

ACCQPrep® SFC

Important Information

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Overview

This document contains information for the ACCQPrep SFC system. Additional information can be found in the *ACCQPrep SFC Installation and Operation Guide*, available as a PDF file that can be downloaded from www.teledyneisco.com.

General Definitions and Symbols

⚠ CAUTION

Cautions identify a potential hazard, which if not avoided, may result in minor or moderate injury. This category can also warn you of unsafe practices, or conditions that may cause property damage.

⚠ DANGER

DANGER – limited to the most extreme situations to identify an imminent hazard, which if not avoided, will result in death or serious injury.

⚠ WARNING

Warnings identify a potentially hazardous condition, which if not avoided, could result in death or serious injury.

Hazard Symbols Used on Instrument

Warnings and Cautions		Warnungen und Vorsichtshinweise	
	The exclamation point within the triangle is a warning sign alerting you of important instructions in the instrument's technical reference manual.		Das Ausrufezeichen in Dreieck ist ein Warnzeichen, das Sie darauf aufmerksam macht, daß wichtige Anleitungen zu diesem Handbuch gehören.
	The lightning flash and arrowhead within the triangle is a warning sign alerting you of "dangerous voltage" inside the product.		Der gepfeilte Blitz im Dreieck ist ein Warnzeichen, das Sei vor "gefährlichen Spannungen" im Inneren des Produkts warnt.
	The three wavy lines above the horizontal line within the triangle is a warning sign alerting you of a "hot surface" inside the product.		Der drei Wellenlinien über der horizontalen Linie Dreieck ist ein Warnzeichen, das Sei vor "heißen Oberfläche" im Inneren des Produkts warnt.
Symboles de sécurité		Advertencias y Precauciones	
	Ce symbole signale l'existence d'instructions importantes relatives au produit dans ce manuel.		Esta señal le advierte sobre la importancia de las instrucciones del manual que acompañan a este producto.
	Ce symbole signale la présence d'un danger d'électrocution.		Esta señal alerta sobre la presencia de alto voltaje en el interior del producto.
	Ce symbole signale la présence d'une surface chaude à l'intérieur du produit.		Esta señal alerta sobre la presencia de superficie caliente en el interior del producto.

ACCQPrep SFC Safety Considerations

Before installing, operating, or maintaining this equipment, all hazards and preventive measures must be fully understood. While specific hazards may vary according to location and application, read and follow these general warnings:

General Safety Guidance

Follow all applicable safety practices and regulations when handling and moving the system's shipping crate and associated containers, and when moving the system itself.

CAUTION

Lifting or Moving the Equipment

When carrying or moving the instrument, use the supplied system handles and remove when complete. Holding by the sides or bottom of the instrument may result in pinched fingers causing injury or damage the instrument.

When carrying, use the free hand to stabilize the instrument.

Do not carry multiple modules at the same time.

CAUTION

Installation

installation should be performed by Teledyne ISCO qualified personnel

WARNING

Safe Lifting Practice

Keep the unit upright when moving. Be sure to follow your company's procedures and practices regarding the safe lifting and relocation of heavy objects. Use a 2-person lift when moving or carrying the modules.

Locate the system away from potential spark sources. See the warning below regarding placing the system.

Keep the system's power cord plug and outlet easily accessible in case the system needs to be disconnected quickly from AC power.

Install external fire protection conforming to local regulations

Have plans in place that conform to local regulations to address solvent spills or leakage at your site to prevent a fire or explosion hazard.

CAUTION

When opening the oven drawer, be careful to not pinch your fingers.

Chemical, Laboratory, and Equipment Hazards

WARNING

Use of Flammable and/or Hazardous Chemicals and Solvents

Chemicals used with this instrument may be classified as carcinogenic, bio-hazardous, flammable, or radioactive. Additionally, the use of flammable solvents or chemicals with this system may result in vapor concentration levels that exceed the maximum exposure levels as recommended by OSHA Guide 1910.1000.

Do not use solvents with an autoignition temperature below 200 °C.

In all cases, use good laboratory practices and standard safety procedures.

Should these chemicals be used, Teledyne ISCO highly recommends that these applications be performed in an isolated environment and/or a laboratory fume hood designed to reduce exposure to a safe level for these types of materials in accordance with federal, state, and local regulatory laws, and in compliance with your company's chemical/hygiene plan in the event of a spill.

WARNING

Damage to System by Chemicals

Do not allow chemicals to come into contact with the system's power cord or cables. Solvents can degrade cord and cable insulation, causing a risk of electric shock, fire, and equipment damage.

CAUTION

Flowpath under Pressure

Before removing any component in the high-pressure flowline, such as tubing, the sample loop, in-line filter, column, etc. stop the pump and confirm the system pressure has fallen to zero. Depending on the position in the flow path the system may need to be vented via Manual Control to release the pressure completely. Removing any of these parts while high pressure remains could cause the mobile phase and the clogging particles to eject rapidly and injury could occur.

Chemical, Laboratory, and Equipment Hazards (continued)

CAUTION

Unintended Use of this Equipment

Use of this instrument in any way not specified in the manual, may impair the protection provided by the instrument.

Operators and maintainers of the system must be provided with all applicable health and safety regulations for use of the system, its accessories, and consumables. They must be educated, trained, and competent to use the machine as it is intended.

Hazards Unique to SFC: Using Carbon Dioxide

The ACCQPrep SFC system is designed to perform supercritical fluid chromatography using carbon dioxide (CO₂) as the supercritical fluid. The use of other supercritical fluids is prohibited.

Your CO₂ gas supplier should be consulted for proper design, installation, and safety guidance regarding CO₂ supply infrastructure.

The use of supercritical fluids brings risks that are beyond that typical of traditional HPLC or flash chromatography techniques. Carbon dioxide as a gas is colorless, odorless, and tasteless. While CO₂ offers several advantages in safety being non-toxic and non-flammable, it does present the risk of asphyxiation.

Typical concentrations of CO₂ in a room can vary between 350 and 1,000 ppm. As levels rise above 2,000–5,000 ppm, they can create health problems like headache, sweating, rapid breathing, increased heart rate, shortness of breath, dizziness, visual disturbances, or shaking. Higher concentrations (above 100,000 ppm) can result in unconsciousness or death.

The pressure of a CO₂ cylinder is about 860 psi at room temperature. A typical CO₂ cylinder stores approximately 50 lbs. of liquid CO₂. One kg of liquid CO₂ expands to around 535 L of CO₂ gas at atmospheric pressure. In the case of a cylinder or tank rupturing or releasing into an enclosed space, the room can quickly fill with CO₂ and either poison an individual or displace all the oxygen available for breathing.

DANGER

Risk of frostbite

If carbon dioxide leaks from the system tubing or fitting, dry ice may form, which may cause frostbite if touched. Should leakage occur, stop the pumps and take appropriate action after the dry ice dissipates.

DANGER

Hot Surface

The column oven is able to reach temperatures up to 70 °C. Areas near the heating plate may be hotter.

Open the top door of the oven drawer carefully to allow hot air to vent. Columns can be hot to the touch and should be changed once cool.

WARNING

Pressurized Gas

The ACCQPrep SFC system must be installed in a well-ventilated room.

CO₂ is denser than air and can accumulate in higher concentrations in low spaces.

CO₂ monitors should be installed in rooms where the ACCQPrep SFC system is installed and any other areas that house CO₂ supply cylinders or tanks with an alert function in case the measured CO₂ level exceeds 5,000 ppm.

The system is pressurized, even after power shut-off. Venting of pressurized gases and solvent is possible.

Keep CO₂ systems gas-tight. Seal any leaks immediately.

WARNING

Aerosolization

Depressurization of CO₂ from the eluate during fraction collection may result in aerosolization of compounds/sample or solvent found in the eluate. Do not inhale aerosolized particles and observe safety data sheets for all substances being used.

The ACCQPrep SFC system should be properly exhausted to suitable exhaust source and the AutoSampler or fraction collection bottles should be used in an appropriately exhausted fume cabinet, enclosure hood.

Note

The ACCQPrep SFC has an automatic solenoid shut-off valve for the CO₂ inlet supply with a redundant closed state when not powered. Shutting off the system or removing power to it will result in the valve shutting off in an emergency. This valve may malfunction if blocked with particle from a contaminated CO₂ source. It is advised to have a back-up shut-off valve near the instrument.

Electrical Hazards: Electrostatic Discharge

Maintaining the System to Prevent Static Electrostatic Discharge

Clean the collection tube racks and tray monthly. They are made of conductive plastic which must be kept clean to dissipate static electricity. Use distilled water with a mild detergent. For tougher stains, use isopropyl alcohol.

Preventing Person-to-System Electrostatic Discharge

Observe the following precautions to prevent person-to-system electrical static discharges:

- 1) Wear anti-static clothing and shoes when operating the system. Stand on an anti-static floor mat.
- 2) Touch a grounded object before touching the system or before handling any of its parts (such as columns). For example, metal water pipes are typically grounded. This will discharge any static electricity you may have accumulated.
- 3) Maintain humidity above 65% at the instrument location so that static buildup will be generated less readily.

Preventing Static Electrostatic Discharge During System Operation

Static electricity can also be generated during system operation, such as when non-polar liquids flow through it. To prevent static buildup as the system operates, observe the following precautions:

- 1) Do not exceed the flow rate specified in the documentation for the preparative chromatography column.
- 2) Prevent air bubbles from accumulating in the flow lines. These can significantly increase electrostatic charge.

Electrical Hazards: General

WARNING

Placing the System

Do not locate this instrument near potential spark sources such as equipment with mechanical thermostats or line level power switches. Vapors that occur during normal operation due to open fraction collection vials may be ignited by external spark sources.

CAUTION

Static Electricity

Do not modify any of the tubing/fittings used on or within the system. System tubing/fittings is designed to meet specific pressure requirements.

When using the ACCQPrep SFC preparative chromatography system, take precautions to avoid static electricity buildup. Discharges of static electricity could ignite vapors, especially when using the system with flammable, non-conducting solvents operating under high flow rate conditions.

Read, understand, and follow all local and national codes and regulations to avoid static electricity hazards.

WARNING

Substitution of Tubing

Never substitute the black tubing on ACCQPrep SFC systems. The black tubing (P/N 023-0503-06) is anti-static. This tubing is required to dissipate static electricity. Discharges of static electricity could ignite vapors.

WARNING

Solvent Leaks and Spills

Do not wipe solvents from system or column surfaces while the system is operating or while it is plugged in.

In the event of such solvent leaks, immediately turn off the system and disconnect the power cord. The combination power switch and circuit breaker is located on the rear panel.

In event of column leakage, allow all solvent vapor to dissipate before removing the column. Failure to do so could cause a discharge of static electricity that could ignite vapors.

Have plans in place that conform to local regulations to address solvent spills or leakage at your site.

WARNING

Resetting of GFI Devices and Circuit Breakers

If the lab power outlet circuit breaker or GFI (Ground Fault Interrupter) is tripped, follow your company's procedures to ensure no hazardous conditions occur, such as an electrical spark igniting solvent vapors in the area.

If the rear panel circuit breaker is tripped, the area should be cleared of solvents and vapors before resetting the circuit breaker. If the breaker trips again, follow your company's guidance on lock out/tag out to prevent operation until the instrument can be repaired by a qualified service technician.

ACCQPrep SFC General Information

Pressure Limits

The ACCQPrep SFC system has redundant safety devices to limit system pressure, the maximum system pressure is the lowest value as based on the following consideration:

- 1) 6,000 psi (412 bar) maximum system pressure; or
- 2) the maximum pressure of the column as defined by the user in the Prep SFC Configuration.

Turning the System On and Off

ACCQPrep SFC systems use a combination power switch and circuit breaker located on the rear panel of the control module and rear panel of the oven module. For normal operation, the switch can be left on while the right side panel Run/Standby push button is used to control most power circuits within the instrument. Power consumption while in Standby is ~6W. Use of the rear panel power switch basis is also acceptable. If used for power control, the system should be placed in Standby until the screen goes dark before switching the back panel power switch off to allow the internal operating system to complete an orderly shutdown.

CAUTION

Do NOT turn ON the main power of the AutoSampler while the ACCQPrep SFC is turned ON.

Ensure that the AutoSampler is turned on before the ACCQPrep SFC unit in order to avoid damage to the system.

Note

The rear panel mounted circuit breaker is the power disconnect device.

FCC Statement

ACCQPrep SFC systems with AutoSamplers are equipped with RFID rack recognition, contain modules with FCC ID number 2ADZBID-2, and are subject to the following statements:

- 1) This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
 - a) This device may not cause harmful interference.
 - b) This device must accept any interference received, including interference that may cause undesired operation.
- 2) Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Technical Assistance

Assistance for Teledyne ISCO ACCQPrep SFC systems can be obtained from:

Teledyne ISCO

4700 Superior St.
Lincoln NE 68504

Phone: (800) 775-2965 or (402) 853-5340

Fax: (402) 465-3001

Email: Isco.Service@teledyne.com

Teledyne ISCO

P.O. Box 82531, Lincoln, Nebraska, 68501 USA
Toll-free: (800) 228-4373 • Phone: (402) 464-0231 • Fax: (402) 465-3022
Email: Isco.Service@teledyne.com

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