Waters
THE SCIENCE OF WHAT'S POSSIBLE.™

Alliance iS Column Heater Cooler (CHC)

User Guide

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Version 00

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1 General information

1.1 Copyright notice

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1.2 Trademarks

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THE SCIENCE OF WHAT'S POSSIBLE™ is a trademark of Waters Corporation.

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All other trademarks are property of their respective owners.

1.3 Safety considerations

Some reagents and samples used with Waters instruments and devices can pose chemical, biological, or radiological hazards (or any combination thereof). You must know the potentially hazardous effects of all substances you work with. Always follow good laboratory practices and consult your organization’s standard operating procedures as well as your local requirements for safety.

1.3.1 Safety hazard symbol notice

The  symbol indicates a potential hazard. Consult the documentation for important information about the hazard and the appropriate measures to prevent and control the hazard.

1.3.2 Electrical power safety notice

Do not position the device so that it is difficult to disconnect the power cord.

1.3.3 Equipment misuse notice

If equipment is used in a manner not specified by its manufacturer, the protection provided by the equipment may be impaired.

1.3.4 Safety advisories

Consult the "Safety advisories" appendix in this publication for a comprehensive list of warning advisories and notices.

1.4 EMC considerations

1.4.1 Near field communications (NFC)/RFID aspects

The Alliance iS Column Heater Cooler (CHC) is used with the Alliance iS HPLC System. The CHC can be equipped with NFC/RFID technology. The national approvals associated with this RF feature are associated only with the CHC and not with other sections of the system or the system in its entirety. The 13.56-MHz NFC/RFID reader is located on the door of the CHC. It performs a read cycle when the door is closed. The duration of the read cycle is less than one second. It is inactive until the next door open/door close event. The power is less than 2 W.

1.4.2 FCC radiation emissions notice

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. 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.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference with radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user is required to correct the interference at their own expense.

1.4.2.1 FCC RF exposure warning

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. To avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna must be at least 10 cm during normal operation, and the antenna must not be co-located or operating in conjunction with any other antenna or transmitter.

1.4.3 Canada spectrum management emissions notice

This class A digital product apparatus complies with CAN ICES-001 (A).

Cet appareil numérique de la classe A est conforme à la norme NMB-001 (A).

This device contains a license-exempt transmitter that complies with Innovation, Science, and Economic Development Canada’s license-exempt RSSs. Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

1.4.3.1 ISED RF exposure information

The equipment complies with the ISED RSS-102 radiation exposure limits set forth for an uncontrolled environment. This transmitter must be installed to provide a separation distance of at least 10 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

Cet équipement est conforme avec ISED RSS-102 des limites d'exposition aux rayonnements définies pour un environment non contrôlé. Cet émetteur doit être installé à au moins 10 cm de toute personne at ne doit pas être colocalisé ou fonctionner en association avec une autre antenne ou émetteur.

IC: 29985-CHC-PHC-001

1.4.4 ISM classification: ISM group 1 class A

This classification was assigned in accordance with CISPR 11 Industrial Scientific and Medical (ISM) instruments requirements.

Group 1 products apply to intentionally generated and/or used conductively coupled radio-frequency energy that is necessary for the internal functioning of the equipment.

Class A products are suitable for use in all establishments other than residential locations and those directly connected to a low-voltage power supply network supplying a building for domestic purposes.

There may be potential difficulties in ensuring electromagnetic compatibility in other environments due to conducted and radiated disturbances.

This equipment complies with the emission and immunity requirements described in the relevant parts of IEC/EN 61326: Electrical equipment for measurement, control, and laboratory use — EMC requirements.

1.4.5 Other country-specific EMC considerations

The following country-specific considerations apply to the use of the Alliance iS Column Heater Cooler (CHC).

Brazil	Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados. Para maiores informações, consulte o site da ANATEL – www.anatel.gov.br
Korea	
Taiwan	取得審驗證明之低功率射頻器材，非經核准，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。低功率射頻器材之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前述合法通信，指依電信管理法規定作業之無線電通信。低功率射頻器材須忍受合法通信或工業、 科學及醫療用電波輻射性電機設備之干擾。

Thailand	 เครื่องโทรคมนาคมและอุปกรณ์นี้มีความสอดคล้องตามมาตรฐานหรือข้อกำหนดทางเทคนิคของ กสทช.

1.5 Operating the device

When operating the device, follow the guidelines presented in this section.

1.5.1 Intended use of the Alliance iS CHC

The Alliance iS Column Heater Cooler (CHC) is an AC-powered device that houses the fluidics column used to perform HPLC (High Pressure Liquid Chromatography) separations for the Alliance iS system. The CHC assembly can provide temperature to the column from 4 °C to 90 °C. If the LC column is equipped with a passive NFC tag (13.56 MHz), it is read when the front door of the CHC is closed. The antenna circuitry is normally not active until the door closure service event. Data from the tag is stored in the system.

1.5.2 Audience and purpose

This guide is intended for use only by professionally trained and qualified laboratory personnel who operate and maintain Waters products.

1.5.3 Applicable symbols

The following symbols can be present on the device, system, or packaging.

Symbol	Definition
	Manufacturer
	Date of manufacture
	Confirms that a manufactured product complies with all applicable European Community directives
	UK Conformity Assessed marking confirms that a manufactured product is in conformity with the applicable requirements for products sold within Great Britain
	Australia EMC compliant
	Confirms that a manufactured product complies with all applicable United States and Canadian safety requirements
	Confirms that a manufactured product complies with all applicable United States and Canadian safety requirements
	Environmentally friendly use period (China RoHS): indicates the number of years from the date of manufacture until the product, or components within the product, are likely to be discarded or degrade into the environment
	Consult instructions for use
	Alternating current
	Electrical and electronic equipment with this symbol may contain hazardous substances and should not be disposed of as general waste For compliance with Waste Electrical and Electronic Equipment legislation, contact Waters Corporation for the correct disposal and recycling instructions
	For indoor use only

Symbol	Definition
	No pushing
	Do not connect to an LC system
	Indicates the maximum load you can place on that item (for example, 10kg)
	Serial number
	Part number, catalog number

1.6 Additional resources

Waters provides the following additional resources to ensure your continued success with our products.

Knowledge base: Obtain quick answers to your troubleshooting questions. Access support articles on Waters instrumentation, informatics, and chemistry.

eLearning courses: Learn anytime, anywhere, and at your own pace with eLearning courses.

Customer education: Waters Educational services team is the leading training organization empowering scientists to maximize their skills in UPLC, HPLC, LC-MS, and data management.

Application notes: View our online digital library of Application notes for advanced analytical technologies including chromatography, mass spectrometry, columns and sample preparation, and data management software, demonstrating impactful scientific and operational benefits.

How-to video library: View/download the latest product how-to videos.

Graphical parts locator: Identify and order parts using an interactive graphical navigator. Access maintenance procedures and reference documents.

Product selection tools and resources: A collection of wizards that help you pick the correct chemistry consumables to meet your separation requirements, including vials, plates, filters, column selectivity charts, and more.

1.7 Contacting Waters

Contact Waters with technical questions regarding the use, transportation, removal, or disposal of any Waters product. You can reach us through the Internet, telephone, fax, or conventional mail.

Contact method	Information
www.waters.com	The Waters website includes contact information for Waters locations worldwide.
iRequest	iRequest is a secure Web service form that allows you to request support and service for Waters instruments and software or to schedule a planned service activity. These types of support and services may be included as part of your maintenance plan or support plan. You may be charged for the requested

Contact method	Information
	service if you do not have appropriate plan coverage for your product. **Note:** In areas managed by authorized distributors, iRequest may not be available. Contact your local distributor for more information.
Local office contact information	For worldwide locations, telephone, fax, and conventional mail information is available at the Local Offices website.
Corporate contact information	Waters Corporation Global Support Services 34 Maple Street Milford, MA 01757 USA From the USA or Canada, phone 800-252-4752 or fax 508-872-1990.

1.8 Customer comments

We seriously consider every customer comment we receive. Help us better understand what you expect from our documentation so that we can continuously improve its accuracy and usability. To report any errors that you encounter in this document or to suggest ideas for otherwise improving it, reach us at tech_comm@waters.com.

2 Safety advisories

Consult the "Safety advisories" appendix in this publication for a comprehensive list of warning advisories and notices.

2.1 Warning symbols

Warning symbols alert you to the risk of death, injury, or seriously adverse physiological reactions associated with the misuse of an instrument or device. Heed all warnings when you install, repair, or operate any Waters instrument or device. Waters accepts no liability in cases of injury or property damage resulting from the failure of individuals to comply with any safety precaution when installing, repairing, or operating any of its instruments or devices.

The following symbols warn of risks that can arise when you operate or maintain a Waters instrument or device or component of an instrument or device. When one of these symbols appears in a manual's narrative sections or procedures, an accompanying statement identifies the applicable risk and explains how to avoid it.

Warning: (General risk of danger. When this symbol appears on an instrument, consult the instrument's user documentation for important safety-related information before you use the instrument.)

Warning: (Risk of burn injury from contacting hot surfaces.)

Warning: (Risk of electric shock.)

Warning: (Risk of fire.)

Warning: (Risk of sharp-point puncture injury.)

Warning: (Risk of hand crush injury.)

Warning: (Risk of injury caused by moving machinery.)

Warning: (Risk of exposure to ultraviolet radiation.)

Warning: (Risk of contacting corrosive substances.)

Warning: (Risk of exposure to a toxic substance.)

Warning: (Risk of personal exposure to laser radiation.)

Warning: (Risk of exposure to biological agents that can pose a serious health threat.)

Warning: (Risk of tipping.)

Warning: (Risk of explosion.)

Warning: (Risk of high-pressure gas release.)

2.2 Notices

Notice advisories appear where an instrument, device, or component can be subject to use or misuse that can damage it or compromise a sample's integrity. The exclamation point symbol and its associated statement alert you to such risk.

Notice: To avoid damaging the case of the instrument or device, do not clean it with abrasives or solvents.

2.3 Required protection

The Use Eye Protection and Wear Protective Gloves symbols alert you to the requirement for personal protective equipment. Select appropriate protective equipment according to your organization's standard operating procedures.

Requirement: Use eye protection when performing this procedure.

Requirement: Wear clean, chemical-resistant, powder-free gloves when performing this procedure.

2.4 Warnings that apply to all Waters instruments and devices

When operating this device, follow standard quality-control procedures and the equipment guidelines in this section.

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Avertissement : Toute modification sur cette unité n'ayant pas été expressément approuvée par l'autorité responsable de la conformité à la réglementation peut annuler le droit de l'utilisateur à exploiter l'équipement.

Warnung: Jedwede Änderungen oder Modifikationen an dem Gerät ohne die ausdrückliche Genehmigung der für die ordnungsgemäße Funktionstüchtigkeit verantwortlichen Personen kann zum Entzug der Bedienungsbefugnis des Systems führen.

Avvertenza: Qualsiasi modifica o alterazione apportata a questa unità e non espressamente autorizzata dai responsabili per la conformità fa decadere il diritto all'utilizzo dell'apparecchiatura da parte dell'utente.

Advertencia: Cualquier cambio o modificación efectuado en esta unidad que no haya sido expresamente aprobado por la parte responsable del cumplimiento puede anular la autorización del usuario para utilizar el equipo.

警告： 未经有关法规认证部门明确允许对本设备进行的改变或改装，可能会使使用者丧失操作该设备的合法性。

警告： 未經有關法規認證部門允許對本設備進行的改變或修改,可能會使使用者喪失操作該設備的權利。

경고: 규정 준수를 책임지는 당사자의 명백한 승인 없이 이 장치를 개조 또는 변경할 경우, 이 장치를 운용할 수 있는 사용자 권한의 효력을 상실할 수 있습니다.

警告: 規制機関から明確な承認を受けずに本装置の変更や改造を行うと、本装置のユーザーとしての承認が無効になる可能性があります。

Warning: Use caution when working with any polymer tubing under pressure:

- Always wear eye protection when near pressurized polymer tubing.
- Extinguish all nearby flames.
- Do not use tubing that has been severely stressed or kinked.
- Do not use nonmetallic tubing with tetrahydrofuran (THF) or concentrated nitric or sulfuric acids.
- Be aware that methylene chloride and dimethyl sulfoxide cause nonmetallic tubing to swell, which greatly reduces the rupture pressure of the tubing.

Avertissement : Manipulez les tubes en polymère sous pression avec précaution:

- Portez systématiquement des lunettes de protection à proximité de tubes en polymère sous pression.
- Éteignez toute flamme se trouvant à proximité de l’instrument.
- Évitez d'utiliser des tubes sévèrement déformés ou endommagés.
- N’exposez pas les tuyaux non métalliques au tétrahydrofurane, ou THF, ou à de l’acide nitrique ou sulfurique concentré.
- Sachez que le chlorure de méthylène et le diméthylesulfoxyde entraînent le gonflement des tuyaux non métalliques, ce qui réduit considérablement leur pression de rupture.

Warnung: Bei der Arbeit mit Polymerschläuchen unter Druck ist besondere Vorsicht angebracht:

- In der Nähe von unter Druck stehenden Polymerschläuchen stets eine Schutzbrille tragen.
- Alle offenen Flammen in der Nähe löschen.
- Keine Schläuche verwenden, die stark geknickt oder überbeansprucht sind.
- Nichtmetallische Schläuche nicht für Tetrahydrofuran (THF) oder konzentrierte Salpeter- oder Schwefelsäure verwenden.
- Durch Methylenchlorid und Dimethylsulfoxid können nichtmetallische Schläuche quellen; dadurch wird der Berstdruck des Schlauches erheblich reduziert.

Avvertenza: Fare attenzione quando si utilizzano tubi in materiale polimerico sotto pressione:

- Indossare sempre occhiali da lavoro protettivi nei pressi di tubi di polimero pressurizzati.
- Spegnere tutte le fiamme vive nell'ambiente circostante.
- Non utilizzare tubi eccessivamente logorati o piegati.
- Non utilizzare tubi non metallici con tetraidrofurano (THF) o acido solforico o nitrico concentrati.
- Tenere presente che il cloruro di metilene e il dimetilsolfossido provocano rigonfiamento nei tubi non metallici, riducendo notevolmente la resistenza alla rottura dei tubi stessi.

Advertencia: Se recomienda precaución cuando se trabaje con tubos de polímero sometidos a presión:

- El usuario deberá protegerse siempre los ojos cuando trabaje cerca de tubos de polímero sometidos a presión.
- Apagar cualquier llama que pueda estar encendida en las proximidades.
- No se debe trabajar con tubos que se hayan doblado o sometido a altas presiones.
- Es necesario utilizar tubos de metal cuando se trabaje con tetrahidrofurano (THF) o ácidos nítrico o sulfúrico concentrados.
- Hay que tener en cuenta que el diclorometano y el dimetilsulfóxido dilatan los tubos no metálicos, lo que reduce la presión de ruptura de los tubos.

警告： 当有压力的情况下使用聚合物管线时，小心注意以下几点：

- 当接近有压力的聚合物管线时一定要戴防护眼镜。
- 熄灭附近所有的火焰。
- 不要使用已经被压瘪或严重弯曲的管线。
- 不要在非金属管线中使用四氢呋喃或浓硝酸或浓硫酸。
- 要了解使用二氯甲烷及二甲基亚砜会导致非金属管线膨胀，大大降低管线的耐压能力。

警告： 當在有壓力的情況下使用聚合物管線時，小心注意以下幾點。

- 當接近有壓力的聚合物管線時一定要戴防護眼鏡。
- 熄滅附近所有的火焰。
- 不要使用已經被壓癟或嚴重彎曲管線。
- 不要在非金屬管線中使用四氫呋喃或濃硝酸或濃硫酸。
- 要了解使用二氯甲烷及二甲基亞碸會導致非金屬管線膨脹，大大降低管線的耐壓能力。

경고: 가압 폴리머 튜브로 작업할 경우에는 주의하십시오.

- 가압 폴리머 튜브 근처에서는 항상 보호 안경을 착용하십시오.
- 근처의 화기를 모두 끄십시오.
- 심하게 변형되거나 꼬인 튜브는 사용하지 마십시오.
- 비금속(Nonmetallic) 튜브를 테트라히드로푸란(Tetrahydrofuran: THF) 또는 농축 질산 또는 황산과 함께 사용하지 마십시오.
- 염화 메틸렌(Methylene chloride) 및 디메틸술폭시드(Dimethyl sulfoxide)는 비금속 튜브를 부풀려 튜브의 파열 압력을 크게 감소시킬 수 있으므로 유의하십시오.

警告: 圧力のかかったポリマーチューブを扱うときは、注意してください。

- 加圧されたポリマーチューブの付近では、必ず保護メガネを着用してください。
- 近くにある火を消してください。
- 著しく変形した、または折れ曲がったチューブは使用しないでください。
- 非金属チューブには、テトラヒドロフラン (THF) や高濃度の硝酸または硫酸などを流さないでください。
- 塩化メチレンやジメチルスルホキシドは、非金属チューブの膨張を引き起こす場合があり、その場合、チューブは極めて低い圧力で破裂します。

This warning applies to Waters instruments fitted with nonmetallic tubing or operated with flammable solvents.

Warning: The user shall be made aware that if the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Avertissement : L'utilisateur doit être informé que si le matériel est utilisé d'une façon non spécifiée par le fabricant, la protection assurée par le matériel risque d'être défectueuse.

Warnung: Der Benutzer wird darauf aufmerksam gemacht, dass bei unsachgemäßer Verwendung des Gerätes die eingebauten Sicherheitseinrichtungen unter Umständen nicht ordnungsgemäß funktionieren.

Avvertenza: Si rende noto all'utente che l'eventuale utilizzo dell'apparecchiatura secondo modalità non previste dal produttore può compromettere la protezione offerta dall'apparecchiatura.

Advertencia: El usuario debe saber que, si el equipo se utiliza de forma distinta a la especificada por el fabricante, las medidas de protección del equipo podrían ser insuficientes.

警告： 使用者必须非常清楚如果设备不是按照制造厂商指定的方式使用，那么该设备所提供的保护将被削弱。

警告： 使用者必須非常清楚如果設備不是按照製造廠商指定的方式使用，那麼該設備所提供的保護將被消弱。

경고: 제조업체가 명시하지 않은 방식으로 장비를 사용할 경우 장비가 제공하는 보호 수단이 제대로 작동하지 않을 수 있다는 점을 사용자에게 반드시 인식시켜야 합니다.

警告: ユーザーは、製造元により指定されていない方法で機器を使用すると、機器が提供している保証が無効になる可能性があることに注意して下さい。

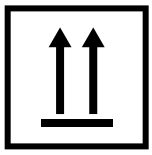
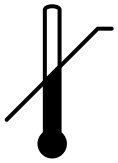
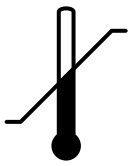
2.5 Electrical symbols

The following electrical symbols and their associated statements can appear in instrument manuals and on an instrument's front or rear panels.

Symbol	Description
	Electrical power on
	Electrical power off
	Standby
	Direct current
	Alternating current
	Alternating current (three phase)
	Safety ground
	Frame or chassis terminal connection
	Fuse
	Functional ground
	Input
	Output
	Indicates that the device or assembly is susceptible to damage from electrostatic discharge (ESD)

2.6 Handling symbols

The following handling symbols and their associated statements can appear on labels affixed to the packaging in which instruments, devices, and component parts are shipped.

Symbol	Description
	Keep upright!
	Keep dry!
	Fragile!
	Use no hooks!
	Upper limit of temperature
	Lower limit of temperature
	Temperature limitation

3 Alliance iS Column Heater Cooler (CHC) overview

The Waters Alliance iS Column Heater Cooler (CHC) supports the Alliance iS HPLC system functions for LC separations. Refer to the system guides for all system-level functions.

Figure 3–1: Alliance iS Column Heater Cooler (CHC)

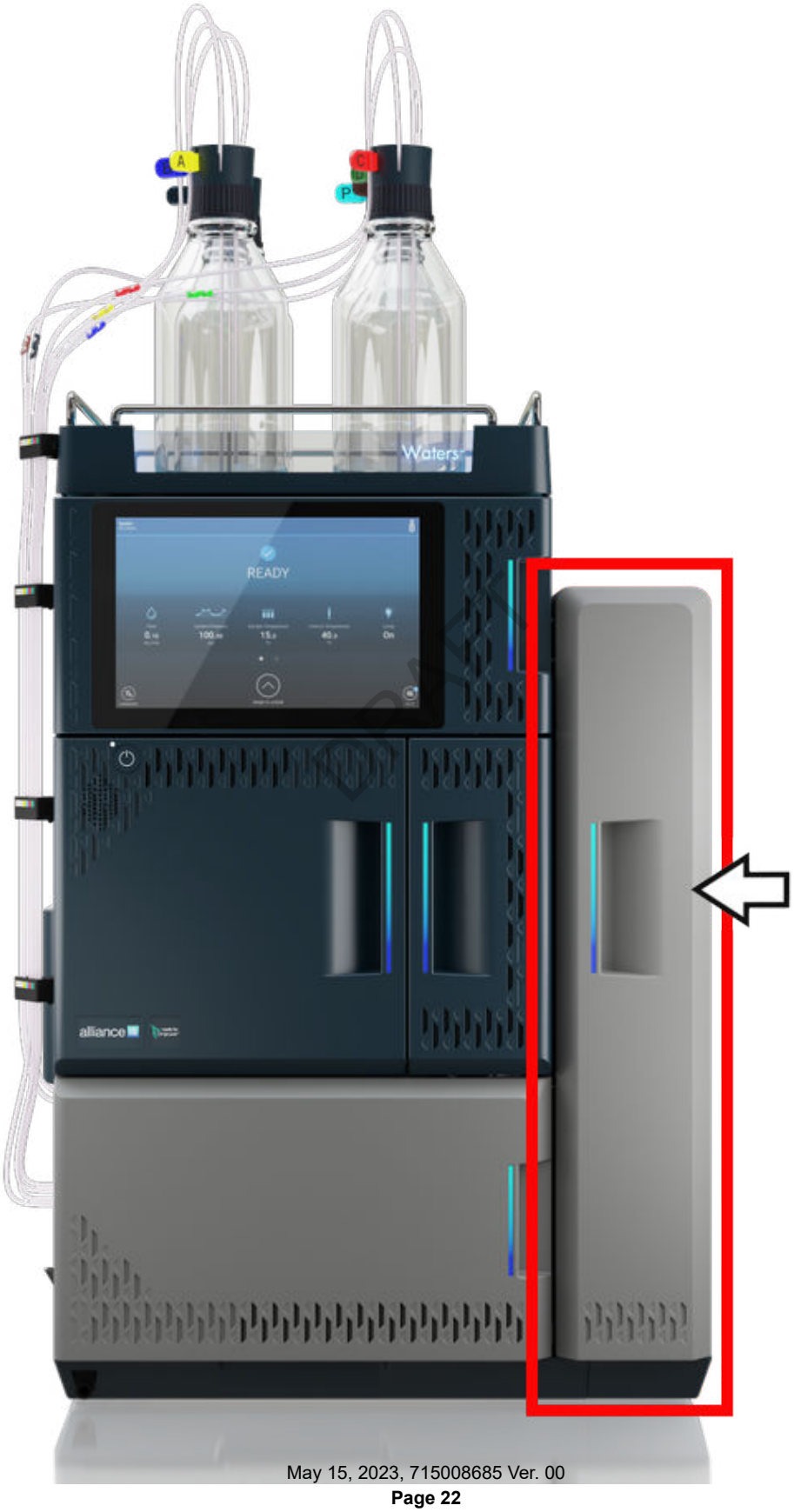
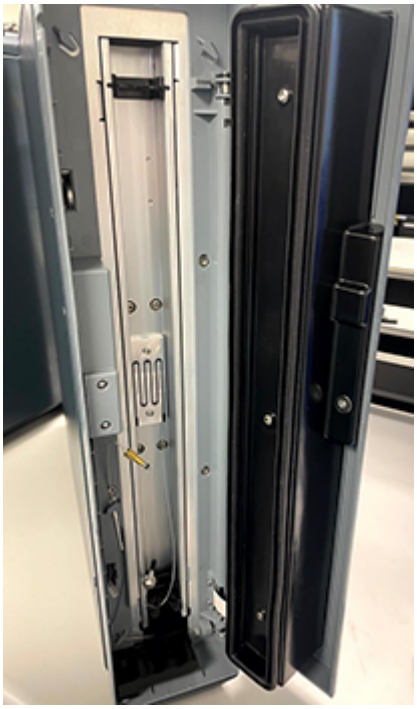


Figure 3–2: Alliance iS Column Heater Cooler (CHC) with door open



3.1 Features

The Alliance iS Column Heater Cooler (CHC) supports the Alliance iS HPLC System with the following features and capabilities:

- Supports HPLC columns of various sizes, lengths, and diameters. The CHC can accommodate columns up to 8.0-mm ID and up to 300-mm length.
- Provides heating and cooling of the column from 4 to 90 °C, user-selectable.
- The input connection is fitted with an passive preheater that preheats the solvent prior to it entering the column.
- Installation of column using tool-free fittings.
- Optionally equipped with Near Field Communication (NFC) RFID to automatically read/write columns with supported passive RFID tags (not available in all countries). This is the only NFC/RFID circuitry within the Alliance iS HPLC System.

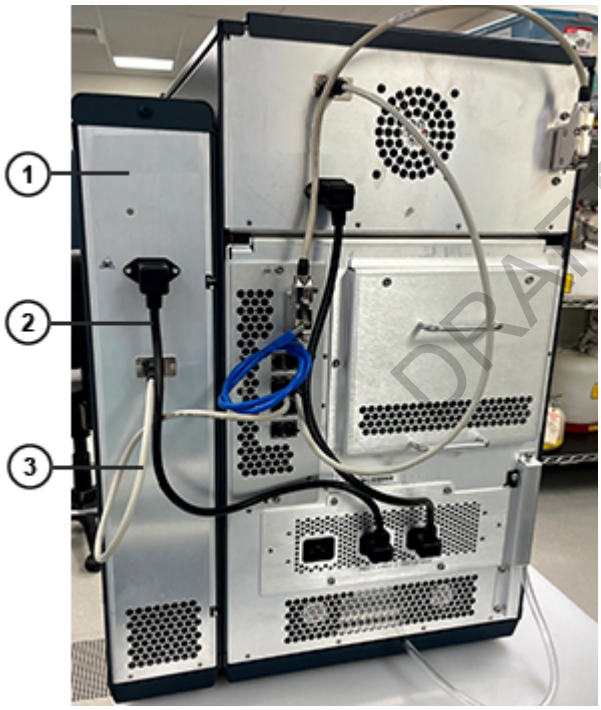
4 Instrument startup

This section helps you set up and start your Waters system. Proper setup is critical to successful operation of the system. The Alliance iS Column Heater Cooler (CHC) comes preassembled as part of the Alliance iS HPLC System. Refer to the Alliance iS HPLC System startup instructions.

4.1 CHC power and network connections

The power cord and network cable come preinstalled.

Figure 4–1: Alliance iS CHC, rear



1. CHC
2. Power cable
3. Network cable

4.2 Setting up the instrument

4.2.1 Replacing the column

Waters eConnect tag-enabled columns use near-field communication (NFC) technology that provides an automated solution for identifying and tracing HPLC columns and their usage history. To ensure high-quality chromatographic data, replace the column annually, or any time you notice peak shape problems or loss of resolution.

Warning: To avoid personal contamination with biologically hazardous or toxic compounds, wear clean, chemical-resistant, powder-free gloves when performing this procedure.

Warning: To prevent burn injuries, allow sufficient time for the column to cool before opening the compartment door. The column, compartment, tubing, fittings, and door liner can be hot.

To remove the existing column:

If installing a Waters-branded column, this procedure requires no tools. You can easily replace it using the column clips and tool-free fittings.

Note: Before removing the column, you can flush the column using the system touchscreen or Touchscreen App. This step is important, especially if you are planning to move the column to storage and reuse it later. Tap **Maintain** > **Replace components** > **Replace Column**. Then tap **NEXT** and follow the onscreen instructions to flush the column.

1. Open the column compartment door.
2. Use one of the following methods to access the Replace Column workflow from the system touchscreen or Touchscreen App:
   - Tap **Maintain** > **Replace components** > **Replace Column**.
   - From the Main System dashboard, tap the Column icon in the Component Selector image. Next, tap the Column (Installed) Condition card. Then, from the Column Details card, tap **ACTIONS** > **Replace Column**.

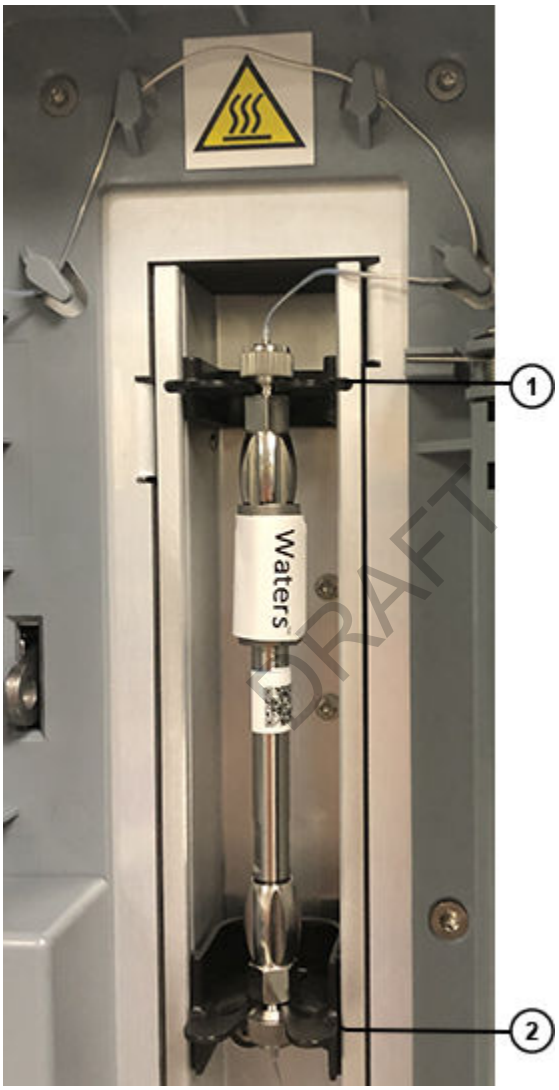
   Note: For safety, the system automatically shuts off column temperature and flow.
3. Before removing the column, use the touchscreen to verify that the compartment temperature is sufficiently cool. Tap **Maintain** > **Replace components** > **Replace Column**. Then tap **NEXT** to view the compartment temperature.

   Tip: If the column is too hot, a warning appears.
4. Remove the column from the two black clips that secure it in place:

a. Locate the fitting on the bottom of the column, and then pull the bottom of the column out of the black clip.

b. Next, remove the upper part of the column. Holding the bottom of the column in one hand, locate the fitting on the top and use your other hand to pull the top part of the column out of the black clip.

Figure 4–2: Removing the column from the black clips



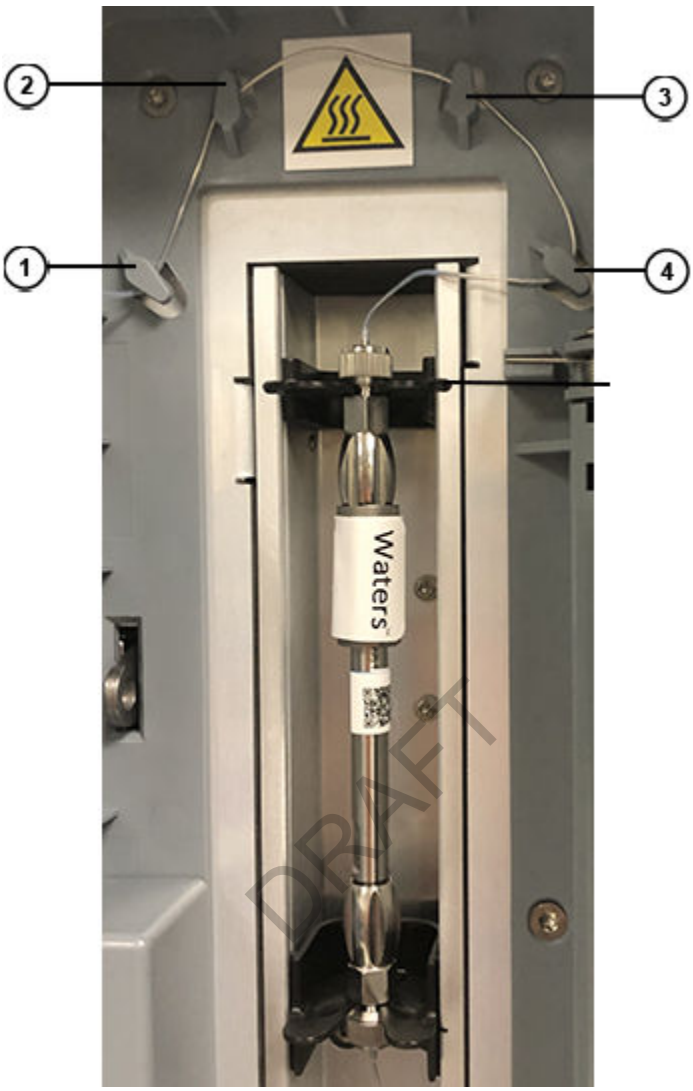
1 Top black clip

2 Bottom black clip

c. Locate the fasteners that secure the tubing at the top of the column compartment, and then remove the tubing from fasteners 2 through 4 only.

Tip: You will not remove the tubing from fastener 1 because it secures the tubing to another module and should remain connected.

Figure 4–3: Four fasteners that secure the tubing



d. Unscrew the fitting located on the bottom of the column and set aside to install the new column.

e. Unscrew the fitting located on the top of the column and set aside to install the new column. Follow the remaining steps to install the new column.

5. Remove the protective plugs from the top and the bottom of the new column, and then place in the column shipping carton for future use during storage.
6. Orient the column so that the outlet faces up (see the arrow on the column) and the inlet faces down.
7. Screw the column inlet and column outlet tool-free fittings you set aside earlier onto the column finger-tight.
8. If necessary, adjust the lower column clip to match the size of the new column.
9. Install the tubing by routing it into fasteners 2 through 4 located at the top of the column compartment.

10. Insert the column into the upper and lower black clips, ensuring that each black clip grasps the exposed threads on the tool-free fitting.

Figure 4–4: Installing the replacement column

11. Close the column compartment door.

Note: Verify that the tubing is situated inside the compartment before you close the column compartment door.

12. Configure the new column. Tap **Maintain** > **Replace components** > **Replace Column**. Then tap **NEXT** and follow the onscreen instructions to configure the column as required.

4.2.2 Powering-on the Alliance iS Column Heater Cooler (CHC)

After the system is plugged in and powered-on, the CHC has power.

5 Daily routine analysis

5.1 Using Empower software for system operation

Refer to the Alliance iS HPLC System documentation.

6 Disposal protocols

Disposal of system components is performed either by Waters personnel or by the customer per local jurisdiction.

6.1 Description of constituent materials

For detailed descriptions of Waters materials, see Safety Data Sheets on waters.com.

6.2 Disposal of system components

Disposal of system components is performed either by Waters personnel or by the customer per local jurisdiction.

7 Solvent considerations

Warning: Observe Good Laboratory Practice (GLP) at all times, particularly when working with hazardous materials. Consult the Safety Data Sheets regarding the solvents you use. Additionally, consult the safety representative for your organization regarding its protocols for handling such materials.

This section covers the solvent considerations necessary when operating the Alliance iS System. This information applies only to the Alliance iS System and components.

7.1 Preventing contamination

Explore the Waters website for resources on controlling contamination.

For information about preventing and eliminating contamination, refer to *Controlling Contamination in LC/MS Systems* (715001307) on the Waters website (www.waters.com).

7.1.1 Clean solvents

Waters stresses the importance of always using clean solvents in your system.

Clean solvents ensure reproducible results and permit system operation with minimal need for maintenance.

Dirty solvents can cause baseline detector noise and drift, and they can clog solvent reservoir filters, inlet filters, and capillary lines.

7.1.2 Solvent quality

For the best possible results, use MS-grade solvents.

The minimum requirement for solvents is HPLC-grade. Filter solvents through an appropriate membrane filter.

Recommendation: To ensure that the filter is appropriate for the solvents used, heed the recommendations of the filter's manufacturer or vendor.

7.1.3 Solvent preparation

Proper solvent preparation, primarily filtration, can prevent many pumping problems.

Recommendation: Store mobile phases in borosilicate glass reservoirs type 1, class A[2] or type 3.3[3]. Use high-quality, brown-tinted glassware to inhibit microbial growth. Use aluminum foil or Waters caps to cover the reservoirs.

7.1.4 Water

Use water only from a high-quality water purification system.

> **Notice:** Using 100% water can cause microbial growth. Waters recommends changing 100% water solutions daily. Adding a small amount (~10%) of an organic solvent prevents microbial growth.

If the water system does not deliver filtered water, filter the water through a 0.2-µm membrane filter.

7.1.4.1 Using buffers

When using a buffer, choose good quality reagents, filtering them through a 0.2-µm membrane filter.

Adjust the pH of aqueous buffers. Filter them to remove insoluble material, and then blend them with appropriate organic modifiers. After you use a buffer, flush it from the pump by wet priming using at least five system volumes of HPLC-grade distilled or deionized water.

For shutdowns of more than a day's duration, flush the pump with a 20% methanol (MeOH)/water solution to prevent microbial growth.

See also: For information on preventing contamination, refer to *Controlling Contamination in LC/MS Systems* (715001307) on the Waters website (www.waters.com).

7.1.4.1.1 Buffered solvents

When using a buffer, choose good quality reagents, filtering them through a 0.2-µm membrane filter.

Recommendation: To discourage microbial growth, replace 100% mobile aqueous phase daily.

See also: For information on preventing contamination, refer to *Controlling Contamination in LC/MS Systems* (715001307) on the Waters website (www.waters.com).

8 Specifications

The operating and performance specifications presented here depend on the conditions in individual laboratories. Refer to the *Alliance iS Site Preparation Guide* or contact the Waters Technical Service organization for additional information about specifications.

8.1 Instrument specifications

The tables in this section detail the specifications for the Alliance iS Column Heater Cooler (CHC). Refer to the Alliance iS HPLC System Guide for system-level specifications.

8.1.1 Environmental specifications

Table 8–1: Alliance iS Column Heater Cooler (CHC) environmental specifications

Attribute	Specification
Usage location	For indoor use only
Acoustic noise, system	<48 dBA
Ambient operating temperature	4 to 40 °C
Operating temperature stability	ΔT ≤ ±2 °C/hr
Ambient operating humidity	10% to 96%, non-condensing
Operating altitude	≤3500 m
Ambient transportation and storage temperature	-30 °C to 60 °C
Ambient transportation and storage humidity	20% to 80% relative humidity, non-condensing
Moisture protection	Normal (IPXO), indoors

8.1.2 Electrical specifications

Note: The Alliance iS Column Heater Cooler (CHC) must be powered from the auxiliary AC outlet on the system power supply using the preinstalled power cord. The CHC power consumption listed here is included in the system power rating.

Table 8–2: Alliance iS Column Heater Cooler (CHC) electrical specifications

Attribute	Specification
Power requirements	100 to 240 Vac +/- 10%

Table 8–2: Alliance iS Column Heater Cooler (CHC) electrical specifications (continued)

Attribute	Specification
Line frequency	50–60 Hz
Power consumption	350 VA
Protection class[a]	Class 1
Overvoltage category[b]	II
Pollution degree[c]	2

a. The insulating scheme used in the instrument to protect from electrical shock. Class I identifies a single level of insulation between live parts (wires) and exposed conductive parts (metal panels), in which the exposed conductive parts are connected to a grounding system. In turn, this grounding system is connected to the third pin (ground pin) on the electrical power cord plug.

b. Pertains to instruments that receive their electrical power from a local level such as an electrical wall outlet.

c. A measure of pollution on electrical circuits, which may produce a reduction of dielectric strength or surface resistivity. Degree 2 refers only to normally nonconductive pollution. Occasionally, however, expect a temporary conductivity caused by condensation.

Table 8–3: RF information

Type	RFID/NFC
Wireless module info	Not used
RFID reader	ISO15693
Frequency bands	13.56 MHz
Frequency range	13.553 MHz–13.675 MHz
Modulation, RFID reader to tag	ASK 5% of carrier
Modulation, RFID tag	ASK 100% modulation index, 423.75kHz subcarrier
Output power	62.252 dBuV/m @ 3 m
EIRP max. transmit power	10 dBm
Antenna type	Single PCB magnetic loop coupled trace
Antenna gain	N/A for NFC devices
FCC ID	2A93G-PCH-CHC-001
IC ID	IC: 29985-CHC-PHC-001

8.1.3 Physical specifications

Table 8–4: Alliance iS Column Heater Cooler (CHC) physical specifications

Attribute	Specification
Height	59.7 cm (23.5 inches)

Table 8–4: Alliance iS Column Heater Cooler (CHC) physical specifications (continued)

Attribute	Specification
Width	11.4 cm (4.5 inches)
Depth	61.7 cm (24.3 inches)
Weight	11.3 kg (25.0 lbs)