

# Attune™ NxT Acoustic Focusing Cytometer

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This guide contains the information needed to prepare your site for installation of the Invitrogen™ Attune™ NxT Acoustic Focusing Cytometer.

- Site preparation workflow ..... 1
- Site preparation checklist ..... 2
- Customer responsibilities ..... 3
- Site requirements ..... 4
- Materials required for installation and operation ..... 9
- Receive and inspect the shipment ..... 9
- Move the crated instrument to the installation site ..... 11
- Related documentation and support ..... 11

## 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 system (page 9).
2. Move the crated instrument to the installation site (page 11).
3. Complete the site preparation checklist (page 2).
4. Before the installation date, ensure that:
  - The site preparation checklist is complete.
  - The purchase order is complete.

## Timeline and training

After the system is uncrated, installation of the Attune™ NxT Acoustic Focusing Cytometer takes approximately four hours. When the Attune™ NxT Acoustic Focusing Cytometer system reaches proper operating status, the Thermo Fisher Scientific service representative returns to perform installation tests.


During and/or after installation, the Thermo Fisher Scientific service representative reviews data and provides some basic operator training. For additional training and reference information, see the user documents provided with the instrument.

## Site preparation checklist

**IMPORTANT!** Complete, date, and initial all items in the 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 may be postponed.

✓	Date	Initials	Site preparation requirement	See page
<input type="checkbox"/>			Customer responsibilities have been reviewed and personnel assigned.	3
<input type="checkbox"/>			The installation site is identified and meets requirements:	
			<input type="checkbox"/> Space and clearance	4
			<input type="checkbox"/> Environmental	5
			<input type="checkbox"/> Electrical	6
			<input type="checkbox"/> Network	7
			<input type="checkbox"/> Safety	7
<input type="checkbox"/>			Antivirus software is available for installation on the computer provided with the instrument (optional).	8
<input type="checkbox"/>			All materials needed for installation and operation are available.	9
<input type="checkbox"/>			The system was received and inspected:	
			<input type="checkbox"/> All items on the shipping list are the same items ordered at the time of purchase.	9
			<input type="checkbox"/> Any damage to shipping containers was reported to _____.	9
			<input type="checkbox"/> Any damage or mishandling was recorded on the shipping documents.	9
			<input type="checkbox"/> The Attune™ Starter Kit was unpacked and stored as specified.	9
<input type="checkbox"/>			The installation site is cleared and ready for instrument installation.	11
<input type="checkbox"/>			The crated instrument and other shipping containers are moved to the installation site.	11

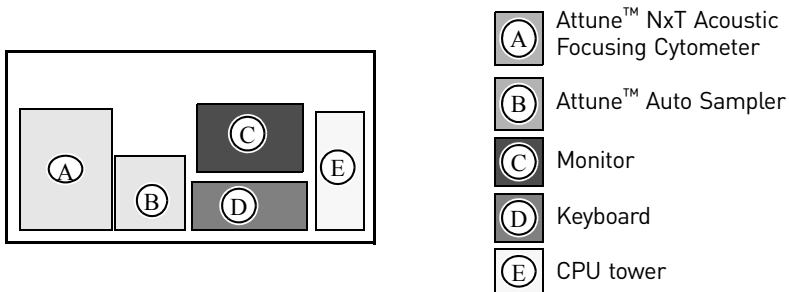
## Customer responsibilities

Personnel	Responsibilities
Site preparation/ installation coordinator	<ul style="list-style-type: none"> <li>• Reviews the site preparation guide for safety information and system requirements.</li> <li>• Coordinates personnel and tasks.</li> <li>• Orders required materials.</li> <li>• Chooses the site.</li> <li>• Reviews checklists with applicable personnel, then with the Thermo Fisher Scientific service representative to verify that the site is properly prepared.</li> <li>• Receives and inspects the system.</li> <li>• Stores the Attune™ Starter Kit.</li> <li>• Schedules the installation and informs personnel of the installation date.</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 Thermo Fisher Scientific service representative at all times while the service representative is at your facility.</li> </ul>
Laboratory personnel/ primary users	<ul style="list-style-type: none"> <li>• Review safety information.</li> <li>• Ensure that all customer-provided materials for installation are present at the site.</li> <li>• 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>• Ensure that 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, move the crated system to the site before the installation date.</li> <li>• Are available to assist service representative and laboratory personnel throughout installation.</li> <li>• If applicable, at least two people are available to help the Thermo Fisher Scientific service representative move and position the system.</li> </ul>
Network or IT specialist (if the system will be connected to a network)	<ul style="list-style-type: none"> <li>• Ensures that one active, tested local area network (LAN) connection is 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 system to the network.</li> </ul> <p> <b>CAUTION!</b> Do not attempt to connect the system components to the network before the Thermo Fisher Scientific service representative arrives. If applicable, provides and installs a network or dedicated printer.</p>

## Site requirements

**IMPORTANT!** We do not install, service, or repair Thermo Fisher Scientific instruments in areas designated BioSafety Level 3 (BSL-3) or BioSafety Level 4 (BSL-4).

A typical setup for an Attune™ NxT Acoustic Focusing Cytometer with the optional Attune™ Auto Sampler is shown below (*not to scale*). Note that the computer must be on the right side of the cytometer.



### Dimensions and weights

Ensure that the installation site (floor space and/or bench space) can accommodate the dimensions and support the weights.

Component	Width	Depth	Height	Weight
Attune™ NxT Acoustic Focusing Cytometer	58.1 cm (22.9 in.)	43.5 cm (17.1 in.)	40.0 cm (15.8 in.)	»27.3 kg (60 lbs)
(Optional) Attune™ Auto Sampler	29 cm (11.4 in.)	29 cm (11.4 in.)	40.0 cm (15.8 in.)	15.9 kg (35 lbs)
Computer	19.1 cm (7.5 in.)	43.2 cm (17.0 in.)	41.0 cm (16.1 in.)	11.5 kg (25 lbs)
Monitor	57.2 cm (22.5 in.)	20.3 cm (8.0 in.)	41.9 cm (16.5 in.)	6.5 kg (14 lbs)
Keyboard	45.7 cm (18 in.)	17.8 cm (7 in.)	5.1 cm (2 in.)	0.9 kg (2.0 lbs)

### Instrument clearances

During instrument setup and maintenance, it is necessary to access the back of the Attune™ NxT Acoustic Focusing Cytometer and the optional Attune™ Auto Sampler. If the back of the instrument faces a wall, it will be necessary to have enough space to rotate the instrument on the bench for access.

Bench	Minimum clearance
Depth	58.5 cm (23.1 in.) provides 43.2 cm (17.1 in.) for the cytometer unit, a 10.2 cm (4 in.) ledge in front of the cytometer unit to place fluid bottles being connected and disconnected, and 6.5 cm (2.5 in.) behind the cytometer unit for ventilation and for opening the hinged lid of the unit.
Width	~127 cm (50 in.) provides 58.2 cm (22.9 in.) for the cytometer unit, 9.5 cm (3.75 in.) on the left to open the fluid access door, and 57.2 cm (22.5 in.) on the right for the widescreen computer monitor. <b>IMPORTANT!</b> If the system includes the optional Attune™ Auto Sampler, then add 40 cm (15.8 in.) to the width of the bench, for a total bench width of ~ 167 cm (65.8 in.).
Height	74 cm (29 in.) allows the hinged lid to be placed in the vertical open position. This provides access to the optical compartment and allows changing of filters.

## Building clearances

Building clearances required for the passage of the instrument crate are:

Crate dimension	Minimum building clearance
Height	69.8 cm (27.5 in)
Length	76.2 cm (30.0 in)
Depth	63.5 cm (25.0 in)

## Environmental requirements

Condition	Requirement
Installation site	Indoor use only
Altitude	Safety tested up to 2000 m (6500 ft)
Humidity	Maximum relative humidity 80% for temperatures up to 31°C, decreasing linearly to 50% relative humidity at 40°C.
Temperature	15 to 30°C (50 to 95°F). Maximum change of less than 15°C (27°F) per 24 hrs. Avoid placing the system adjacent to heaters, cooling ducts, or in direct sunlight. Fluctuations between day and night temperatures can cause system instability.
Thermal Output	Hot-air exhaust is vented from the Attune™ NxT Acoustic Focusing Cytometer through the hot-air waste port on the rear panel. The hot-air exhaust is designed to dissipate heat produced by the instrument. The maximum thermal output of the Attune™ NxT Acoustic Focusing Cytometer is ~ 500 Btu/h (150 W). Consult your facilities department to determine if the laboratory ventilation system can maintain room temperature with this level of thermal output. If it can maintain room temperature during instrument operation, the hot-air exhaust port can be vented directly to room air.
Vibration	Do not place the Attune™ NxT Acoustic Focusing Cytometer on surfaces that are subject to constant or intermittent vibration. Tabletop centrifuges, vortex mixers and other laboratory equipment can vibrate the instrument during a run that can cause a decrease of instrument performance.
Pollution degree	2

## Electrical requirements



**WARNING!** For safety, the power outlet used for powering the sequencer must be accessible at all times. See “Instrument clearances” on page 4 for information about the space needed between the wall and the sequencer. 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.


	Cytometer Unit	Auto Sampler Unit	Dell Mini Tower	Dell Monitor
AC Voltage, Nominal	100-240 VAC	100-240 VAC	115 or 230 VAC	100-240 VAC
AC Voltage Limits	90-264 VAC	90-264 VAC	—	—
AC Frequency, Nominal	50 or 60 Hz	50 or 60 Hz	50 or 60 Hz	50 or 60 Hz
AC Frequency Limits	47-63 Hz	47-63 Hz	—	47-63 Hz
AC Phases	1	1	1	1
Typical Power	75 W	25 W	150 W	60 W
Maximum Power	150 W	30 W	300 W	100 W

The Attune™ NxT Acoustic Focusing Cytometer can be configured for operating voltages between 100 and 240 VAC at 50 or 60 Hz. The instrument is equipped with a universal power supply. The instrument requires a 15 A circuit for all indicated input voltages.

**IMPORTANT!** The Attune™ NxT Acoustic Focusing Cytometer and the optional Attune™ Auto Sampler are shipped to customers with up to three power connectors. These connectors require standard 15 A wall receptacles with proper grounding. Do not use extension cords.

## 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 +/- 10% 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>
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!</b> PHYSICAL INJURY HAZARD. Do not attempt to lift the UPS unit without assistance (minimum of two people). Improper lifting can cause painful and permanent back injury. Refer to the UPS manufacturer user guide for more information.</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>

Device	Description
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 computer is factory configured for the TCP/IP protocol, and includes a fast Ethernet adapter (10/100baseT) with an RJ45-type connector. Connect the Attune™ NxT Acoustic Focusing Cytometer to the computer using a USB 1.1 connector.

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**IMPORTANT!** Do not use the Attune™ NxT Acoustic Focusing Cytometer on a wireless network. A wireless network may interfere with data collection, resulting in data loss.

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## 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 protection and equipment 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 Thermo Fisher Scientific service representative will work.
- Appropriate fire extinguisher:
  - You are responsible for providing an appropriate fire extinguisher for use on or near Thermo Fisher Scientific equipment.
  - The types and sizes of fire extinguishers shall be suitable for use on electrical and chemical fires as specified in current codes, regulations, and/or standards, and with approval of the Fire Marshall or other authority having jurisdiction.
  - The installation of appropriate fire extinguishers shall be in addition to other fire-protection systems and not as a substitute or alternative to them.
- Eyewash
- Safety shower
- Eye and hand protection
- Adequate ventilation, including vent line/fume hood, if applicable

## Site requirements

### *Optional antivirus software and antispyware*

- Biohazard waste container, if applicable
- First-aid equipment
- Spill cleanup equipment
- Applicable Safety Data Sheets (SDSs)

### **Optional antivirus software and antispyware**

No antivirus software is provided because customer preferences and network requirements vary. You are responsible for installing antivirus software of your choice to protect the computer against viruses.

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**IMPORTANT!** You must disable or deactivate antivirus software and antispyware during use of the Attune™ NxT Acoustic Focusing Cytometer. Antivirus and antispyware monitoring can interfere with Attune™ NxT Acoustic Focusing Cytometer data collection, resulting in data loss.

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## Materials required for installation and operation

### Installation

- Safety glasses, lab coats, and chemical-resistant, disposable gloves (powder-free)
- Lint-free tissues
- Isopropanol, HPLC-grade or better
- 10% bleach solution
- Water, Milli-Q™ grade
- Three sizes of micropipettors and tips:
  - 1- to 10- $\mu$ L
  - 10- to 100- $\mu$ L
  - 100- to 1000- $\mu$ L
- Mini vortexer, centrifuge equipped to accept 15 and 50 mL centrifuge tubes, and sample tubes

### Operation

Additional supplies and consumables are necessary for routine operation of the Attune™ NxT Acoustic Focusing Cytometer. Contact the Thermo Fisher Scientific sales representative to order these additional supplies. Use only supplies as specified by Thermo Fisher Scientific.

## Receive and inspect the shipment

1. Verify that the items shown on the shipping list are the same items that you ordered at the time of purchase.
2. Carefully inspect the shipping containers and report any damage to the Thermo Fisher Scientific service representative. Record any damage or mishandling on the shipping documents.
3. Immediately unpack the Attune™ Starter Kit (boxed separately from the instrument components). Store the components as specified.

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**IMPORTANT!** Except for the Attune™ Starter Kit, do not unpack Attune™ NxT Acoustic Focusing Cytometer shipping containers, to protect you from liability if any damage occurred during shipping.

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**WARNING! CHEMICAL HAZARD.** Some chemicals used with Thermo Fisher Scientific instruments are potentially hazardous and can cause injury, illness, or death. Read and understand the Safety Data Sheets (SDSs) provided by the chemical manufacturer before you store, handle, work with, or dispose of any chemicals or hazardous materials

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## Shipped contents

- Attune™ NxT Acoustic Focusing Cytometer(s)
- (Optional) Attune™ Auto Sampler
- Computer tower, monitor, keyboard, and mouse
- Accessories
- Attune™ Starter Kit:
  - Software Kit (includes a valid DESkey device, which is required for the operation of the Attune™ NxT Software)
  - Starter Kit
  - Reagents:

Reagent	Cat. no.	Storage Conditions	Usage Conditions	Stability
Attune™ Focusing Fluids, 1X solution, 6 x 1 L	4449791	15 to 30°C	15 to 30°C	The focusing fluids are stable on the instrument for 30 days after the bottle has been opened.
Attune™ Wash Solution	A24974	15 to 30°C		The wash solution is stable on the instrument for 30 days after the bottle has been opened.
Attune™ 1X Shutdown Solution	A24975	15 to 30°C		The shutdown solution is stable on the instrument for 30 days after the bottle has been opened and dilute to 1X.
Attune™ Performance Tracking Beads (5 x 10 <sup>6</sup> beads/mL)	4449754	2 to 8°C		The beads are stable for 1 year, when stored as directed.

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**IMPORTANT!** Reagents may be stored at colder temperatures, but ensure that all reagent temperatures are 15 to 30°C before running the instrument.

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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 persons



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

## Related documentation and support

The publication numbers in this section are for the latest product versions available at the time of publication. For documentation for newer product versions, go to [www.thermofisher.com/support](http://www.thermofisher.com/support).

Document	Pub. no.
Attune™ NxT Acoustic Focusing Cytometer Quick Reference Card	100024233
Attune™ NxT Acoustic Focusing Cytometer Software User Guide	100024236
Attune™ NxT Acoustic Focusing Cytometer Hardware User Guide	100024235
Attune™ NxT Acoustic Focusing Cytometer Maintenance and Troubleshooting Guide	100024234

### Obtain SDSs

Safety Data Sheets (SDSs) are available from [www.thermofisher.com/support](http://www.thermofisher.com/support).

**Note:** For the SDSs of chemicals not distributed by Thermo Fisher Scientific, contact the chemical manufacturer.

## Obtain support

For the latest services and support information for all locations, go to:

**[www.thermofisher.com/support](http://www.thermofisher.com/support)**

At the website, you can:

- Access worldwide telephone and fax numbers to contact Technical Support and Sales facilities
- Search through frequently asked questions (FAQs)
- Submit a question directly to Technical Support
- Search for user documents, SDSs, vector maps and sequences, application notes, formulations, handbooks, certificates of analysis, citations, and other product support documents
- Obtain information about customer training
- Download software updates and patches

## Limited product warranty

Life Technologies Corporation and/or its affiliate(s) warrant their products as set forth in the Life Technologies' General Terms and Conditions of Sale found on Life Technologies' website at **[www.lifetechnologies.com/termsandconditions](http://www.lifetechnologies.com/termsandconditions)**. If you have any questions, please contact Life Technologies at **[www.lifetechnologies.com/support](http://www.lifetechnologies.com/support)**.

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