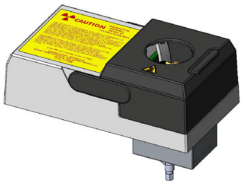
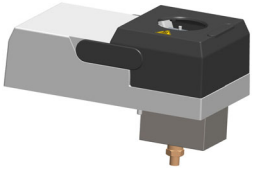
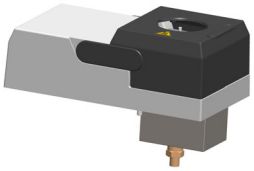
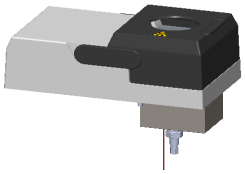
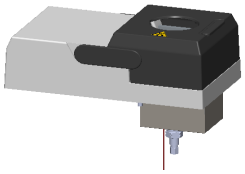
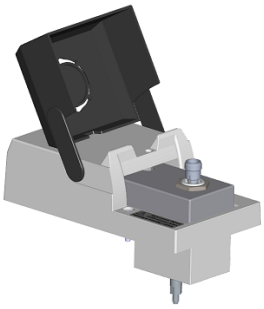
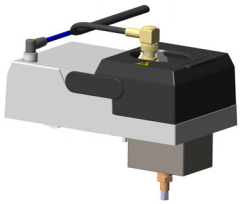
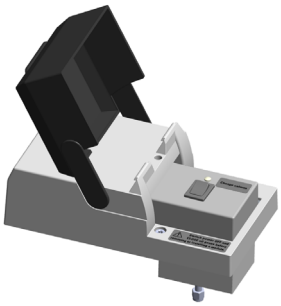
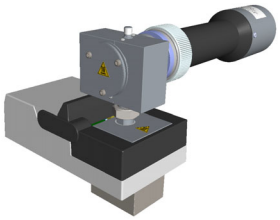
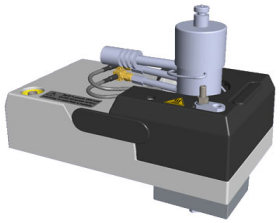
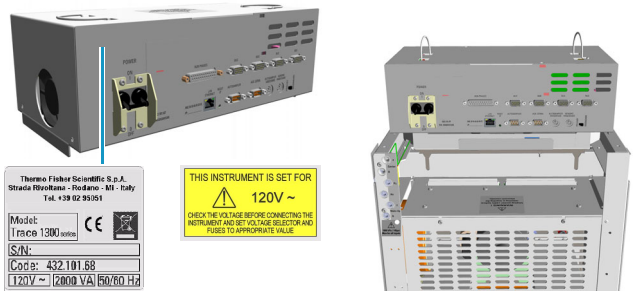
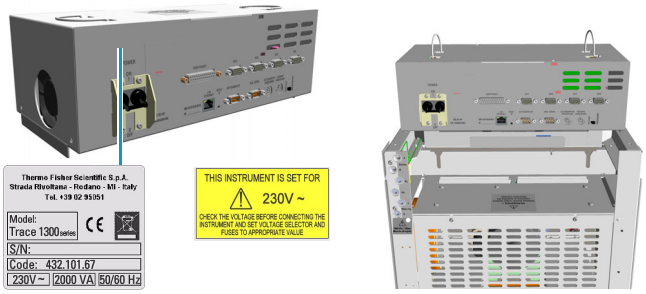
Description	Quantity	Part Number
ECD Detector Module for Canada Market   		19070033
TCD Detector Module with Nickel-Iron (Ni-Fe) filament cell 	Each	19070040
TCD Detector Module with Tungsten-Rhenium (W-Re) filament cell 	Each	19070041
In-Series Connection TCD Detector Module with Nickel-Iron (Ni-Fe) filament cell 	Each	19070045
In-Series Connection TCD Detector Module with Tungsten-Rhenium (W-Re) filament cell 	Each	19070046
FTIR Make-up Module 	Each	19070050
NPD Detector Module 	Each	19070060

Table 22. Module (Sheet 4 of 4)

Description		Quantity	Part Number
No Vent Microfluidics Module		Each	19070090
FPD Detector Module		Each	19070096
PDD Detector Module		Each	19070014
AOI Analog Output Interface Module		Each	19070022
Electronic Module 120 Vac		Each	43210168
Electronic Module 230 Vac		Each	43210167

Electronic Module Boards

You can purchase the following boards for the electronic module of the TRACE 1300/TRACE 1310 gas chromatograph. See Table 23.

Be sure to reference the component's part number when placing an order with your local Sales/Service Representative.

Note The images are not in scale.

Table 23. Electronic Board (Sheet 1 of 2)

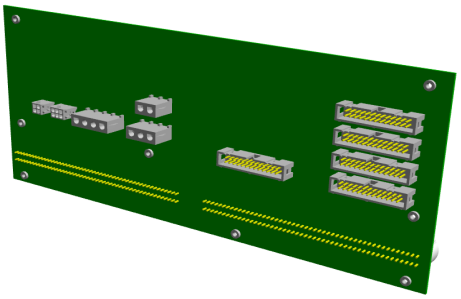
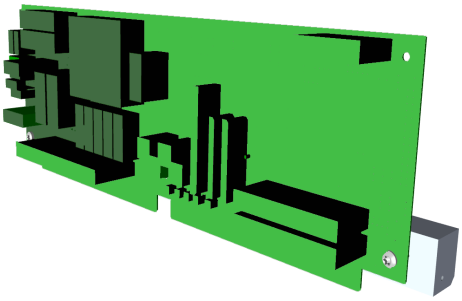
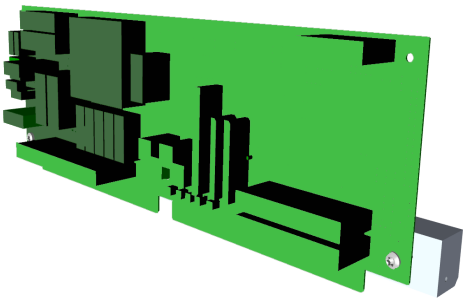
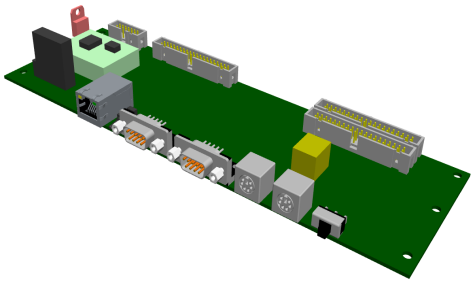
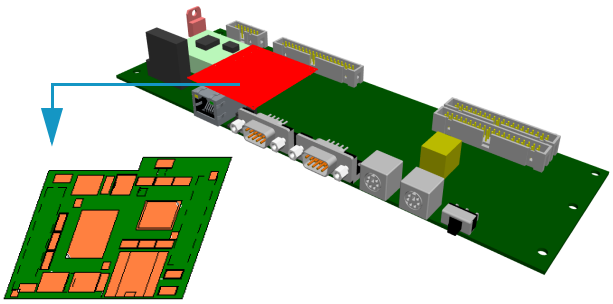
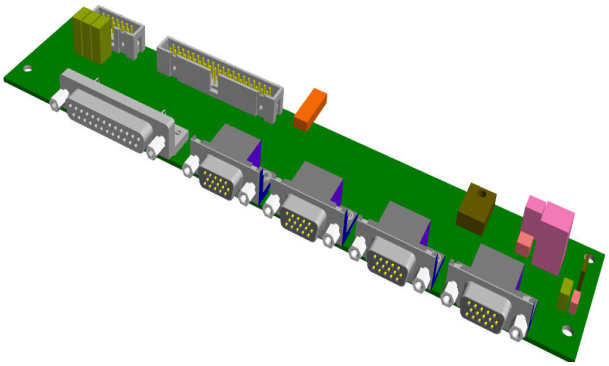
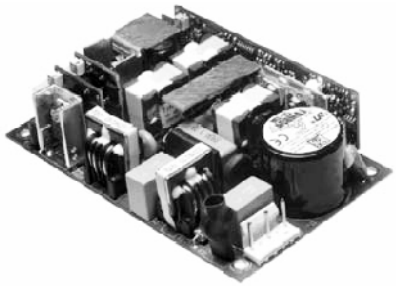
Description		Quantity	Part Number
Rear Backplane Board (BKP-HRM; PC1256)		Each	23661000
Oven CPU and Power Control Board (OVN-HRM; 230 V; PC1257)		Each	23661010
Oven CPU and Power Control Board (OVN-HRM; 120V; PC1257-01)		Each	23661011

Table 23. Electronic Board (Sheet 2 of 2)

Description		Quantity	Part Number
Main CPU Board (CPU-HRM; PC1258)		Each	23661015
Memory Board (MEM-HRM; PC1259)		Each	23661020
External Interface Board (EXT-HRM; PC1263)		Each	23661025
Power Supply Board		Each	20806090

External Modules

The following external modules are available for the TRACE 1300/TRACE 1310. See Table 24.

Contact your local Sales/Service Representative to place an order. Once you receive the module, refer to the *TRACE 1300 and TRACE 1310 Hardware Manual* for installation information.

Note The images are not in scale.

Table 24. External Modules

Description		Quantity	Part Number
Aux Temperature/Cryo Module		Each	19070070
Auxiliary Gases Module		Each	19070080
NPD Thermionic Source Power Module		Each	43215010

Cryo Components

The following cryogenic components are available for the TRACE 1300/TRACE 1310. See Table 25.

Contact your local Sales/Service Representative to place an order. Once you receive the module, refer to the *TRACE 1300 and TRACE 1310 Hardware Manual* for installation information.

Note The images are not in scale.

Table 25. Cryo Components

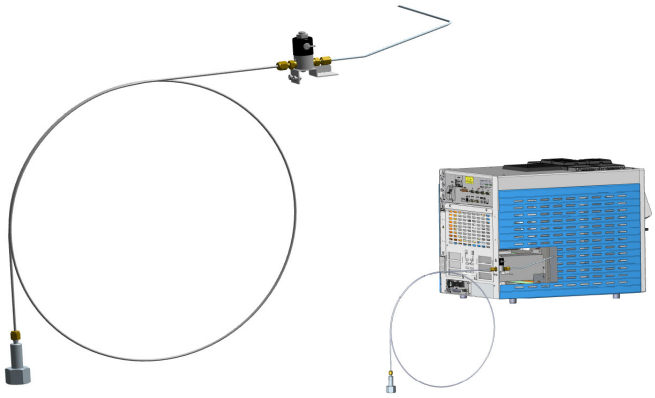
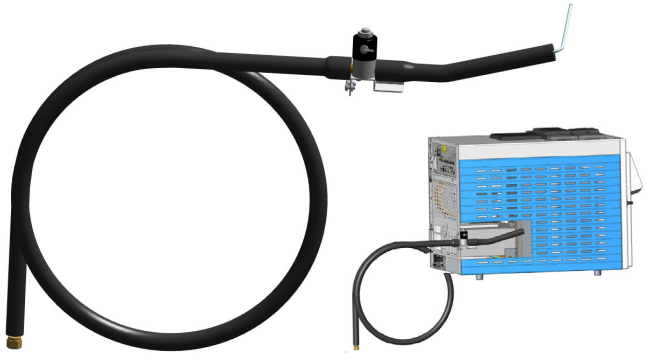
Description	Quantity	Part Number
Oven Cryo CO_2 Assemble 	Each	19050753
Oven Cryo N_2 Assemble 	Each	19050752

Table 25. Cryo Components

Description		Quantity	Part Number
PTV Cryo CO_2 Assemble		Each	19050755
PTV Cryo N2 Assemble		Each	19050754

Kits & Miscellanea

The following kits, cables, and miscellanea are available for the TRACE 1300/TRACE 1310. See Table 26.

Contact your local Sales/Service Representative to place an order. Once you receive the kit, refer to the *TRACE 1300 and TRACE 1310 Hardware Manual* for installation information.

Note The images are not in scale.

Table 26. Kits and Miscellanea

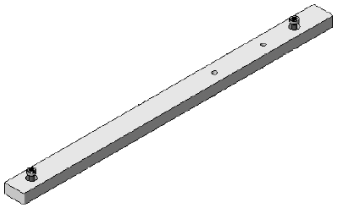
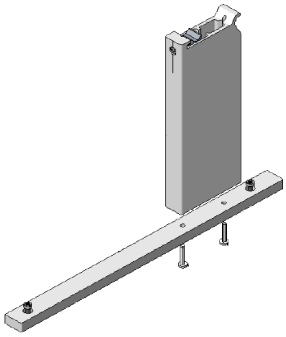
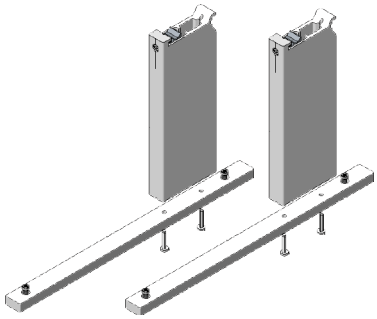
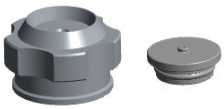
Description		Quantity	Part Number
TriPlus Leg Support for TRACE 1300/1310		Pkg of 2	19050489
TriPlus RSH Mounting Leg		Pkg of 1	1R77010-1066
TriPlus RSH Mounting Kit		Pkg of 2	1R77010-1005
Merlin Valve Kit The Kit includes: Merlin Microseal High Pressure Valve Septum Cap		Each	19050735

Table 26. Kits and Miscellanea

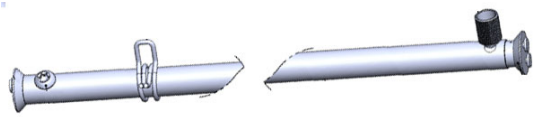
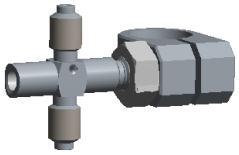
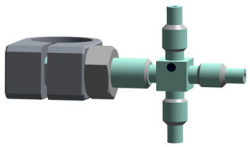
Description	Quantity	Part Number
Clamp Bracket for Backflush Kit 	Each	19050757
Packed Column Adapters Kit The Kit includes: Adapter for the connection of the 1/8-inch OD packed column to the SSL injector. Adapter for the connection of the 1/16-inch OD packed column to the SSL injector. Adapter for the connection of the 1/8-inch OD packed column to the FID, NPD, ECD, TCD, or FPD detector. Adapter for the connection of the 1/16-inch OD packed column to the FID, NPD, ECD, TCD, or FPD detector. 1/4”- 1/16”wrench 4.5 mm wrench	Each	19050758
Graph-pack (Encapsulated Graphite) Ferrules Kit The Kit includes: Adapter for the connection to the SSL injector Adapter for the connection to the FID, NPD, ECD, TCD, or FPD detector	Each	19050759
Oven Exhaust Kit	Each	19050760
Tee Connector for Holder Kit 	Each	19050251
Tee Connector Kit for High Temperature 	Each	19050254

Table 26. Kits and Miscellanea

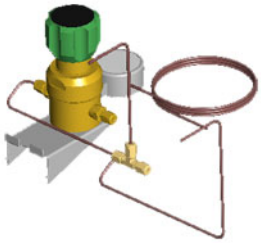
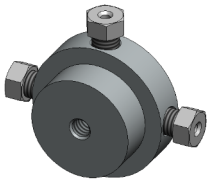
Description		Quantity	Part Number
Packed Column Adapters Kit for Gas Sampling Valve The Kit includes: AAdapter for the connection of the 1/8-inch OD packed column to the FID, NPD, ECD, TCD, or FPD detector. Adapter for the connection of the 1/16-inch OD packed column to the FID, NPD, ECD, TCD, or FPD detector. 4.5 mm wrench Open ended wrench 1/4-5/16-inch		Each	19050762
Pressure Regulator Kit for Gas Sampling Valve		Each	19050763
Kit Backflush for Gas Sampling Valve		Each	19050764
SSL/SSLBKF/HeS-S/SL Maintenance Kit	The Kit includes: 19050771 SSL O-Ring Kit 28113197 Split Line Filter 290GA082 Base Seal 31303246 Septum BTO with Center Guide (Pkg of 5) 453A1925 SSL Splitless Liner (Pkg of 1)	Each	19050770
SSL/SSLBKF/HeS-S/SL O-Ring Kit	The Kit includes: 29001312 Liner Seal 29001313 Body Head Internal O-ring 29001316 Body Head External O-ring 29011310 Manifold O-rings (Pkg of 3)	Each	19050771
FID Igniter Kit	The Kit includes: 40303535 FID/FPD Glow-Plug (Igniter) 20601604 FID Collecting Electrode Pin 24705245 FID Cell Top Cover Assemble	Each	19050775

Table 26. Kits and Miscellanea

Description		Quantity	Part Number
FID Maintenance Kit	The Kit includes: 40402200 FID Ceramic Flame Jet 29004612 FID Insulator Ring (Top) 30202400 FID Collector Insulator (Bottom) 40303535 FID/FPD Glow-Plug (Igniter)	Each	19050776
NPD Maintenance Kit	The Kit includes: 40404516 NPD Jet 30202405 NPD Collector Insulator 27701600 NPD Collecting Electrode	Each	19050777
ECD Collecting Electrode (Anode) Replacement Kit	The Kit includes: 29002608 ECD Collecting Electrode (Anode) Seal (Pkg of 1) 21600210 ECD Collecting Electrode (Anode)	Each	19050779
ECD Exhaust Vent Kit	The Kit includes: 29002608 Aluminium Washer 42010022 Silicone Rubber Tubing Fitting M5	Each	19070024
FPD Maintenance Kit	The Kit includes: 29003414 Graphite Seal (Pkg of 2) 45101750 Heat Shield (Pkg of 1) 29000050 Viton O-ring 29000381 Viton O-ring	Each	19004589
PTV/PTVBKF Maintenance Kit	The Kit includes: 31303246 Septum BTO with Center Guide (Pkg of 5) 45302044 Splitless, Silcosteel Deactivated, 2 mm ID (Pkg of 1) 29001318 Liner Seal 28113197 Split Line Filter 29011310 Head O-Ring (Pkg of 3)	Each	19050780
Dual Detector Microfluidics Kit	The Kit includes: 19098026 Microfluidics Kit 19050757 Clamp Bracket for Backflush Kit 31608055 Clamp Assembly	Each	19071030

Table 26. Kits and Miscellanea

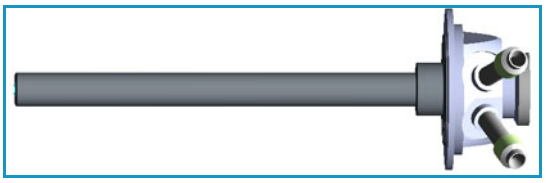
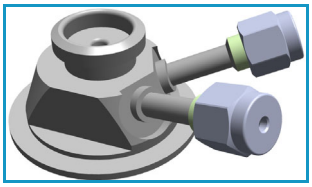
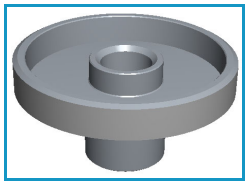
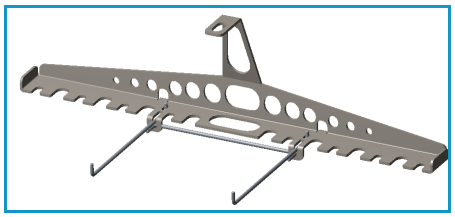
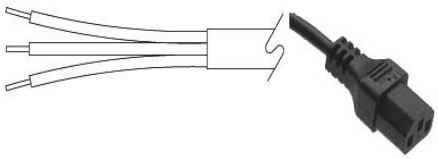
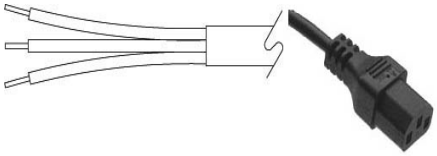
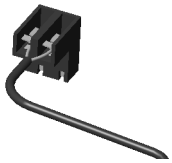
Description		Quantity	Part Number
SSL/SSLBKF Hot Injection Adapter		Each	19050733
Generic Detector Interface Kit	The Kit includes: 29903130 GDI Detector Module 29903131 GDI Control Module	Each	19070015
Purge & Trap Adapter Kit		Each	19050730
SSL Liner O-ring (for Purge & Trap Adapter)		Each	MI-290AA1-0001
SSL Adapter Head for PerkinElmer TurboMatrix™ HS		Each	34709361
Packed Columns Support Kit		Each	19070124
Power Cable 16 A, 230 V		Each	23033025
Power Cable 20A, 120 V		Each	23033030

Table 26. Kits and Miscellanea

Description		Quantity	Part Number
LAN Communication Pin-to-Pin Cable		Each	23043592
LAN Communication Cross Cable		Each	23043593
EV Helium Saver Connection Cable		Each	23043731
MS Start Cable		Each	23043546

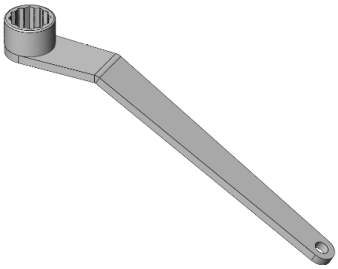
Tools

The TRACE 1300/TRACE 1310 ships with the tools you will need to perform maintenance on the instrument. See Table 27.

Contact your local Sales/Service Representative to place an order.

Note The images are not in scale.

Table 27. Tools

Description		Quantity	Part Number
Ceramic Column Cutter	ThermoFisher SCIENTIFIC www.thermofisher.com	Each	60201-318
USB Oven Light (for TRACE 1310 Only)		Each	30502700
Wrench, Single Open-Ended, 1/2-in.		Each	20503022