



Agilent 990 Micro GC and 990 Mobile Micro GC
Chromatograph

Safety Manual



Notices

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Safety Notices

CAUTION

A CAUTION notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met.

WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

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Important Safety Warnings

There are several important safety notices that you should always keep in mind when using the Micro GC.

WARNING

When handling or using chemicals for preparation or use within the Micro GC, all applicable local and national laboratory safety practices must be followed. This includes, but is not limited to, correct use of Personal Protective Equipment (PPE), correct use of storage vials, and correct handling of chemicals, as defined in the laboratory's internal safety analysis and standard operating procedures. Failure to adhere to laboratory safety practices could lead to injury or death.

Lifting

WARNING

The GC is heavy. To avoid injury, use a two-person lift.



CAUTION

Prior to moving, disconnect all electrical and gas connections and completely close all covers and enclosures.

CAUTION

Make sure your GC has adequate distance from the wall and other instruments.

CAUTION

For the Mobile Micro GC, make sure lid is closed.

CAUTION

Prior to moving, toggle the battery switch off. See the Mobile Micro GC User Manual (G3588-90015) for detailed information.

Electrostatic discharge is a threat to GC electronics

The printed circuit (PC) boards in the GC can be damaged by electrostatic discharge. Do not touch any of the boards unless it is absolutely necessary. If you must handle them, wear a grounded wrist strap and take other antistatic precautions. Wear a grounded wrist strap any time you must remove the GC right side cover.

Many parts are dangerously hot

Many parts of the GC operate at temperatures high enough to cause serious burns. These parts include but are not limited to:

- The inlet area
- The injector area
- The column area
- The sample line area
- The detector area
- The column nuts attaching the column to an inlet or detector
- The valve box

You should always cool these areas of the GC to room temperature before working on them. If you must perform maintenance on hot parts, use a wrench and wear thermally protective gloves.

Whenever possible, cool the instrument part that you will be maintaining before you begin working on it.

WARNING

The insulation around the injector, sample line, and column heater is made of refractory ceramic fibers. To avoid inhaling fiber particles, we recommend the following safety procedures: ventilate your work area; wear long sleeves, gloves, safety glasses, and a disposable dust/mist respirator; dispose of insulation in a sealed plastic bag; wash your hands with mild soap and cold water after handling the insulation.

General safety precautions

Follow the following safety practices to ensure safe equipment operation:

- Perform periodic leak checks on all supply lines and pneumatic plumbing.
- Do not allow gas lines to become kinked or punctured. Place lines away from foot traffic and extreme heat or cold.
- Store organic solvents in fireproof, vented and clearly labeled cabinets so they are easily identified as either toxic, or flammable, or both types of materials.
- Do not accumulate waste solvents. Dispose of such materials through a regulated disposal program and not through municipal sewage lines.

WARNING

This instrument is designed for chromatographic analysis of appropriately prepared samples. It must be operated using appropriate gases and within specified maximum ranges for pressure, flows, and temperatures as described in this manual. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

WARNING

It is the responsibility of the customer to inform Agilent customer support representatives if the instrument has been used for the analysis of hazardous samples, prior to any instrument service being performed or when an instrument is being returned for repair.

- Avoid exposure to potentially dangerous voltages. Disconnect the instrument from all power sources before removing protective panels.
- When it is necessary to use a non-original power cord and plug, make sure the replacement cord adheres to the color coding and polarity described in the manual and all local building safety codes.
- Replace faulty or frayed power cords immediately with the same type and rating.
- Place this instrument in a location with sufficient ventilation to remove gases and vapors. Make sure there is enough space around the instrument for it to cool off sufficiently.
- Do not turn on the instrument if there is a possibility of any kind of electrical damage. Instead, disconnect the power cord and contact your local Agilent sales office.
- Before plugging in your instrument, verify that the voltage of your local power source is set appropriately.

Important Safety Warnings

- The supplied power cord must be inserted into a power outlet with a protective ground connection. When using an extension cord, make sure that the cord is also properly grounded.
- Do not change any external or internal grounding connections, as this could endanger you or damage the instrument.
- The instrument is properly grounded when shipped. You do not need to make any changes to the electrical connections or to the instrument chassis to ensure safe operation.
- When working with this instrument, follow the regulations for Good Laboratory Practices (GLP). Take care to wear safety glasses and appropriate clothing.
- Do not place containers with flammable liquids on this instrument. Spilling liquid over hot parts may cause fire.
- This instrument may use flammable or explosive gases, such as hydrogen gas under pressure. Before operating the instrument be sure to be familiar with and to follow accurately the operation procedures prescribed for those gases.
- Never try to repair or replace any component that is not described in this manual without the assistance of an Agilent service engineer. Unauthorized repairs or modifications will result in rejection of warranty claims.
- Always disconnect the AC power cord before attempting any type of maintenance.
- Use proper tools when working on the instrument to prevent danger to you or damage to the instrument.
- Do not attempt to replace any battery or fuse in this instrument other than as specified in the manual.
- Damage can result if the instrument is stored under unfavorable conditions for prolonged periods. (For example, damage will occur if stored while subject to heat, water, or other conditions exceeding the allowable operating conditions).
- This unit has been designed and tested in accordance with recognized safety standards and designed for use indoors.
- If the instrument is used in a manner not specified by the manufacturer, the protection provided by the instrument may be impaired.
- Substituting parts or performing any unauthorized modification to the instrument may result in a safety hazard.
- Changes or modifications not expressly approved by the responsible party for compliance could void the user's authority to operate the equipment.

Hydrogen Safety

Hydrogen is a commonly used GC carrier gas. When mixed with air, hydrogen can form explosive mixtures and has other dangerous characteristics.

WARNING

When using hydrogen (H₂) as the carrier gas, be aware that hydrogen gas can create a fire or explosion hazard. Be sure that the supply is turned off until all connections are made.

Hydrogen is flammable. Leaks, when confined in an enclosed space, may create a fire or explosion hazard. In any application using hydrogen, leak test all connections, lines, and valves before operating the instrument. Always turn off the hydrogen supply at its source before working on the instrument.

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- Hydrogen is combustible over a wide range of concentrations. At atmospheric pressure, hydrogen is combustible at concentrations from 4% to 74.2% by volume.
 - Hydrogen has the highest burning velocity of any gas.
 - Hydrogen has a very low ignition energy.
 - Hydrogen that is allowed to expand rapidly from high pressure into the atmosphere can self-ignite.
 - Hydrogen burns with a nonluminous flame which can be invisible under bright light.
 - If hazardous gases are used, ensure there is proper exhaust ventilation.

Hydrogen shutdown

Hydrogen gas may be used as a carrier or as fuel for some applications. When mixed with air, hydrogen can form explosive mixtures.

The GC monitors inlet, detector, and auxiliary gas streams. If a stream shuts down because it is unable to reach its flow or pressure setpoint and if that stream is configured to use hydrogen, the GC assumes that a leak has occurred and declares a hydrogen safety shutdown. The effects are:

- The offending channel and any associated channels (such as septum purge) are set off.
- The split valves in the inlets open.
- The small heated zones are turned off.
- An alarm tone sounds.

To recover from this state, fix the cause of the shutdown (tank valve closed, serious leak, others). Turn the instrument off, then back on.

WARNING

The GC cannot always detect small leaks in inlet and/or detector gas streams. For this reason, it is vital that column fittings should always be either connected to a column, or have a cap or plug installed. The H₂ streams must be configured for hydrogen so that the GC is aware of hydrogen use.

Measuring hydrogen gas flows

WARNING

Do not measure hydrogen together with air or oxygen. This can create explosive mixtures that can be ignited by the hot surface or high temperature areas.

Power

Many internal parts of the GC carry dangerous voltages

If the GC is connected to a power source, even if the power switch is off, potentially dangerous voltages exist on:

- The wiring between the GC power cord and the AC power supply, the AC power supply itself, and the wiring from the AC power supply to the power switch.

With the power switch on, potentially dangerous voltages also exist on:

- All electronics boards in the instrument.
- The internal wires and cables connected to these boards.

Do not use an Uninterruptable Power Supply (UPS) with a GC

If the area where the GC is located suddenly loses power, an unsafe condition can result if the GC remains powered on. Do not use the GC with a UPS.

WARNING

All these parts are shielded by covers. With the covers in place, it should be difficult to accidentally make contact with dangerous voltages. Unless specifically instructed to, never remove a cover unless the instrument is unplugged.

WARNING

If the power cord insulation is frayed or worn, the cord must be replaced. Contact your Agilent service representative.

WARNING

The appliance inlet coupler (main input power cord) is the power disconnect device. Do not position the instrument such that access to the main power cord is impaired.

WARNING

The front power switch does not disconnect power for the instrument. Pressing the disconnect switch places the instrument in a standby mode. To avoid an electric shock hazard, disconnect the device by unplugging the power cord before performing instrument service.

WARNING

If the enclosure of the external power supply is damaged or cracked, it must be replaced. Contact your Agilent service representative.

WARNING

For the Mobile Micro GC, do not attempt to replace the rechargeable batteries.

WARNING


Read the Mobile Micro GC User Manual (G3588-90015) before charging or discharging.

Safety and Regulatory Certifications

The Agilent GC conforms to the following safety standards:

- Canadian Standards Association (CSA): C22.2 No. 61010-1
- CSA/Nationally Recognized Test Laboratory (NRTL): ANSI/UL 61010-1
- International Electrotechnical Commission (IEC): 61010-1, 61010-2-010, 61010-2-081
- EuroNorm (EN): 61010-1

The Agilent Micro GC conforms to the following regulations on Electromagnetic Compatibility (EMC) and Radio Frequency Interference (RFI):

- CISPR 11/EN 55011: Group 1, Class A
- IEC/EN 61326
-  AUS/NZ

This ISM device complies with Canadian ICES-001. Cet appareil ISM est conforme a la norme NMB-001 du Canada.



The Agilent GC is designed and manufactured under a quality system registered to ISO 9001. Declaration of Conformity available.

Regulatory compliance identification numbers

For the purpose of regulatory compliance certifications and identification, your product has been assigned a unique Agilent Regulatory Model Number (RMN). The 990 Micro GC RMN3588A, and 990 Mobile GC RMN3588-F can be found on the product nameplate label, along with all required approval markings and information. When requesting compliance information for this product, always refer to this RMN. The RMN should not be confused with the marketing name or model number of the product.



Instructions for Disposal of Waste Equipment by Users in the European Union. This symbol on the product or its packaging indicates that this product must not be disposed of with other waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city recycling office or the dealer from whom you originally purchased the product.

EMC declaration for South Korea

사용자안내문

이 기기는 업무용 환경에서 사용할 목적으로 적합성평가를 받은 기기로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다.

This equipment has been evaluated for its suitability for use in a commercial environment. When used in a domestic environment, there is a risk of radio interference.

Detachable Power Cord Declaration for Japan

(弊社提供の電源コードセットが汎用性がない旨を示す)

電源コードセットの取扱いについて (日本国内向け)

製品には、同梱された電源コードセットをお使いください。同梱された電源コードセットは、他の製品では使用できません。

WARNING

Your product must only use the power cord and power supply adapter that was shipped with this product. Do not use this power cord with any other product.

Classifications

The Agilent Gas Chromatograph meets the following IEC (International Electro-technical Commission) classifications: Safety Class 1, Transient Overvoltage Category II, Pollution Degree 2.

This unit has been designed and tested in accordance with recognized safety standards and is designed for use indoors in non-classified locations. If the instrument is used in a manner not specified by the manufacturer, the protection provided by the instrument may be impaired. Whenever the safety protection of the Agilent Gas Chromatograph has been compromised, disconnect the unit from all power sources and secure the unit against unintended operation.

Refer servicing to qualified service personnel. Substituting parts or performing any unauthorized modification to the instrument may result in a safety hazard.

Safety Symbols

See accompanying instructions for more information.



Indicates a hot surface.



Indicates hazardous voltages.



Indicates earth (ground) terminal.



Indicates electrostatic discharge hazard.



Indicates a hazard. See the Agilent 990 GC user documentation for the item labeled.



Indicates that you must not discard this electrical/electronic product in domestic household waste



To avoid injury, use a two-person lift



Warnings in the manual or on the instrument must be observed during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions violates safety standards of design and the intended use of the instrument. Agilent Technologies assumes no liability for the customer's failure to comply with these requirements.

Electromagnetic compatibility

EN55011/CISPR11

Group 1 ISM equipment: Group 1 contains all ISM equipment in which there is intentionally generated and/or used conductively coupled radio- frequency energy which is necessary for the internal functioning of the equipment itself.

Class A equipment: Equipment suitable for use in all establishments other than domestic and those directly connected to a low voltage power supply network which supplies buildings used for domestic purposes.

This device complies with the requirements of CISPR11, Group 1, Class A as radiation professional equipment. Therefore, there may be potential difficulties in ensuring electromagnetic compatibility in other environments, due to conducted as well as radiated disturbances.

This device complies with the requirements of CISPR 11. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try one or more of the following measures:

- 1 Relocate the radio or antenna.
- 2 Move the device away from the radio or television.
- 3 Plug the device into a different electrical outlet, so that the device and the radio or television are on separate electrical circuits.
- 4 Make sure that all peripheral devices are also certified.
- 5 Make sure that appropriate cables are used to connect the device to peripheral equipment.
- 6 Consult your equipment dealer, Agilent Technologies, or an experienced technician for assistance.
- 7 Changes or modifications not expressly approved by Agilent Technologies could void the user's authority to operate the equipment.

Sound emission certification for Federal Republic of Germany

Sound pressure

Sound pressure $L_p < 70$ dB(A) according to DIN-EN 27779.

Schalldruckpegel

Schalldruckpegel $LP < 70$ dB(A) nach DIN-EN 27779.

Intended Use

Agilent products must only be used in the manner described in the Agilent product user guides. Any other use may result in damage to the product or personal injury. Agilent is not responsible for any damages caused, in whole or in part, by improper use of the products, unauthorized alterations, adjustments or modifications to the products, failure to comply with procedures in Agilent product user guides, or use of the products in violation of applicable laws, rules or regulations.

Cleaning

To clean the unit, disconnect the power and wipe down with a damp, lint-free cloth.

Recycling the Product



For recycling, contact your local Agilent sales office.

Electromagnetic compatibility

www.agilent.com

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