

# Ion GeneStudio™ S5 Food Protection System

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This guide contains the information that is needed to prepare your site for installation of an Ion GeneStudio™ S5 Food Protection System, Ion GeneStudio™ S5 Plus Food Protection System, and Ion GeneStudio™ S5 Prime Food Protection System. An external Ion Torrent™ Server is required for use with the Ion GeneStudio™ S5 Prime Food Protection Instrument and is included in the Ion GeneStudio™ S5 Prime Food Protection System.

**Note:** In this guide, Ion GeneStudio™ S5 Food Protection Instrument or System refers generically to the series of three Ion GeneStudio™ S5 Food Protection Instruments or Systems, unless otherwise specified.

## Site preparation workflow

A Thermo Fisher Scientific representative will contact you to schedule the installation. When the installation is scheduled:

1. Receive and inspect the shipment of the Ion GeneStudio™ S5 Food Protection System (see “Receive and inspect the shipment” on page 21).
2. Move the crated Ion GeneStudio™ S5 Food Protection Instrument to the installation site (see “Move the crated instrument to the installation site” on page 21).
3. Complete the site preparation checklist (see “Site preparation checklist” on page 3).
4. Ensure that:
  - The site preparation checklist is complete.
  - The purchase order is complete.

## **Installation timeline and training**

After your Ion GeneStudio™ S5 Food Protection Instrument is uncrated, installation and testing of the Ion GeneStudio™ S5 Food Protection System takes approximately 8 hours.

The Ion Chef™ Food Protection System is purchased and installed separately. Installation requires an additional 4 to 6 hours.

During or after installation, the Thermo Fisher Scientific service representative reviews data and provides basic operator training. For additional training and reference information, see the user documents that are provided with the Ion GeneStudio™ S5 Food Protection System.

## Site preparation checklist

**IMPORTANT!** Complete, date, and initial all items in the following checklist before the scheduled installation date. If the site preparation checklist is not complete when the Thermo Fisher Scientific service representative arrives, the scheduled installation can be postponed.

✓	Date	Initials	Site preparation requirement	See page
<input type="checkbox"/>			Customer responsibilities have been reviewed and personnel have been assigned.	4 –5
<input type="checkbox"/>			The installation site is identified and meets requirements:	
			<input type="checkbox"/> Space and clearance	5
			<input type="checkbox"/> Environmental	13
			<input type="checkbox"/> Electrical	16
			<input type="checkbox"/> Network	18 –22
			<input type="checkbox"/> Safety	19 –23
<input type="checkbox"/>			All materials needed for installation and operation are available.	20
<input type="checkbox"/>			The instrument was received and inspected:	21
			<input type="checkbox"/> All items on the shipping list are the same items ordered at the time of purchase.	
			<input type="checkbox"/> Any damage to shipping containers was reported to the shipping company that delivered the instrument.	
			<input type="checkbox"/> Any damage or mishandling was recorded on the shipping documents.	
			<input type="checkbox"/> The reagents box was unpacked and stored as specified.	
<input type="checkbox"/>			The installation site is cleared and ready for instrument installation.	21
<input type="checkbox"/>			The crated instrument and other shipping containers are moved to the installation site.	

## Customer responsibilities

Personnel	Responsibilities
Site preparation/ installation coordinator	<ul style="list-style-type: none"> <li>• Reviews the site preparation guide for safety information and instrument requirements.</li> <li>• Coordinates personnel and tasks.</li> <li>• Chooses the site.</li> <li>• Reviews checklists with applicable personnel, then with the service representative to verify that the site is properly prepared.</li> <li>• Receives and inspects the Ion GeneStudio™ S5 Food Protection Instrument.</li> <li>• Stores the reagents box according to the specifications indicated in the product inserts.</li> <li>• Schedules the installation and informs personnel of the installation day.</li> <li>• Ensures that the site is clear of unnecessary material on the installation day.</li> <li>• Is available to assist the service representative throughout installation.</li> </ul>
Laboratory safety representative	<ul style="list-style-type: none"> <li>• Reviews the site preparation guide for safety information.</li> <li>• Ensures that the required safety practices and equipment are in place.</li> <li>• Is in the vicinity and available to the service representative at all times while the service representative is at the customer's facility.</li> </ul>
Laboratory personnel/ primary users	<ul style="list-style-type: none"> <li>• Review safety information.</li> <li>• Ensures that all customer-provided materials for installation are present at the site.</li> <li>• Ensures that primary users (responsible for training other users) are available during the installation, so that they can be trained on the instrument.</li> </ul>
Facilities personnel	<ul style="list-style-type: none"> <li>• Ensures that the installation requirements are met for:             <ul style="list-style-type: none"> <li>– Space at the installation site</li> <li>– Building clearances</li> <li>– Temperature and humidity</li> <li>– Waste collection</li> <li>– Electrical supply</li> <li>– Computer</li> <li>– Safety and installation materials</li> </ul> </li> <li>• If possible, moves the crated Ion GeneStudio™ S5 Food Protection Instrument to the site before the installation date.</li> <li>• Is available to assist service representative and laboratory personnel throughout installation.</li> <li>• If applicable, ensures that at least two people are available to help the service representative move and position the instrument.</li> </ul>

Personnel	Responsibilities
Network or IT specialist (if the instrument will be connected to a network)	<ul style="list-style-type: none"> <li>• Ensures that active, tested local area network (LAN) connections are in place before the scheduled installation date.</li> <li>• Ensures that network hardware is compatible with an RJ45-type connector.</li> <li>• If necessary, supplies additional cables.</li> <li>• Is available during installation to connect the Ion GeneStudio™ S5 Food Protection Instrument to the network.</li> <li>• If applicable, provides and installs a network or dedicated printer.</li> </ul> <p><b>IMPORTANT!</b> Do not attempt to connect the Ion GeneStudio™ S5 Food Protection Instrument components to the network before the service representative arrives.</p>

## Site requirements

### Dimensions and weights

To prepare for installation, provide space for receipt and configuration of the components listed in this section. This section provides dimensions and weights for the packages you will receive, and it describes the dimensions of the components after installation and configuration.

### Crates and packages



**WARNING! PHYSICAL INJURY HAZARD.** Do not attempt to lift or move the crated instrument without professional assistance. The crated instrument is heavy. Any incorrect lifting or moving of the crated instrument can cause serious injury.

Ensure that the building clearances allow for the passage of the instrument crates and packages.

Crate	Height	Length (depth)	Width	Weight
Ion GeneStudio™ S5 Food Protection Instrument	25.5 in (64.8 cm)	39 in (99 cm)	28 in (71.1 cm)	200 lbs (90.7 kg)
Ion GeneStudio™ S5 Plus Food Protection Instrument	25.5 in (64.8 cm)	39 in (99 cm)	28 in (71.1 cm)	200 lbs (90.7 kg)
Ion GeneStudio™ S5 Prime Food Protection Instrument	25.5 in (64.8 cm)	39 in (99 cm)	28 in (71.1 cm)	200 lbs (90.7 kg)
Ion Torrent™ Server <sup>[1]</sup>	28.3 in (71.9 cm)	27.8 in (70.6 cm)	13.5 in (34.3 cm)	116.9 lbs (53.0 kg)
Ion Chef™ Food Protection Instrument	28 in (71.1 cm)	34 in (86.4 cm)	34 in (86.4 cm)	295 lbs (134.0 kg)

<sup>[1]</sup> Required for use with the Ion GeneStudio™ S5 Prime Food Protection Instrument.

## Components

Ensure that the installation site bench space is level and can accommodate the dimensions and support the weights.

Component	Height		Length (depth)	Width		Weight
	Open	Closed		Open	Closed	
Ion GeneStudio™ S5 Food Protection Instrument	—	20 in (50.9 cm)	31.75 in (80.6 cm)	34 in (86.4 cm)	21.4 in (54.2 cm)	140 lbs (63.5 kg)
Ion GeneStudio™ S5 Plus Food Protection Instrument	—	20 in (50.9 cm)	31.75 in (80.6 cm)	34 in (86.4 cm)	21.4 in (54.2 cm)	140 lbs (63.5 kg)
Ion GeneStudio™ S5 Prime Food Protection Instrument	—	20 in (50.9 cm)	31.75 in (80.6 cm)	34 in (86.4 cm)	21.4 in (54.2 cm)	140 lbs (63.5 kg)
Ion Torrent™ Server <sup>[1]</sup>	—	17.5 in (44.4 cm)	27.5 in (69.8 cm)	—	12.1 in (30.8 cm)	101.4 lbs (46.0 kg)
Ion Chef™ Food Protection Instrument	33 in (83.9 cm)	22.1 in (56.1 cm)	27.6 in (70.0 cm)	—	28.1 in (71.4 cm)	150 lbs (68.2 kg)

<sup>[1]</sup> Required for use with the Ion GeneStudio™ S5 Prime Food Protection Instrument.



### **WARNING! PHYSICAL INJURY HAZARD.**

Do not attempt to lift or move the instrument without professional help. The instrument is heavy. Any incorrect lifting or moving of the instrument can cause serious injury.

## Instrument clearances

During instrument setup and maintenance, it is necessary to access the back and sides of all instruments. If the back of an instrument component faces a wall, it is necessary to have enough space to allow rotation of the instrument on the bench for access.

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**IMPORTANT!** For safety, the power outlet that is used for powering the instrument components must be accessible always.

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Component	Top	Front	Left/right	Back
Ion GeneStudio™ S5 Food Protection Instrument	12.0 in (30.5 cm)	12.0 in (30.5 cm) <sup>[1]</sup>	4.0 in/12 in (10.0 cm/30.5 cm) <sup>[2]</sup>	12.0 in (30.5 cm)
Ion GeneStudio™ S5 Plus Food Protection Instrument	12.0 in (30.5 cm)	12.0 in (30.5 cm) <sup>[1]</sup>	4.0 in/12 in (10.0 cm/30.5 cm) <sup>[2]</sup>	12.0 in (30.5 cm)
Ion GeneStudio™ S5 Prime Food Protection Instrument	12.0 in (30.5 cm)	12.0 in (30.5 cm) <sup>[1]</sup>	4.0 in/12 in (10.0 cm/30.5 cm) <sup>[2]</sup>	12.0 in (30.5 cm)
Ion Torrent™ Server	2.0 in (5.0 cm)	12.0 in (30.5 cm)	2.0 in (5.0 cm)	61.0 cm (24.0 in)
Ion Chef™ Food Protection Instrument	14 in (35.6 cm)	6.7 in (17.0 cm)	4.0 in (10.0 cm)	4.0 in (10.0 cm)

<sup>[1]</sup> The instrument requires 36.0 in (90.0 cm) aisle in front of bench for operator access.

<sup>[2]</sup> To allow sufficient clearance for the instrument door to open.

## Placement of the instruments

If any of the instruments will be placed on a mobile bench, verify that the bench is level and meets the requirements in “Crates and packages” on page 5.

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**IMPORTANT!** All instruments must be installed on a level surface.

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**Note:** Thermo Fisher Scientific is not responsible for any damage caused by using a laboratory bench that does not meet the minimum weight capacity requirements mentioned above.

## Ion GeneStudio™ S5 Food Protection System component configuration and layout

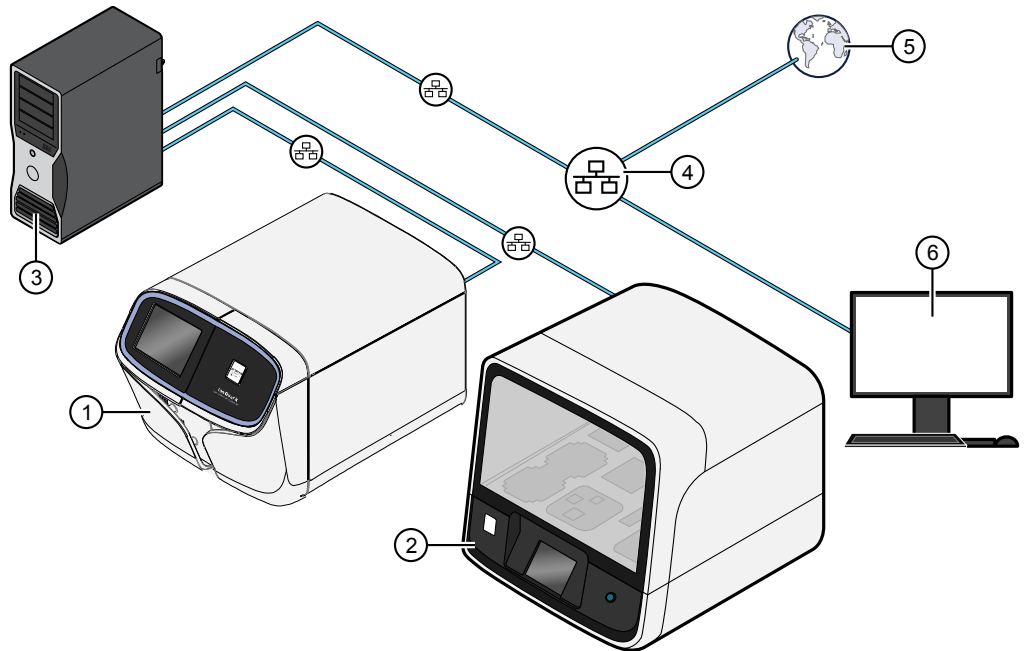
The Ion GeneStudio™ S5 Food Protection Instrument uses a virtual server, and the Ion GeneStudio™ S5 Plus Food Protection Instrument is equipped with an internal Ion Torrent™ Server. These instruments are not connected to an external Ion Torrent™ Server.

The Ion GeneStudio™ S5 Prime Food Protection System includes the Ion GeneStudio™ S5 Prime Food Protection Instrument and an external Ion Torrent™ Server. We support the layout in which the external Ion Torrent™ Server is connected directly to the Ion GeneStudio™ S5 Prime Food Protection Instrument, instead of through a local area network from a remote location such as a server room. Data are most robustly transferred from the Ion GeneStudio™ S5 Prime Food Protection Instrument to the Ion Torrent™ Server when they are connected directly by a standard Category 6 Ethernet cable that is provided with the installation materials.

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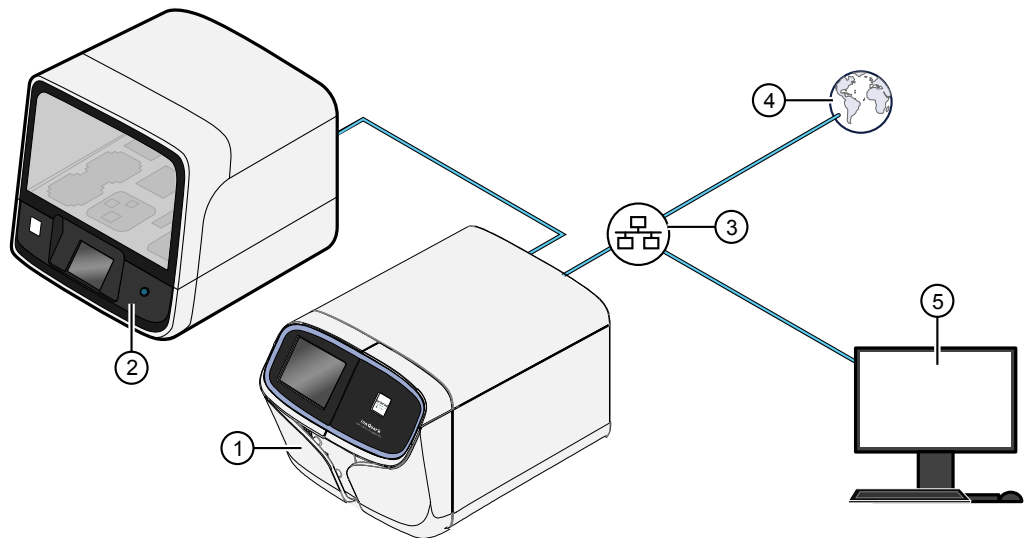
**IMPORTANT!** The Ion GeneStudio™ S5 Prime Food Protection Instrument must be connected to the Ion Torrent™ Server by a standard Category 6 Ethernet cable. We do not troubleshoot data transfer problems that are associated with an indirect connection between the Ion GeneStudio™ S5 Prime Food Protection Instrument and the Ion Torrent™ Server.

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Ion GeneStudio™ S5 Prime Food Protection System configuration

- ① Ion GeneStudio™ S5 Prime Food Protection Instrument
- ② Ion template preparation instrument (Ion Chef™ Instrument (shown) or Ion OneTouch™ 2 System)
- ③ Ion Torrent™ Server
- ④ Local area network
- ⑤ Internet
- ⑥ Client computer



Ion GeneStudio™ S5 Food Protection System, or Ion GeneStudio™ S5 Plus Food Protection System configuration

- ① Ion GeneStudio™ S5 Food Protection Instrument, or Ion GeneStudio™ S5 Plus Food Protection Instrument
- ② Ion template preparation instrument (Ion Chef™ Instrument (shown) or Ion OneTouch™ 2 System)
- ③ Local area network
- ④ Internet
- ⑤ Client computer



## Internet connectivity

The Ion GeneStudio™ S5 Food Protection Instrument should be connected to a network with internet access. Connecting to the Internet allows you to update your software and access remote system support easily. Software updates through the network/Internet are free. If you do not connect your instrument or server to a network, software updates must be manually installed via USB.

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**IMPORTANT!** Thermo Fisher Scientific does not support the USB method for updating software.

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Any problems (for example, file corruption, incomplete updates) resulting from update of the instrument or server using a USB device that require correction of the faulty update is not covered by your Ion GeneStudio™ S5 Food Protection System warranty or any service contract you may have bought. You are required to schedule an on-site Time and Materials visit by a field service engineer to correct the problem at your own expense.

In providing outbound access to the Internet from the server, you enable the support team to provide inbound support. The Ion GeneStudio™ S5 Food Protection Instrument runs a remote monitor agent that can provide service personnel with critical system information, such as installed software versions and instrument alarms. With your permission, the agent also allows service personnel to access remotely the Ion GeneStudio™ S5 Food Protection Instrument, which is required for system support. Without remote access, service personnel cannot access, view, and troubleshoot problems regarding machine performance.

To enable full support, the Ion Torrent™ Server must have outbound internet access (ports 22, 80, and 443) and be behind an appropriately configured firewall. Although not recommended, you can enable access to the Torrent Browser (the web server running on the Ion Torrent™ Server from the Internet). If you provide such access, you must restrict access to the server using HTTP and AUTH firewall rules, or a combination of the two. Implementing and maintaining such restrictions is the responsibility of your server administrator and not of Thermo Fisher Scientific.

## Planning the installation

When preparing for system installation, you must plan the layout of your laboratory to accommodate library and template preparation activities, in addition to those related to chip preparation and sequencing. This section describes the stations involved in the sequencing workflow and the basic laboratory layouts.

### Layout of instruments and equipment

When designing your PCR laboratory layout, follow good laboratory practices to ensure reliable and contamination-free PCR results. Pay particular attention to the need to separate the areas for pre- and post-PCR activities. Isolating the amplicon source, separating pre-PCR from post-PCR activities, and dedicating laboratory supplies and/or equipment to each space can significantly reduce the potential for contamination.

You can deploy the system in both one- and two-room laboratory configurations. The two-room layout is highly recommended due to the protection that it affords against contamination. However, the suboptimal one-room layout produces acceptable results when proper precautions are observed.

If you deploy the system in a one-room layout:

- Establish clearly-labeled, separate sets of pipettes for pre-PCR activities (for example, DNA amplification) and post-PCR activities (for example, library purification and quantification).
- Always move from "clean" to "dirty" (for example, from pre- to post-PCR). We do not recommend moving from "dirty" to "clean" (for example, do not handle post-amplification samples and then make libraries).

**Note:** The positions of the stations in the pre- and post- PCR rooms are not important.

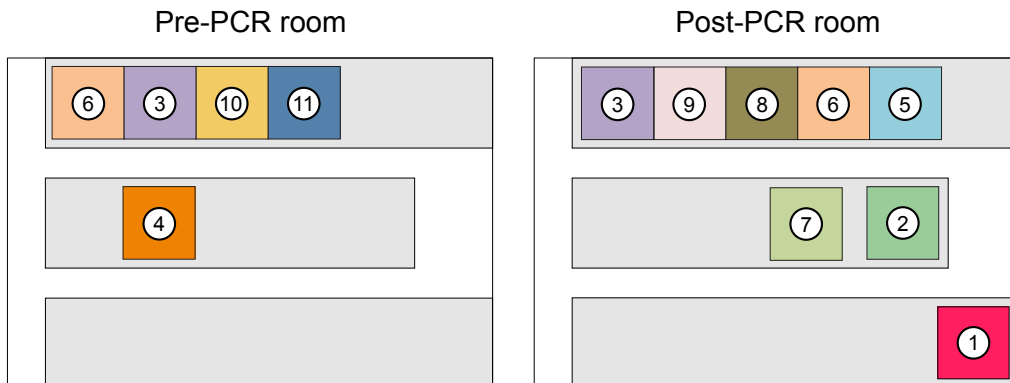


Figure 1 Two-room layout

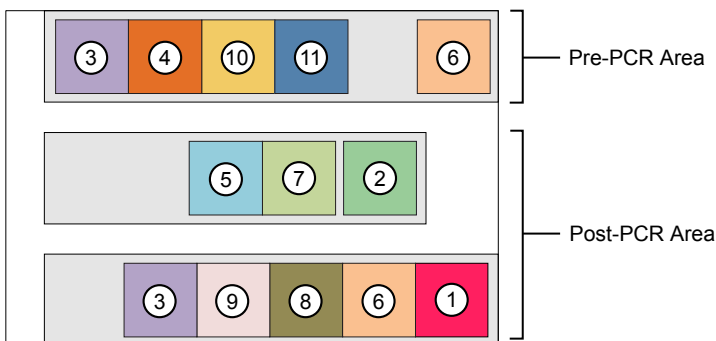


Figure 2 One-room layout

- ① Ion Chef™ Food Protection Instrument
- ② Ion GeneStudio™ S5 Food Protection Instrument and server, if applicable
- ③ Centrifuge
- ④ Amplification mixture setup hood
- ⑤ Library pool preparation hood
- ⑥ Pipettes
- ⑦ Gel electrophoresis
- ⑧ Qubit™ Fluorometer
- ⑨ Thermal cycler
- ⑩ Sample homogenization station
- ⑪ DNA extraction station

## Laboratory workstations

The following table describes workstations that are associated with a generic laboratory layout. The stations are categorized in terms of their involvement pre- and post-PCR activities. Note that some stations (pipette and centrifuge) are present in both environments, but the equipment is not necessarily shared between the pre- and post-PCR stations.

#	Station	Location	Description/requirements
1	Ion Chef™ Food Protection Instrument	Post-PCR area	<p>When planning the placement of the instrument, ensure that the location meets all clearance and environmental requirements described in this document.</p> <p><b>Note:</b> If possible, connect the instrument to a dedicated power outlet.</p>
2	Ion GeneStudio™ S5 Food Protection Instrument	Post-PCR area	<p>When planning the placement of the instrument, ensure that the location meets all clearance and environmental requirements described in this document.</p> <p><b>Note:</b> If possible, connect the instrument to a dedicated power outlet.</p> <p><b>IMPORTANT!</b> The instrument is sensitive to electrical noise, vibration, and temperature changes.</p>
3	Centrifuges	Pre- and post-PCR areas	<p>Centrifuges are used during library preparation, so access is required in both the pre- and post-PCR areas.</p> <p>When planning centrifuge placement:</p> <ul style="list-style-type: none"> <li>• Consider dedicating separate centrifuges for the pre- and post-PCR operations to minimize contamination.</li> <li>• If only one centrifuge is available, place it in a central location, which is accessible from both areas.</li> <li>• To limit vibrational interference, do not place centrifuges on the same bench as the Ion GeneStudio™ S5 Food Protection Instrument.</li> <li>• Most importantly, place the centrifuges in convenient locations.</li> </ul>
4	Amplification mixture setup hood	Pre-PCR area	<p>Whenever possible, perform amplification mixture preparation in a dedicated hood. When selecting a location for amplification mixture preparation:</p> <ul style="list-style-type: none"> <li>• The amplification mixture setup station requires a set of dedicated pipettes.</li> <li>• If only one hood is available in the pre-PCR area, dedicate the hood for amplification mixture preparation.</li> <li>• If a hood is unavailable in the pre-PCR area, select a bench that is sterilized regularly and preferably isolated from the neighboring stations.</li> </ul> <p><b>IMPORTANT!</b> Separation of the amplification mixture preparation area from the other stations is critical to preventing contamination.</p>

#	Station	Location	Description/requirements
5	Library pool preparation hood	Post-PCR area	<p>Whenever possible, perform library pool preparation in a dedicated hood. The use of a dedicated hood allows for UV treatment of the library pool preparation area and minimizes contamination from post-PCR material containing adaptors.</p> <p>When selecting a location for library pool preparation:</p> <ul style="list-style-type: none"> <li>• In a one-room laboratory layout, the use of a dedicated hood for library pool preparation is highly recommended, but not required.</li> <li>• The library pool area setup station requires a set of dedicated pipettes.</li> <li>• If a dedicated hood is unavailable, select a bench that is preferably isolated from the neighboring stations.</li> </ul>
6	Pipettes	Pre- and post-PCR areas	Both the pre- and post-PCR areas require a complete set of dedicated pipettes.
7	Gel electrophoresis	Post-PCR area	<p>Whenever possible, perform gel electrophoresis in a dedicated hood. The use of a dedicated hood allows for UV treatment and minimizes contamination.</p> <p>When selecting a location for gel electrophoresis of post-PCR material.</p> <ul style="list-style-type: none"> <li>• In a one-room laboratory layout, we highly recommend the use of a dedicated hood for gel electrophoresis.</li> <li>• If a dedicated hood is unavailable, select a bench that is isolated from the neighboring stations.</li> </ul>
8	Qubit™ System	Post-PCR area	You can use the Qubit™ 4 Fluorometer to perform library quantification or quality control following PCR or just before library preparation.
9	Thermal cycler	Post-PCR area	Use a 96-well thermal cycler to perform amplification during library preparation. When selecting a location for the thermal cycler, ensure that the location meets all clearance and environmental requirements for the instrument.
10	Sample homogenization station	Pre-PCR area	<p>The sample homogenization working area should be properly cleaned before and after processing each sample to prevent cross-contamination with other processed samples.</p> <p>Cleaning of the sample homogenization working area should include products for disinfection and cleaning and removal of DNA (such as ethanol (70%), bleach (1:10), or commercial DNA removal products).</p> <p>If possible, disposable table covers replaced after each sample can be used to minimize the risk of cross-contamination.</p>
11	DNA extraction station	Pre-PCR area	<p>In those steps where opening microtubes is required or discarding solutions and supernatants is necessary, all samples must be handled carefully to avoid cross-contamination and bias of DNA sequencing results.</p> <p>Cleaning of the sample homogenization working area should include products for disinfection and cleaning and removal of DNA (such as ethanol (70%), bleach (1:10), or commercial DNA removal products).</p>

## Environmental requirements

Ensure that the installation room is maintained under correct environmental conditions. Avoid placing the instrument or server next to heaters, cooling ducts, or in direct sunlight. Place the instrument at least 1 meter away from major sources of electronic noise such as refrigerators or microwaves. Fluctuations between day and night temperatures can cause system instability.

Component	Acceptable range
Altitude	Locate between sea level and 6,500 ft (2,000 m) above sea level
Humidity	Ion GeneStudio™ S5 Food Protection Instrument: 40–60%, non-condensing Ion Chef™ Food Protection Instrument: 40–60%, non-condensing
Operating Temperature	Ion GeneStudio™ S5 Food Protection Instrument: 20°C to 30°C (68°F to 86°F) <b>Note:</b> The room temperature must not fluctuate more than 2°C over a 2-hour period. Ion Chef™ Food Protection Instrument: 20°C to 25°C (68°F to 77°F)
Vibration	Install the instrument(s) on benches that have no contact with equipment that causes vibration (freezers, pumps, and similar equipment). Significant vibration during sequencing can add noise and reduce the quality of the sequencing measurements. <b>Note:</b> Where possible we recommend placing the Ion GeneStudio™ S5 Food Protection Instrument on a separate bench from the Ion GeneStudio™ S5 Food Protection Instrument because the Ion Chef™ Food Protection Instrument can itself cause vibration.
Pollution	The Ion GeneStudio™ S5 Food Protection Instrument and the Ion Chef™ Food Protection Instrument are for use in Office or Laboratory controlled environments.
Overvoltage category	The Ion GeneStudio™ S5 Food Protection Instrument and the Ion Chef™ Food Protection Instrument have installation (overvoltage) categories of II (2), and are classified as portable equipment.
Other conditions	For indoor use only. Install the Ion GeneStudio™ S5 Food Protection Instrument on a level surface. The installation location must be away from any vents that could expel particulate material on the system components.

## Thermal specifications for the instrument

During operation, the thermal outputs based on the typical current draw of the components are:

Component	Typical draw (W)	Thermal output (BTU/h)
Ion GeneStudio™ S5 Food Protection Instrument	520 <sup>[1]</sup>	1,774
Ion GeneStudio™ S5 Plus Food Protection Instrument	700 <sup>[1]</sup>	2,388
Ion GeneStudio™ S5 Prime Food Protection Instrument	700 <sup>[1]</sup>	2,388
Ion Torrent™ Server	1,100	3,753
Ion Chef™ Food Protection Instrument	990	3,378

<sup>[1]</sup> Maximum draw: 1,350W

### Ventilation requirements

Ion GeneStudio™ S5 Food Protection Instrument: Allow at least 12 inches of clearance around the instrument for ventilation.

Ion Chef™ Food Protection Instrument: Allow at least 4 inches of clearance at the sides and back, 14 inches of clearance at the top, and 6.7 inches of clearance at the front of the instrument for ventilation.

Do not block air inlets or outlets to allow proper ventilation.

### Cleaning or decontamination

See the user documentation for your Ion GeneStudio™ S5 Food Protection Instrument for information on how to clean or decontaminate the instrument.

Wear appropriate protection, including gloves, laboratory goggles, and coat whenever you work with the fluids that are used on this instrument, or parts that may come into contact with these fluids.

Use only the cleaning agents as described in the user documentation for your Ion GeneStudio™ S5 Food Protection Instrument. Use of cleaning agents that are not described in user documentation can impair the instrument. Contact Technical Support if you have questions.

Wipe off any liquid on or near the instrument using a lint-free tissue.

## Disposing of waste



**WARNING! CHEMICAL HAZARD.** Refer to Safety Data Sheets (SDSs) and local regulations for handling and disposing of plastic consumables. Follow local municipal waste ordinances for proper disposal provisions to reduce the environmental impact of plastic consumables.



**WARNING! DANGER CHIMIQUE.** Consulter les fiches de données de sécurité (FDS) et les réglementations locales en matière de manipulation et d'élimination des consommables en plastique. Se conformer à la réglementation locale relative à l'élimination des déchets usuels pour réduire l'impact environnemental des consommables en plastique.



**WARNING! CHEMICAL HAZARD.** Before handling chemicals, refer to the Safety Data Sheet (SDS) provided by the manufacturer, and observe all relevant precautions.



**WARNING! DANGER CHIMIQUE.** Avant de manipuler des produits chimiques, se référer à la fiche de données de sécurité (FDS) fournie par le fabricant et respecter toutes les précautions d'usage.



**WARNING! CHEMICAL HAZARD.** All chemicals in the instrument, including liquid in the lines, are potentially hazardous. Always determine what chemicals have been used in the instrument before changing reagents or instrument components. Wear appropriate eyewear, protective clothing, and gloves when working on the instrument.



**WARNING! DANGER CHIMIQUE.** Tous les produits chimiques contenus dans l'instrument, notamment le liquide dans les lignes, sont potentiellement dangereux. Toujours déterminer les produits chimiques utilisés dans l'instrument avant le remplacement de réactifs ou de composants de l'instrument. Porter des gants, des vêtements de protection et des protections oculaires appropriés lors de toute intervention sur l'instrument.



**WARNING! CHEMICAL HAZARD.** Waste produced by instruments can be hazardous and can cause injury or illness.



**WARNING! DANGER CHIMIQUE** Les déchets produits par les instruments peuvent être dangereux et entraîner des blessures ou des maladies.

## Electrical requirements



**WARNING!** For safety, the power outlet used for powering the instrument must be accessible at all times. See “Instrument clearances” on page 7 for information about the space needed between the wall and the instrument. In case of emergency, you must be able to immediately disconnect the main power supply to all the equipment. Allow adequate space between the wall and the equipment so that the power cords can be disconnected in case of emergency.



**WARNING!** Par souci de sécurité, la prise de courant alimentant l’instrument doit être accessible à tout moment. En cas d’urgence, il doit être possible de débrancher immédiatement l’alimentation principale de l’ensemble des équipements. Laisser suffisamment d’espace entre le mur et les équipements afin de pouvoir débrancher les câbles d’alimentation sans encombre, en cas d’urgence.

- Electric receptacle required: 2-prong with ground pin
- Mains AC line voltage tolerances must be up to  $\pm 10\%$  percent of nominal voltage

Component	Input voltage (VAC)	Frequency (Hz)	Rated current (A) <sup>[1]</sup>
Ion GeneStudio™ S5 Food Protection Instrument	100–240	50/60	14.0
Ion GeneStudio™ S5 Plus Food Protection Instrument	100–240	50/60	14.0
Ion GeneStudio™ S5 Prime Food Protection Instrument	100–240	50/60	14.0
Ion Torrent™ Server <sup>[2]</sup>	90–265	50/60	12
Ion Chef™ Food Protection Instrument	100–240	50/60	12

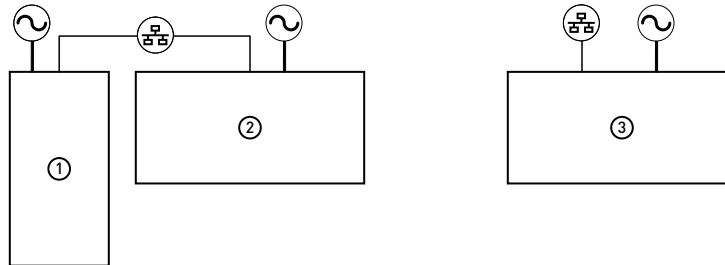
<sup>[1]</sup> Based on rated current at minimum input voltage.

<sup>[2]</sup> Minimum Efficiency: 65% (Energy Star Qualified); 85% Efficient Power Supply.



### Electrical requirements for the instrument

Use an approved UL Listed detachable power supply cord to connect the instrument to the wall. Route power cords away from the workspace to avoid accidental disconnection.



- ① Ion Torrent™ Server
- ② Ion GeneStudio™ S5 Prime Food Protection Instrument
- ③ Ion GeneStudio™ S5 Food Protection Instrument/Ion GeneStudio™ S5 Plus Food Protection System



Power cords are provided with the instruments. If not suitable for installation in your region, ensure that any power cord that you use is:

- Maximum 10 ft (3 m) in length
- Grounding type
- Compatible with the power supply receptacles used to connect to main power
- Suitable for the rating of the instrument and mains power supply
- Compliant with local safety requirements (for example, UL Listed for North America, JIS approved for Japan, HAR or agency certified for Europe)

### Electrical protective devices

We recommend several protective devices to protect the system in environments with large voltage and power fluctuations.

Device	Description
Power line regulator	<p>We recommend the use of a 1.5-kVA power line regulator in areas where the supplied power fluctuates in excess of <math>\pm 10\%</math> of the normal voltage. Power fluctuations can adversely affect the function of the instrument and computer.</p> <p><b>Note:</b> A power line regulator monitors the input current and adjusts the power supplied to the instrument or computer. It does not protect against a power surge or failure.</p>

Device	Description
Uninterruptible power supply (UPS)	<p>We recommend the use of a 1.5-kVA uninterruptible power supply (UPS), especially in areas prone to power failure. Power failures and other events that abruptly terminate the function of the instrument and computer can corrupt data and possibly damage the system.</p> <p> <b>WARNING! PHYSICAL INJURY HAZARD.</b> Do not attempt to lift the UPS unit without assistance of at least two people. Improper lifting can cause painful and permanent back injury. Refer to the UPS manufacturer user guide for more information.</p> <p> <b>WARNING! RISQUE DE BLESSURES CORPORELLES.</b> Ne pas essayer de soulever l'onduleur sans l'aide d'au moins deux personnes. En soulevant incorrectement l'appareil, l'opérateur risque de se blesser au dos de façon permanente. Voir le guide de l'utilisateur du fabricant de l'onduleur pour plus d'informations.</p> <p><b>IMPORTANT!</b> UPSs provide power for a limited time. They are meant to delay the effects of a power outage, not to serve as replacement power sources. In the event of a power loss, power off the instrument and computer unless you expect to regain power within the battery life of the UPS.</p>
Surge protector	<p>We recommend the use of a 10-kVA surge protector (line conditioner) in areas with frequent electrical storms or near devices that are electrically noisy, such as refrigerators, air conditioners, or centrifuges. Short-duration, high-voltage power fluctuations can abruptly terminate the function of, and thereby damage the components of, the computer and the instrument.</p> <p><b>Note:</b> A dedicated line and ground between the instrument, computer, and the building's main electrical service can also prevent problems caused by power fluctuations.</p>

## Network requirements

The Ion Torrent™ Server is factory-configured for the TCP/IP protocol. The product includes a fast Ethernet adapter (10/100 Mbps) with an RJ45-type connector and one 3-m (9.8-ft) crossover Ethernet cable that connects the computer and the instrument.

For the instrument to be connected to a LAN, an active, tested LAN connection must be in place before the scheduled installation date.

You must supply a standard Category 6 Ethernet cable of the required length to connect the computer to your LAN.

## Network configuration

**Note:** The Ion GeneStudio™ S5 Food Protection Instrument requires an efficient Internet connection to download software updates. If it is isolated from the Internet, you must download and install updates manually to the server.

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**IMPORTANT!** Manually installing server updates is not supported by Thermo Fisher Scientific. If you choose to download the updates to a USB and manually update the server, you do so at your own risk. Any issues updating the server in this manner requiring Thermo Fisher Scientific intervention are not covered by the warranty or any service contract you may have purchased. You will need to schedule an on-site visit by your field service engineer at your own expense.

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- The Ion GeneStudio™ S5 Food Protection Instrument requires outbound Internet access through HTTPS/port-443 and SSH/port-22 to allow us to provide remote support via the Axeda™ Remote System Monitoring (RSM) Agent. The server includes the Axeda™ Agent to assist you in maintaining your Ion GeneStudio™ S5 Food Protection System and to provide timely technical support (for more information, see <http://www.axeda.com/community/customers/applied-biosystems>).

At minimum, whitelist the following outbound addresses for the server:

- drm.appliedbiosystems.com on HTTPS (443)
- rssh.iontorrent.com on SSH (22)

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**IMPORTANT!** Without access through HTTPS/port-443 and SSH/port-22, we cannot support your site in a timely fashion and we may forego remote support for your site altogether at our discretion.

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- If the Ion GeneStudio™ S5 Food Protection System will be installed without a connection to a local area network, then you must provide a router to access data generated by the Ion GeneStudio™ S5 Food Protection Instrument. Connection and configuration of the router is not the responsibility of the field service engineer.

## Safety requirements

### Safety practices

A safety representative from your facility must ensure that:

- Personnel establish and follow all applicable safety practices and policies to protect laboratory personnel from potential hazards.
- All applicable safety devices and equipment are available at all times.

## Required safety equipment

Your laboratory has specific safety practices and policies designed to protect laboratory personnel from potential hazards that are present. Follow all applicable safety-related procedures at all times.

The following safety equipment and protection from hazards must be available at the installation site:

- Protection from any sources of hazardous chemicals, radiation (for example, lasers, radioisotopes, radioactive wastes, and contaminated equipment), and potentially infectious biological material that may be present in the area where the service representative will work.
- Eyewash
- Safety shower
- Eye and hand protection
- Adequate ventilation, including vent line/fume hood, if applicable
- Biohazard waste container, if applicable
- First-aid equipment
- Spill cleanup equipment
- Applicable Safety Data Sheets (SDSs)

## Materials for installation and operation

### Installation checklist

See the *Ion GeneStudio™ S5 Food Protection System IT Checklist* (Pub. No. MAN0017970) for the materials required for instrument installation. The checklist specifies the materials that must be onsite before installation and subsequent training can take place.

### Installation kit

The Ion S5™ Installation Kit (Cat. No. A27215) is available to first-time owners of an Ion GeneStudio™ S5 Food Protection System and is shipped with the instrument. The kit contains the core reagents and controls that are used during the installation, training, and operation of the instrument.

Ion S5™ Installation Kit (Part No. A27215; Not available for separate purchase.)

Contents	Part No.	Quantity	Storage
Ion 540™ Chip Kit	A27765	4 pack	15°C to 30°C
Ion S5™ Sequencing Solutions	A27767	1	
Ion S5™ Sequencing Reagents	A27768	1	-30°C to -10°C
Ion 540™ Control Ion Spheres	A28195	1	
Ion 540™ Loading Reagents OT2	A27897	1	
Ion S5™ Cartridge Tool	A28308	2	15°C to 30°C
Ion Chef™ S5 Series Chip Balance	A29022	1	

## Operation materials

Additional supplies and consumables are necessary for routine operation. Contact a sales representative to order these additional supplies. Use only supplies as specified by Thermo Fisher Scientific.

## Materials for template and library preparation

For more information about Ion Torrent™ sequencing applications and materials and equipment required for library and template preparation, see the documentation at [thermofisher.com](http://thermofisher.com).

## Receive and inspect the shipment

1. Verify that the items shown on the shipping list are the items that were ordered at the time of purchase.
2. Carefully inspect the shipping containers. Report any damage to the shipping company and to your service representative. Record any damage or mishandling on the shipping documents.
3. Immediately unpack the reagents or installation kit box (boxed separately from the instrument components). Store the reagents at the temperatures specified on the product packaging or labels.

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**IMPORTANT!** Do not unpack shipping containers at this time. To protect yourself from liability for damage that occurred during shipping, inspect the shipping containers and report damage as described above.

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## Move the crated instrument to the installation site

1. Clear the installation site of all unnecessary materials.
2. If possible, move the crated instrument and other shipping containers to the installation site. Do not uncrate.



**CAUTION! PHYSICAL INJURY HAZARD.** Do not attempt to lift or move the instrument without the assistance of others, the use of appropriate moving equipment, and proper lifting techniques. Improper lifting can cause painful and permanent back injury. Depending on the weight, moving or lifting an instrument may require two or more people.

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**IMPORTANT!** Do not tip the crated instrument on end. Tipping may damage the instrument hardware and electronics.

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**Note:** After installation, retain the crate and instrument packaging in case you need to relocate the instrument.

## Related documentation and support

### Related documentation

Document	Pub. No.	Description
<i>Ion GeneStudio™ S5 Food Protection Instrument User Guide</i>	MAN0017965	Describes the Ion GeneStudio™ S5 Food Protection System hardware and software, and provides information on preparing, maintaining, and troubleshooting the system.
<i>Ion GeneStudio™ S5 Food Protection System IT Checklist</i>	MAN0017970	Describes the IT setup requirements to ensure a successful Ion GeneStudio™ S5 Food Protection System installation.
<i>Ion 510™ &amp; Ion 520™ &amp; Ion 530™ Food Protection Kit–Chef User Guide</i>	MAN0017967	Provides instructions for automated template preparation, chip loading, and sequencing for the Thermo Scientific™ Next Generation Sequencing Food Authenticity Workflow.

### Food Safety support

Website: [thermoscientific.com/foodmicro](http://thermoscientific.com/foodmicro) or [thermofisher.com/foodsafety](http://thermofisher.com/foodsafety)

Support email:

- Europe, Middle East, Africa: [microbiology.techsupport.uk@thermofisher.com](mailto:microbiology.techsupport.uk@thermofisher.com)
- North America: [microbiology@thermofisher.com](mailto:microbiology@thermofisher.com)

Phone: Visit [thermofisher.com/support](http://thermofisher.com/support), select the link for phone support, and select the appropriate country from the dropdown menu.



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For descriptions of symbols on product labels or product documents, go to [thermofisher.com/symbols-definition](https://www.thermofisher.com/symbols-definition).

The information in this guide is subject to change without notice.

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**Revision history:** Pub. No. MAN0017966

Revision	Date	Description
B.0	11 September 2019	Add support for Ion GeneStudio™ S5 Plus Food Protection Instrument and Ion GeneStudio™ S5 Prime Food Protection Instrument.
A.0	18 October 2018	New document.

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