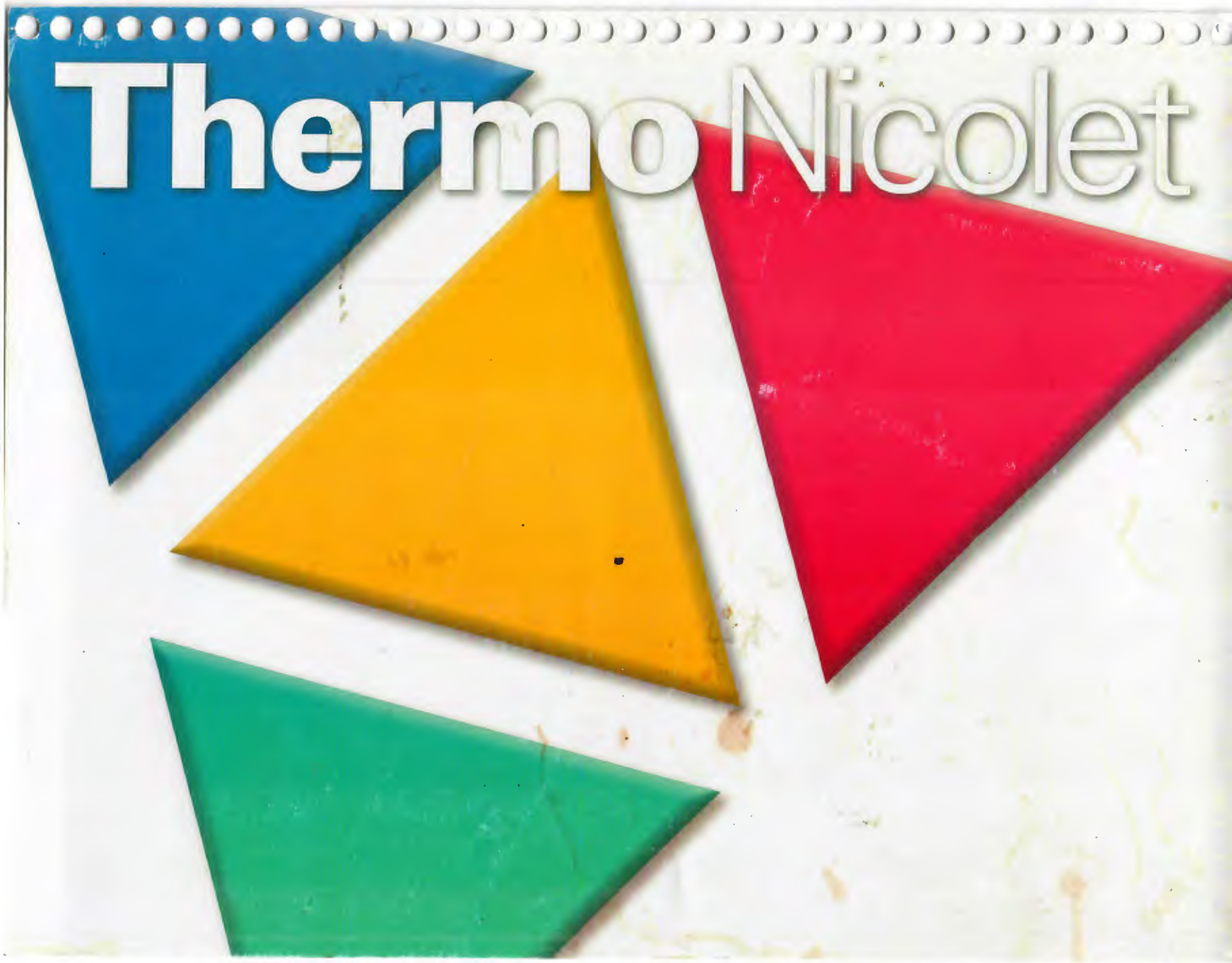

Thermo Nicolet

AVATAR

Preparing Your Site

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269-088603

Contents

Introduction

Thermo Nicolet's Avatar™ spectrometers are designed to be extremely durable and reliable. They will work under adverse conditions for extended periods; however, to best ensure accurate results on a repeatable basis, you should maintain a stable working environment.

Before installation, please read this manual and consider its points for your system work space. Four major areas are covered in this manual:

Location — Consult the dimensional drawings of the spectrometer and accessories when planning the location of your system. Leave extra space around the system for clearance and service access.

Environmental considerations — Avoid excessive static electricity, temperatures, vibration, intense magnetic fields, and humidity.

Utility requirements — Before the system arrives, it is important to install any necessary utilities in the planned work space. You will need electrical power. You may also need a telephone line, a source of dry air or nitrogen and a supply of liquid nitrogen.

Accessories — If you ordered any accessory modules, consult the appropriate dimensional drawings to help plan the location of your system. Other preinstallation concerns are included.

If you suspect that you cannot meet these optimal conditions, or have other concerns, contact Thermo Nicolet Customer Support for assistance. In the U.S.A., call 1-800-642-6538 or 1-608-276-6373. Outside the U.S.A., contact your local Thermo Nicolet office.

Telephone numbers for all Thermo Nicolet service offices are provided on the card that came in this kit.

Location

Consider these points when planning the location of your system:

- If possible, choose a site easily accessible by Thermo Nicolet personnel and have a telephone near the system. Should the system require technical support, optional *R.S.V.P.* remote diagnostic support, or service, these measures will save time.

- An electrical power source must be nearby. The Avatar spectrometer has a 2.5 m (8 feet) long power cord.

- The floor (and table or counter used for a work surface) should be rigid to avoid vibration. Keep the spectrometer away from air conditioners, refrigeration units and other machinery that may vibrate the floor. While vibration will not damage the spectrometer, it can compromise spectral quality.

- Make sure the spectrometer and any accessories will fit in the work space you choose. Compare the work space with the dimensions shown in the next section and in the "Utility Requirements" and "Accessory Modules" chapters.

  - Access covers must be able to open for maintenance and service. Leave at least 45 cm (18 in) of clearance above the spectrometer to allow the sample compartment cover to be opened fully. (Some accessories may require more clearance.)

  - If possible, leave at least 30 cm (12 in) of clearance behind the spectrometer and any accessory modules to allow service access.

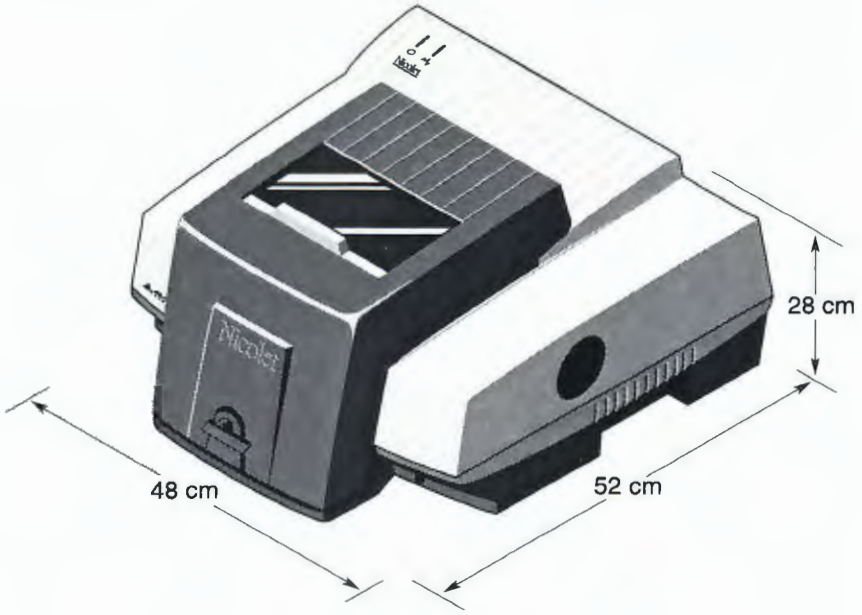
  - If you use more than one table to support the spectrometer and any accessory modules, the table tops must be the same height; otherwise, the external beam port will not align.

- Choose a table height that allows you to work comfortably with the spectrometer. If you will be using a Thermo Nicolet microscope accessory, keep in mind that the eyepiece will be 48 to 53 cm (19 to 21 in) above the table top.

- There are air vents on the back of the spectrometer. *Do not* block the vents.

System dimensions and weight

Avatar spectrometers weigh about 22.5 kg (60 lb). They are approximately 52 cm (20.5 in) deep by 48 cm (18.5 in) long by 28 cm (11 in) high.

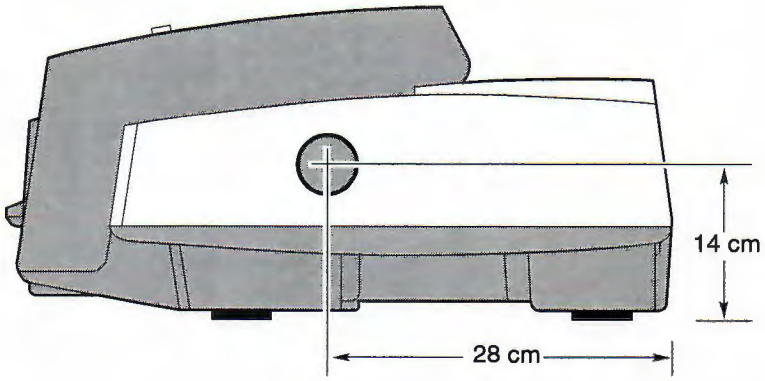


Avatar 360 dimensions

External beam port

The following illustration shows the location of the external beam port on the right side of an Avatar spectrometer. See the on-line *Spectrometer Tour* that you will receive with the spectrometer for complete information about using this port.

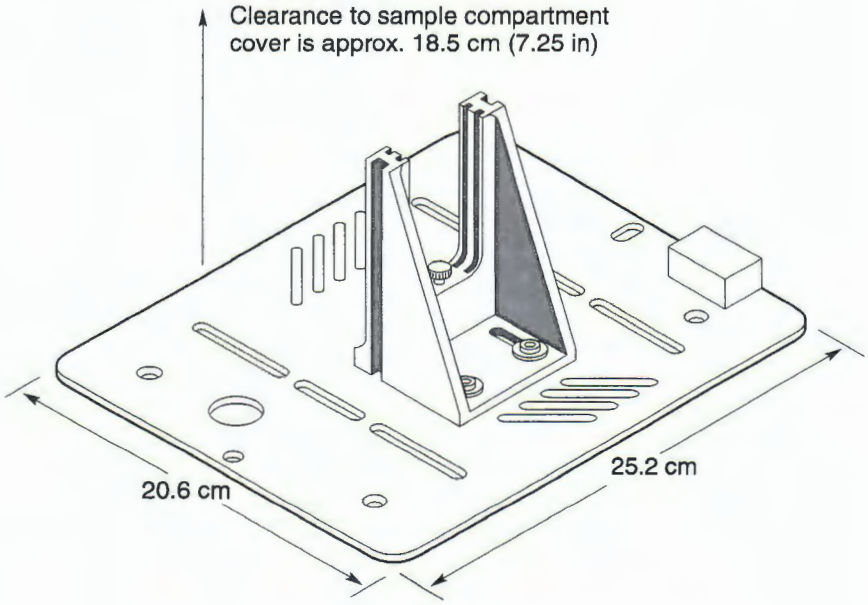
Note The optional automated external beam mirror is required if you wish to use the external beam port to create a beam path to a microscope or other accessory. ▲



External beam port on right side of an Avatar spectrometer

Sample compartment baseplate dimensions

The following illustration shows the dimensions of the sample compartment baseplate. See the on-line *Spectrometer Tour* and *Replacing Parts* tutorials that you will receive with your spectrometer for complete information about installing and using Snap-In™ baseplates.

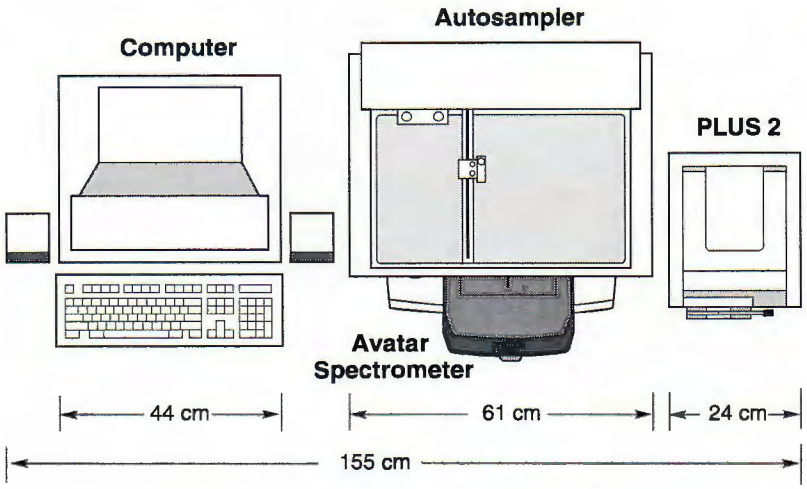


Sample compartment baseplate dimensions

The infrared beam is focused in the center of the sample compartment, 8.9 cm (3.5 in) above the top surface of the baseplate. The beam diameter is 7 mm at the focus.

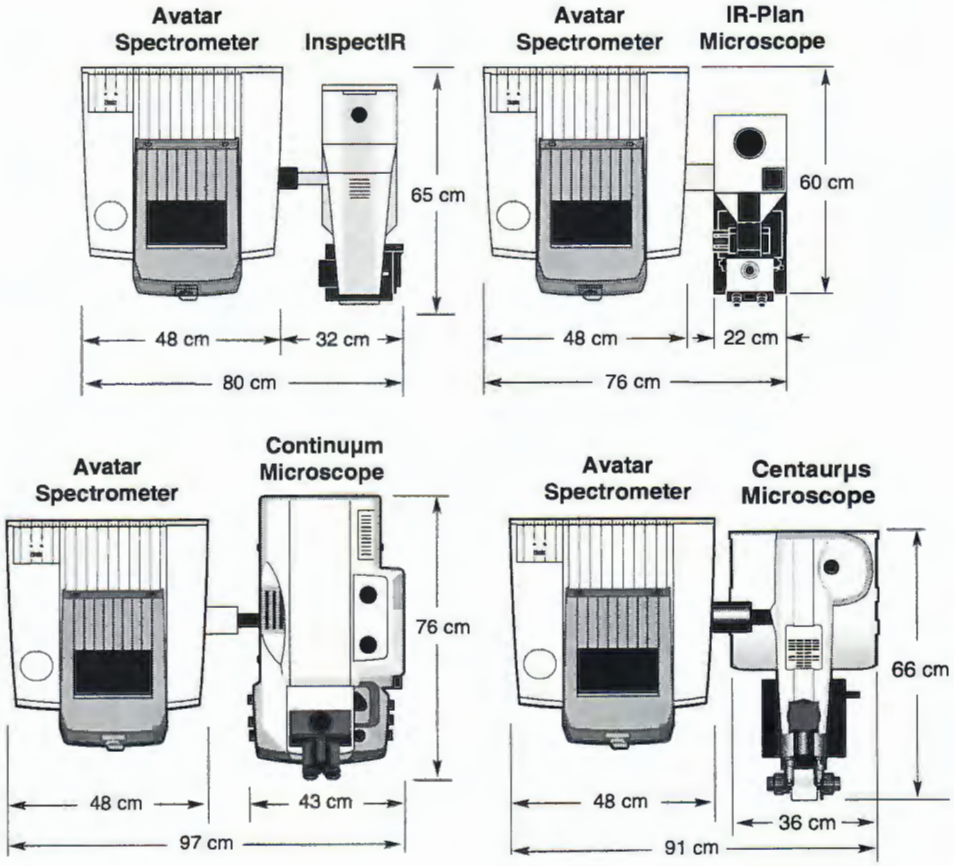
Overall system dimensions and required clearances

If you purchased a microscope or other accessory that uses the external beam port (not available for the Avatar 360N model), use the dimensions shown below to plan your work space. A standard table depth of 76 cm (30 in) will accommodate the spectrometer and any combination of accessories.



Top views

If your Avatar spectrometer is attached to a Continuµm, Centaurµs, InspectIR, or IR-Plan microscope, use the drawing below to plan your work space.



Top views

There must at least 45 cm (18 in) of clearance above the spectrometer so that the sample compartment cover can be fully opened and to allow access to internal parts during servicing.

Clearance needed above spectrometer

Environmental Considerations

Environmental considerations include temperature, vibration, magnetic fields, humidity and static electricity.

Temperature

Maintain the temperature in the work space between 16° and 27°C (60° and 80°F). For better long-term stability, keep the temperature between 20° and 22°C (68° and 72°F). Temperature changes may result in long-term drift in the system response.

Once the spectrometer has been installed, plan to leave it turned on. The internal temperature and stability of the spectrometer will change significantly if it is switched on and off daily. Long-term stability improves with the length of time the spectrometer has been on.

Avoid placing the system near air conditioning ducts or large windows. Even if the windows have curtains, there is still significant heat loss through the glass at night.

Keep sources of heat, such as hot plates and heating mantles, away from the instrument. Do not place the spectrometer near heating or air conditioning vents.

Vibration

Floor vibration or acoustical noise from heavy manufacturing equipment or other sources can affect the performance of your spectrometer. Minimize or eliminate noise and vibration wherever possible. If vibration is a problem in your work space, consider placing the spectrometer on a marble-top table or counter or obtaining a vibration isolation system.

Magnetic fields

Intense magnetic fields, such as those produced by superconducting magnets, can affect spectrometer performance. The spectrometer should be at least 5.5 meters (18 feet) away from these fields. Minimize or eliminate exposure to magnetic fields wherever possible.

Humidity

Internal windows for mid-IR Avatar systems have a special coating that protects them from humidity damage. However, you should be aware that the infrared detector windows are hygroscopic and become irreversibly opaque when exposed to moisture. Also, the beamsplitter (inside the interferometer) and other components inside the mid-IR spectrometer models may corrode with exposure to moisture.

Avatar spectrometers are sealed and desiccated. This provides a moderate level of protection against environmental humidity. However, in environments with high humidity, we recommend that you:

- Purge the system with dry air or nitrogen. (We provide instructions for optional purge later in this manual.)
- Maintain the humidity in the range of 20% to 80% noncondensing.
- Avoid rapid changes in temperature that may cause condensation.

▲ Caution Whenever the spectrometer, a detector, or accessory has been stored or shipped, immediate exposure to room air can cause condensation damage. *Allow 24 hours for the package to slowly warm to room temperature before opening it.*

If you are moving the system between sampling sites, protect the instrument from extreme changes in temperature and humidity by resealing it in the protective packaging that the instrument was originally shipped in. Extreme changes in temperature and humidity may cause moisture condensation, which can permanently damage the optical components. ▲

Static electricity

Since static electricity can destroy electronic components, your spectrometer was specially designed to meet the international standard: IEC 801-2; electrostatic discharge immunity requirements for industrial process, measurement and control equipment. If you have trouble with static electricity in your laboratory, you can further protect your spectrometer (especially when you are servicing or handling components inside the spectrometer) by following these guidelines:

- Maintain the humidity in the range of 20% to 80% noncondensing.
- Use conducting carpet in the work space.
- Place antistatic mats over conventional carpet.
- Avoid plastic chairs that may build up large static potentials.
- Wear natural fiber clothing.
- Use a grounding strap.

Ventilation

There are no special ventilation requirements for an Avatar spectrometer. The types of analysis you plan may require special ventilation (for example, if you will be analyzing highly toxic samples or dissolving your samples in solvents that interact with infrared sources). Chlorinated solvents, perfluorochlorinated solvents, and other solvents containing halogenated hydrocarbons are often used as FT-IR solvents. The pyrolysis of these solvents by an infrared source may produce hydrochloric acid (HCl), hydrofluoric acid (HF), or phosgene ($COCl_2$).

Hydrochloric acid and hydrofluoric acid are highly corrosive and may cause accelerated corrosion of the metallic components in the spectrometer if the seal on the optical compartment is not properly maintained or the concentration level of corrosive gasses in the air is excessively high due to improper sampling techniques.

⚠ Warning Hydrochloric acid, hydrofluoric acid and phosgene are highly toxic. If you plan to regularly use solvents containing halogenated hydrocarbons, be sure your work area is properly ventilated. ▲

Be sure to provide storage space for solvents containing halogenated hydrocarbons that is away from the spectrometer; they should not be left in the sample compartment for an extended time. If measurements require the sample compartment cover to be closed, the sample compartment must be purged while the solvents are used. An optional purge kit is available from Thermo Nicolet.

Utility Requirements

If possible, the power connections for the spectrometer and accessories should be easily accessible for service purposes. The line for dry air or nitrogen, which is used to purge the system, should also be accessible if service is required.

You should have direct control over the system utilities.

Note It is important to have all system utilities installed before the spectrometer arrives. Utility installations must comply with local building and safety codes. ▲

Electrical requirements

Power supplied to the system should be from dedicated, uninterrupted sources. Power must be free of voltage dropouts, transient spikes, frequency shifts and other line disturbances that impair reliable performance. Each wall outlet you use must be equipped with a 3-wire line: live, neutral and ground. If you suspect power quality problems at your site, or if your system will be installed in a heavy industrial environment, we recommend a power quality audit before installation. Contact Thermo Nicolet or your local electrical authority for more information.

⚠ Danger To assure a good ground connection and avoid shock hazard, do not use an outlet that is connected to a conduit ground. The ground must be a non-current carrying wire connected to earth ground at the main distribution box. ▲

Note Many of the larger accessories offered with some Avatar models, such as liquid analysis systems and microscopes, require their own power connections. ▲

Your spectrometer was specially designed to meet the international standard: IEC 801-4; electrical fast transient burst immunity requirements for industrial process, measurement and control equipment.

Power line conditioning accessories

Uninterruptable power supplies (UPS) are available from Thermo Nicolet. A UPS reduces the odds of a system shutdown if power is lost elsewhere in the building. Power line conditioners (which ensure that your service is free from sags, surges or other line disturbances) also are available in the U.S.A. from Thermo Nicolet for 120-volt operation. Line conditioners for 220-volt operation can be purchased locally. Contact Thermo Nicolet Customer Support for information about power conditioners and UPS.

Electrical service specifications

The following table lists the specifications for electrical service. Contact your local Thermo Nicolet service representative if you have questions about the requirements. If you are not sure that your power lines meet these requirements, contact Thermo Nicolet Customer Support for information about power audits.

Requirement	*Specification*
AC input	100 to 240 VAC
line frequency	50-60 Hz
current	15 A (120-volt operation) 7.5 A (220-volt operation)
line disturbances	Sags, surges or other line disturbances must not exceed 10% of input voltage (even for a half cycle).
noise	less than 2 volts (common mode) less than 20 volts (normal mode)

Power consumption

Generally, 50% more power should be available than the entire system (including accessories) typically uses. Maximum power consumption and heat dissipation specifications for the spectrometer and accessories are shown below. The values are approximate.

Item	*Power Consumption*	*Max. Heat Dissipation*
Avatar spectrometer	50 W	171 Btu/hr
standard computer and monitor*	460 W	1,570 Btu/hr
Whatman purge gas generator	10 W	34 Btu/hr
Whatman pure air dryer	1,000 W	3,414 Btu/hr
Continuµm microscope	250 W	854 Btu/hr
Centaurµs microscope	65 W	222 Btu/hr
autosampler**	40 W	137 Btu/hr
PLUS™ 2 pump**	345 W	1178 Btu/hr
PLUS 2 power supply/valve module**	74 W	253 Btu/hr
standard printer*	200 W	683 Btu/hr

* Values shown are estimates. See the power specifications on the rear panels or undersides of these units.

** Used with the Liquid Analysis System.

Telephone

If possible, install a telephone with an outside line near the spectrometer. Should you require assistance from Thermo Nicolet, a telephone in the lab will save time.

If your system has the RSVP™ Remote Diagnostics Package, install a separate analog phone line for the modem. The line must be capable of accepting incoming calls.

Note We recommend that you dedicate a phone line for data modem calls. If you require assistance, a Thermo Nicolet service engineer can discuss the problem with you through the voice line while running diagnostic tests on your system through the modem line. ▲

Modem line specifications

The data modem requires an analog phone line (an outside line in most businesses). Many private branch exchange (PBX) phone systems use digital phone lines that will not work with your data modem. Ask your PBX administrator for a direct, outside line or a sampled analog trunk line that allows incoming calls from an outside source.

Use the following guidelines to determine whether or not you have an analog phone line.

Rotary phone — All rotary phones are analog phones. If you hear a dial tone when you plug a rotary phone into the phone wall jack, you have an analog phone line and your data modem will work.

Push-button phone — If you have a push-button phone, check the bottom of the phone to see whether it has a ringer equivalence number (REN) or a load number (LN). All analog phones have an REN or an LN. If you hear a dial tone when you plug a push-button phone that has an REN or an LN into the wall jack, you have an analog phone line and your data modem will work.

Wall jack specifications

In the U.S.A., install an RJ-11 jack; in Canada, install a CA11A jack. For other locations, contact your local Thermo Nicolet office for jack requirements.

Purge gas

Avatar spectrometers are sealed and desiccated. The spectrometer does, however, contain precise optical components that may be damaged by a moist environment. To protect those components, we recommend that you obtain an optional purge kit if you have difficulty controlling humidity in your laboratory environment.

▲ Caution Optical damage caused by failure to purge the spectrometer is not covered under your Thermo Nicolet warranty. ▲

You may also have a laboratory environment that is contaminated with solvents or other agents that can corrode spectrometer components. Purging the spectrometer (forcing dried air or nitrogen through the spectrometer to eliminate water vapor, carbon dioxide and other airborne contaminants) will better protect the components. Although all Avatar spectrometers are sealed and desiccated, we recommend that you install a source of dry air or nitrogen to purge the spectrometer of water vapor, carbon dioxide and volatile solvents.

▲ Caution Do not use Argon as a purge gas. Argon is a good insulator and prevents the laser from cooling properly. This significantly shortens the life of the laser and can also cause the source to overheat. ▲

▲ Caution The interaction of chlorinated solvents, perfluorochlorinated solvents or other solvents containing halogenated hydrocarbons (for example, Freon®) with an IR source can corrode spectrometer components. Do not leave these solvents exposed around the spectrometer any longer than necessary. ▲

Purging the spectrometer can also ensure more accurate results. This is particularly true when you collect data for sample components that are also present in your laboratory environment.

Note If you ordered a microscope, you might need more than one purge line. Contact Thermo Nicolet Customer Support for more information. ▲

Selecting a purge gas

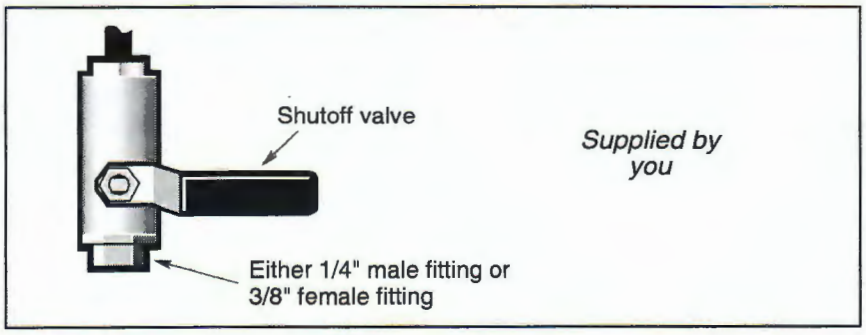
Dry air and nitrogen are equally effective in eliminating water vapor and volatile solvents, but nitrogen is more effective against carbon dioxide. The purge gas must be free of moisture, oil and other reactive materials. To remove particulate matter and oil, you may need to install a 10-micron filter. Dry air or nitrogen supplied for purge should be dried to a dew point of -70°C (-94°F) or below for best performance.

▲ Caution Do not use Argon as a purge gas. Argon is a good insulator and prevents the laser from cooling properly. This significantly shortens the life of the laser and can also cause the source to overheat. ▲

⚠ Warning *Never* use a flammable, combustible or toxic gas to purge the spectrometer. ▲

Installing purge gas fittings

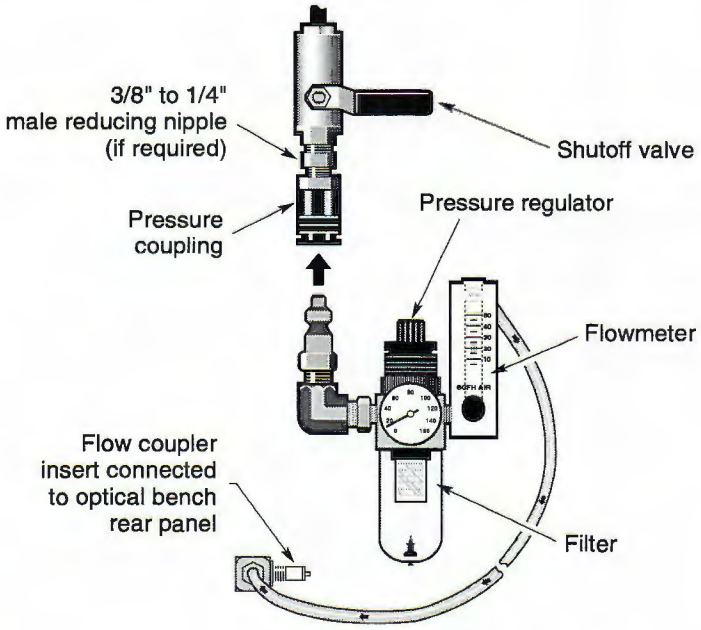
If you plan to purge the spectrometer, install the purge line and the necessary fittings *before* the spectrometer arrives (see the illustration below). The source line pressure should be at least 20 psig and must not exceed 100 psig.



A pressure regulator and flowmeter will be installed by Thermo Nicolet to maintain a line pressure of 10 to 20 psig at the flowmeter inlet and a flow rate of 15 scfh for optimal data collection.

Install the source line within 10 feet of the proposed location for your spectrometer. The line must be installed vertically to ensure that the pressure gauge scale does not tilt when the gauge and regulator assembly are attached later. This prevents moisture from accumulating in the system.

Once the line is installed, attach a shutoff valve and either a 1/4-inch male fitting or a 3/8-inch female fitting. The pressure coupling will be attached to the 1/4-inch male fitting by Thermo Nicolet. If you used the 3/8-inch female fitting, the reducing nipple will be installed by Thermo Nicolet before the pressure coupling is attached. The illustration below shows how the equipment will be connected between the pressure coupling and the spectrometer.



Purge gas generators

If your facility does not have a source of clean, dry compressed air or nitrogen for system purge, we recommend that you consider using a purge gas generator. The generator cleans and dries the air supplied by your air compressor and provides it to the spectrometer. (For facilities without an air compressor, a complete dry-air generating system is available; see the next section.)

The spectrometer works well with the Whatman® (Balston®) purge gas generator models shown at the top of the following table, which lists part numbers and specifications. The generator supply voltage and frequency are not adjustable, so be sure to order the correct items for your local utility service. The power consumption of the generators is listed earlier in the section called "Power consumption."

Whatman Model Numbers:	*75-45*	*75-45EU*	*75-52*	*75-52EU*
Thermo Nicolet part number	869-050300	869-050400	869-050500	869-050600
nominal input line voltage	120 volts AC	240 volts AC	120 volts AC	240 volts AC
dew point	-73°C (-100°F)	-73°C (-100°F)	-73°C (-100°F)	-73°C (-100°F)
maximum dry (outlet) air flow rate for specified dew points*				
inlet pressure 8.50 atm (125 psig)	17 liters/min (36 scfh)	17 liters/min (36 scfh)	34 liters/min (72 scfh)	34 liters/min (72 scfh)
inlet pressure 4.08 atm (60 psig)	9 liters/min (18 scfh)	9 liters/min (18 scfh)	17 liters/min (36 scfh)	17 liters/min (36 scfh)
air consumption for regeneration**	14 liters/min (30 scfh)	14 liters/min (30 scfh)	28 liters/min (60 scfh)	28 liters/min (60 scfh)
minimum inlet air pressure	4.08 atm (60 psig)	4.08 atm (60 psig)	4.08 atm (60 psig)	4.08 atm (60 psig)
CO_2 concentration	< 1 ppm	< 1 ppm	< 1 ppm	< 1 ppm
maximum inlet air temp.***	25°C (78°F)	25°C (78°F)	25°C (78°F)	25°C (78°F)
inlet/outlet port size	1/4 inch NPT (female)	1/4 inch NPT (female)	1/4 inch NPT (female)	1/4 inch NPT (female)
shipping weight	11 kg (25 lb)	11 kg (25 lb)	18 kg (40 lb)	18 kg (40 lb)

* Dew point will be lower than specified at lower air flow.
** Total air required = air loss + process demand (up to maximum dry air flow rate).
*** Outlet dew point will increase at higher inlet compressed air temperatures.

Note Position the purge gas generator away from the spectrometer to reduce noise and vibration. ▲

▲ Caution Purge gas generators require a minimum pressure for proper operation. Failure to supply this pressure may allow moisture to enter the system, causing permanent damage. See the preceding table for the minimum pressure values. ▲

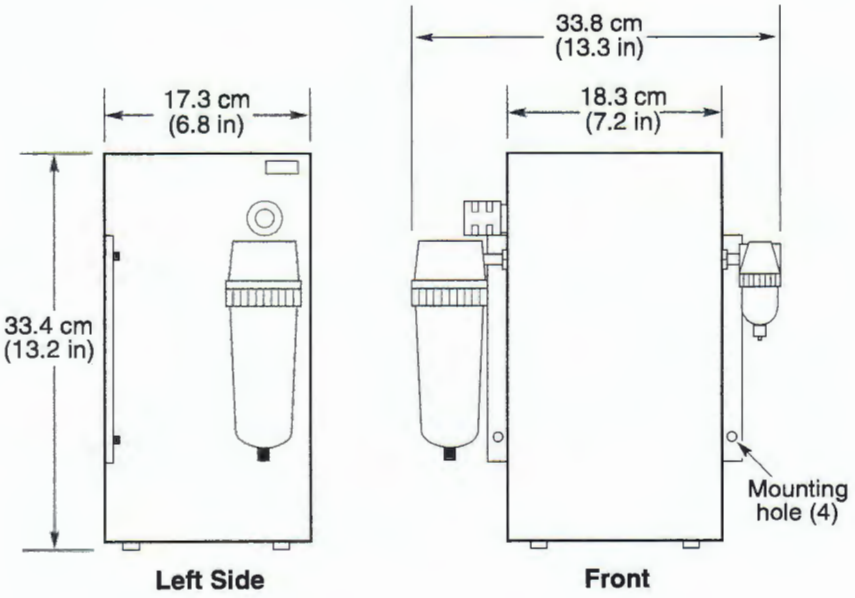
The following illustrations show the dimensions of the purge gas generators and the locations of holes that can be used for mounting the generators on a wall. Models 75-45 and 75-45EU fit easily on top of a bench or table. When not wall-mounted, Models 75-52 and 75-52EU should be placed on the floor.

Pure air dryer

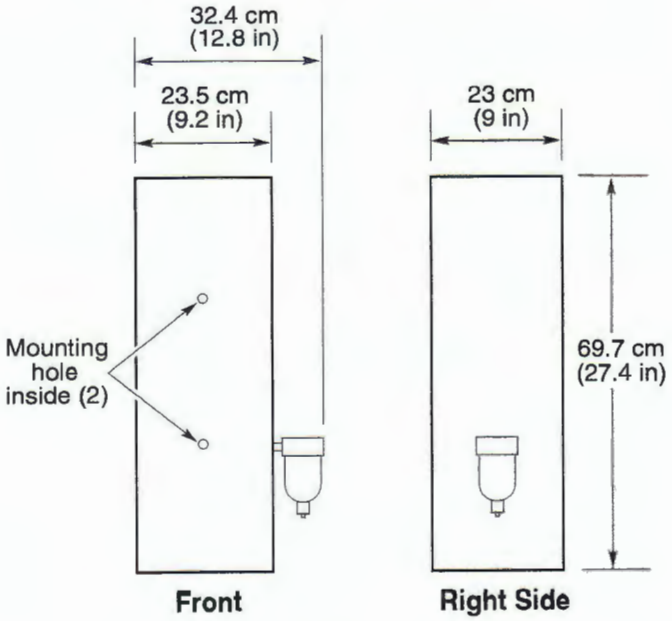
Thermo Nicolet also offers a complete dry-air generating system. Since this system contains an air compressor, it can be used in facilities that do not have a source of compressed air.

The system includes an air compressor, a dryer, prefilters, a final filter/moisture indicator and flow controls. The following table gives the Thermo Nicolet part numbers and specifications for the two available generator models.

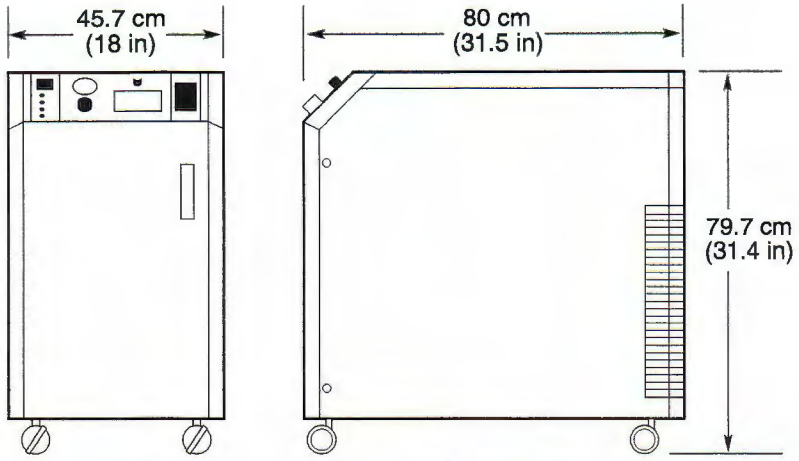
	74-5041	*74-5041EU*
Thermo Nicolet part number	869-065500	869-065600
nom. input line voltage, freq.	110 VAC, 60 Hz	220 VAC, 50 Hz
dew point	-73°C (-100°F)	-73°C (-100°F)
max. air flow rate at 80 psig	28 L/min (60 scfh)	28 L/min (60 scfh)
CO_2 concentration	<1 ppm	<1 ppm
outlet port size	1/4 inch NPT (female)	1/4 inch NPT (female)
shipping weight	114 kg (250 lb)	114 kg (250 lb)



Model 75-45 (and 75-45EU)



Model 75-52 (and 75-52EU)



Pure air dryer

Note Read the manufacturer's instructions before installing air-drying equipment or performing any maintenance, such as changing the filters. The installation and maintenance of air-drying equipment is *your* responsibility. Failure to change the filters at least once a year and perform other routine maintenance can void the warranty. ▲

▲ Caution *Before* you connect a pure air dryer to the spectrometer, it is *vital* that you purge the dryer of water and particulates by running it for at least 12 hours at nominal air flow. Otherwise, you risk severe damage to the beamsplitter and detector in the spectrometer when you connect the pure air dryer. ▲

Liquid nitrogen

If you plan to use an MCT or other cooled detector in your spectrometer (not available for the Avatar 360N model) or in an accessory such as a microscope, you will need a supply of liquid nitrogen. The liquid nitrogen is used to cool the detector. The quantity of liquid nitrogen needed will vary depending on how often and for how long the detector is used. In general, approximately one liter of liquid nitrogen is consumed by an MCT detector during eight hours of continuous use. If you are using a Continuμm or Centaurμs microscope, 750 milliliters will provide approximately 18 hours of cooling.

⚠ Warning Liquid nitrogen is extremely cold and therefore potentially hazardous. Avoid contact with skin. Wear protective clothing and follow standard laboratory safety practices to prevent injury. ▲

Accessory Modules

This chapter provides preinstallation considerations and dimensional drawings for accessory modules. If you ordered an accessory module with your Avatar spectrometer (not available for the Avatar 360N model), study the drawings to help plan your spectrometer work space.

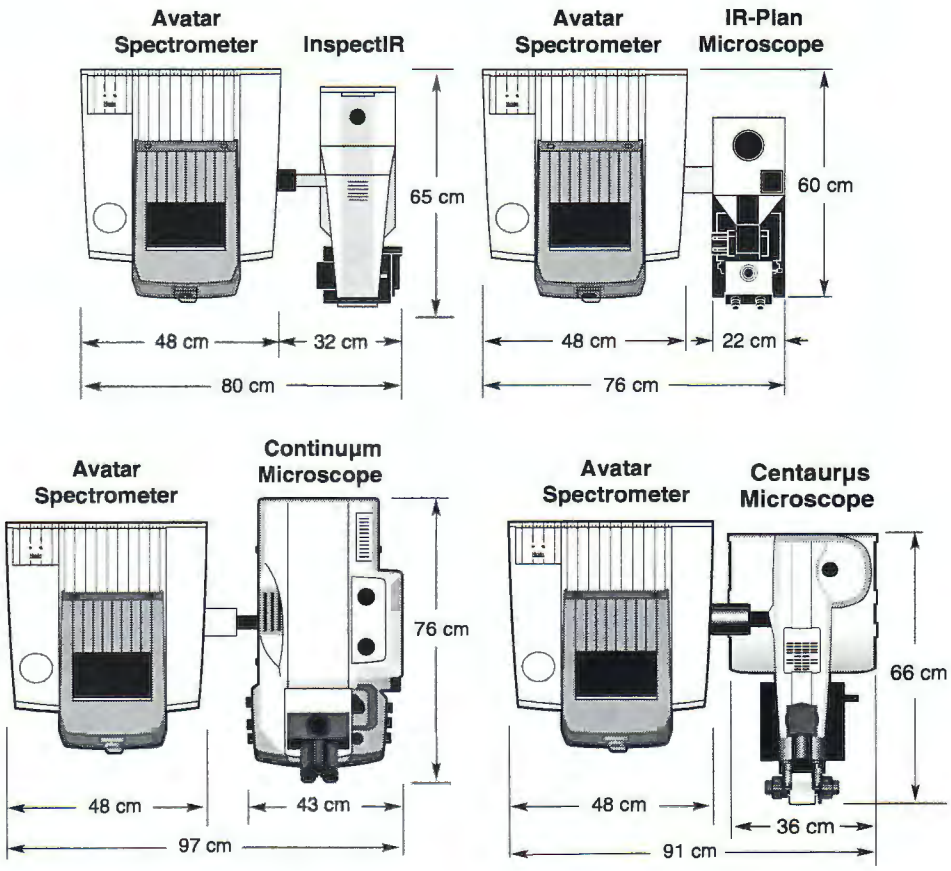
Thermo Nicolet will install all infrared microscopes and liquid analysis systems.

IR microscopes

Thermo Nicolet offers infrared microscopes that attach directly to the right side of the spectrometer. Microscopes can be installed between the spectrometer and other accessory modules.

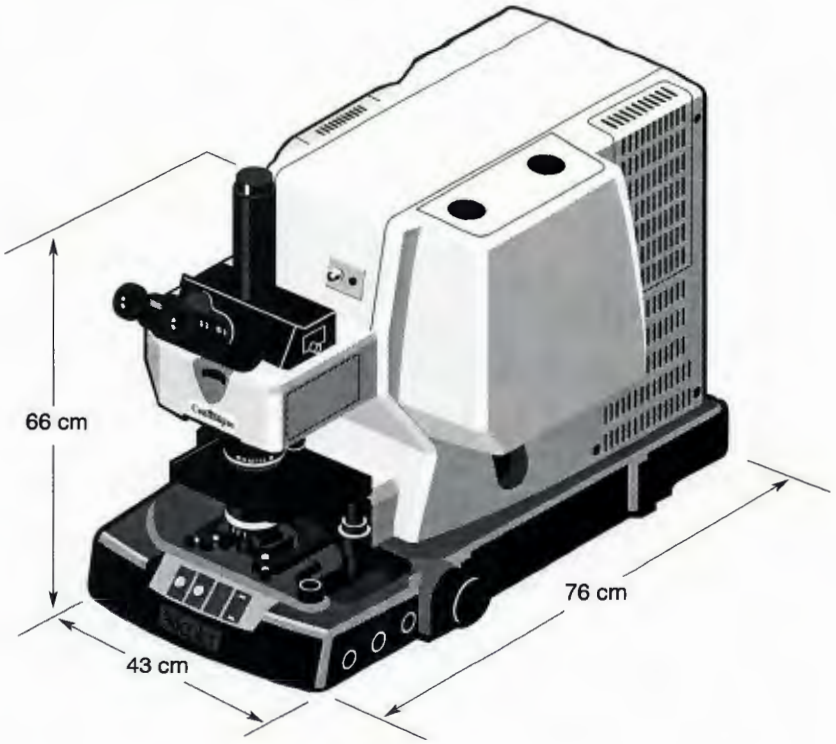
Note Choose a table height that allows you to work comfortably with the spectrometer. If you will be using a Thermo Nicolet microscope accessory, keep in mind that the eyepiece will be 48 to 53 cm (19 to 21 in) above the table top. ▲

If you purchased a Continuμm, Centaurμs, InspectIR, or IR-Plan microscope, use the drawing below to plan your spectrometer work space.



Continuµm microscopes

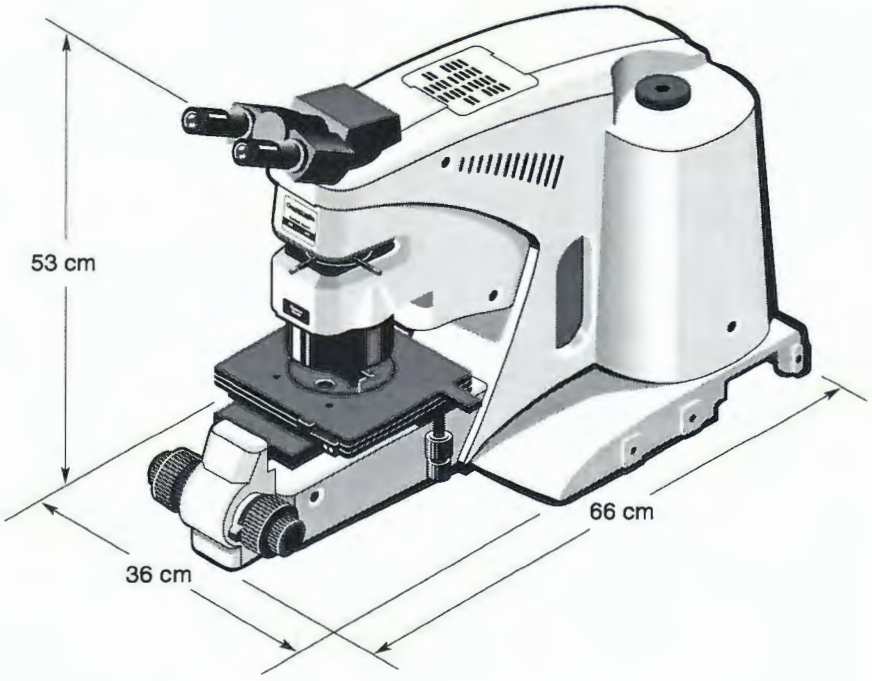
The Continuµm microscope weighs approximately 58 kg (128 lb) and has the dimensions shown in the following illustration.



Continuµm dimensions

Centaurμs microscopes

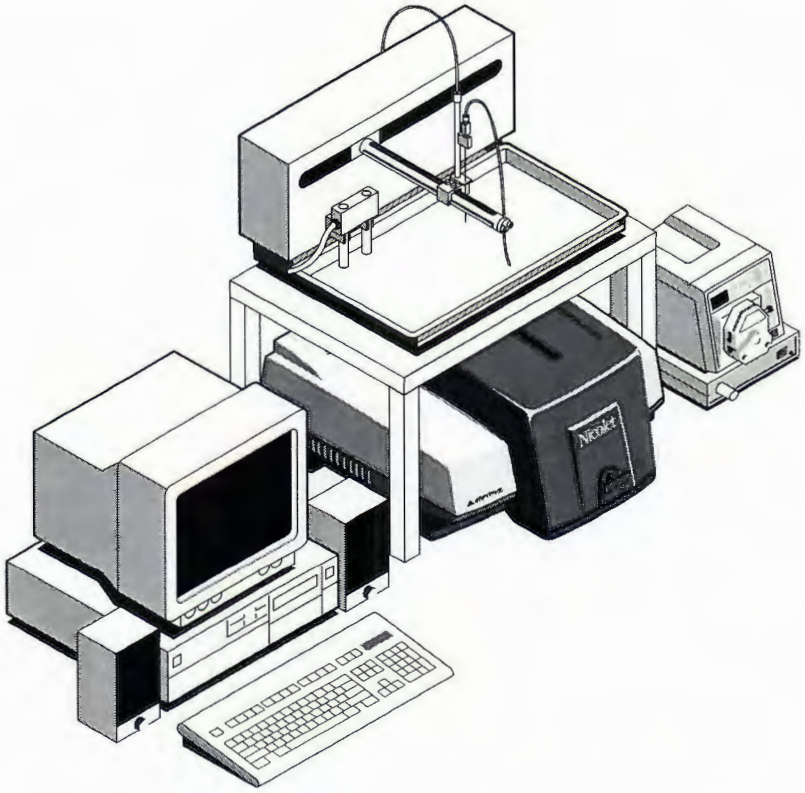
The Centaurμs microscope weighs approximately 30 kg (65 lb). The beam port on the Centaurμs can attach to right side of an Avatar spectrometer. When the beam port attachment is present, 7.6 cm (3 in) is added to the width of the microscope. In addition, if the optional eyepiece is installed, 11.5 cm (4.5 in) is added to the height. Use the dimensions shown in the following illustration to help plan your work space.



Centaurμs dimensions

Liquid Analysis System

The Thermo Nicolet Liquid Analysis System can include a PLUS 2 (programmable liquid uptake system) and an autosampler. The following illustration shows the system with the most commonly used components. The overall width of this configuration is approximately 155 cm (61 in).



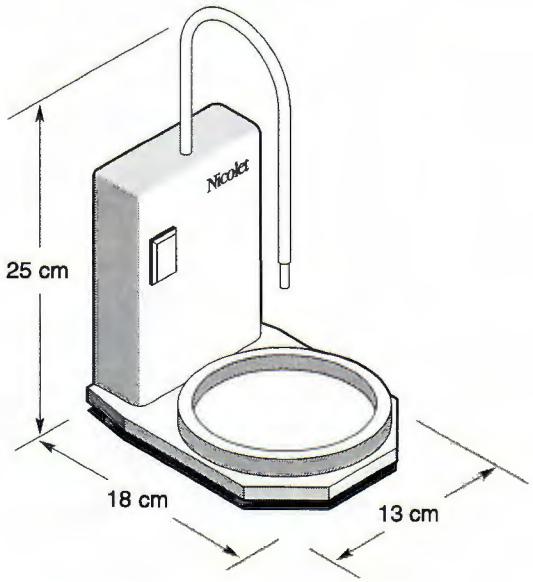
Avatar 360 with a PLUS 2 Liquid Analysis System

Follow the recommendations below to prepare your site for installing the Thermo Nicolet Liquid Analysis System.

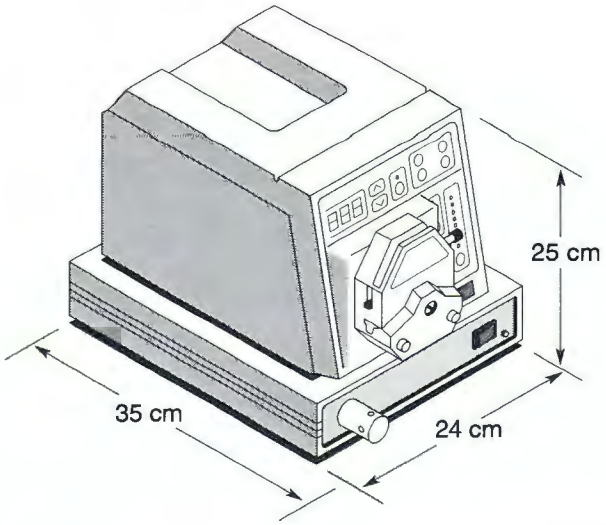
- We highly recommend dry-air purge. See "Purge gas" for more information.
- The configured system requires about 2 meters (6 feet) of spectrometer space. The autosampler must be located on the right side of the spectrometer.
- A wash solvent reservoir containing the appropriate solvent must be located behind the autosampler. The reservoir is *not* included with the system.
- The waste reservoir (provided) must be located below the system for gravity-fed waste containment.
- Be sure to have a sample material that is appropriate for performing a pathlength calibration of the sample cell. For example, the material required for used lubricating oil analysis is 99% HPLC grade or purer heptane. You will need 2 to 8 liters of this material per year, depending on the frequency of calibration.
- Be prepared to supply some representative samples for verifying that the system is working properly at the time of installation.

The following dimensions and weights of system components are approximate. Weights vary depending on the options you ordered with your system.

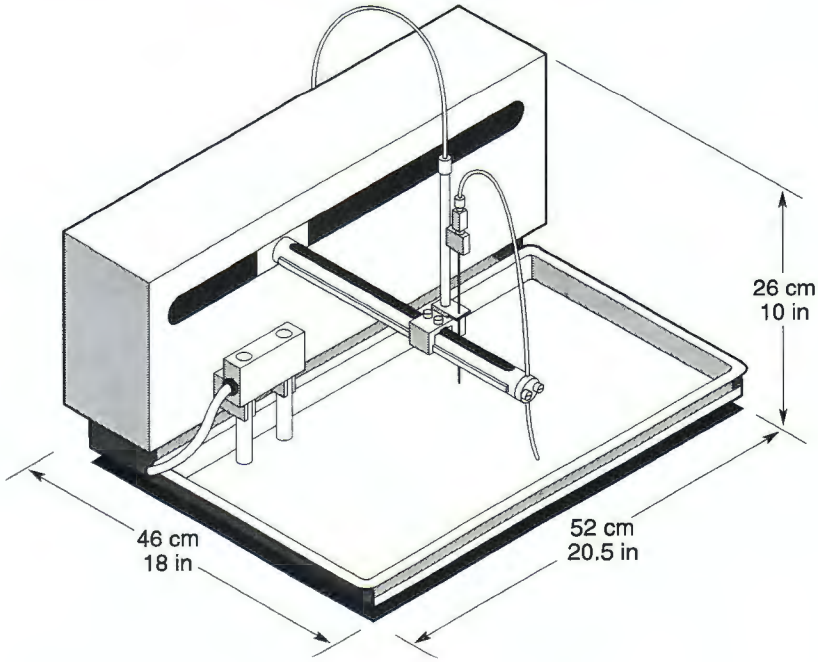
Component	*Width*	*Height*	*Depth*	*Weight*
autosampler	52 cm (20.5 in)	26 cm (10 in)	46 cm (18 in)	10.5 kg (23 lb)
PLUS 2 power supply/ valve module and pump	24 cm (10.0 in)	25 cm (10.6 in)	35 cm (12.8 in)	8.2 kg (18 lb)
Liquid uptake module	13 cm (5.0 in)	25 cm (10.0 in)	18 cm (8.1 in)	2.7 kg (6 lb)



Liquid uptake module



PLUS 2 power supply/valve module and pump



Autosampler

Minimum Computer Requirements

If you are supplying your own computer, be sure that it meets the following minimum requirements for hardware and software.

- Intel® Pentium® processor with 233 MHz clock speed.
- 64 megabytes of random access memory (RAM).
- 4 megabytes of video RAM
- The capability of displaying at least 256 colors.
- Hard disk size of at least 2.0 gigabytes.
- Quad speed CD-ROM drive.
- A 1.44-megabyte floppy disk drive for 3.5-inch floppy disks.
- A 15-inch SVGA monitor with 800 by 600 resolution.
- A keyboard and serial or bus mouse or PS/2®-style mouse.
- A 16-bit Sound Blaster® compatible sound card.
- Computer compatible speakers for sound card.
- Two serial ports (if you plan to use a PLUS 2 liquid analysis system).
- Two ECP bi-directional parallel ports.
- Three ISA/PCI slots. (One is needed for an additional ECP parallel port that can be used to connect an external printer. The others can be used for an optional network card, sound card, video card, or modem.)
- One of the following versions of Windows® software:
  - Windows 98
  - Windows NT 4.0 or 2000
  - Windows Me

20° and 22° C (68° and 72° F) for best performance.

- ☐ The humidity (noncondensing) is between 20% and 80%.
- ☐ The environment is free of dust.

Utility service

- ☐ A dedicated power line is available.
- ☐ There is sufficient power to run the spectrometer and all accessories.
- ☐ There is a definite earth ground (*not* neutral) for power outlets.
- ☐ Adequate to run all [illegible] is installed.

Other supplies

- ☐ A supply of liquid nitrogen is available if an MCT or other cooled detector will be used.
- ☐ If the system will include a liquid analysis system, 2 to 8 liters of the appropriate material is available for calibrating the sample cell.

If you are supplying your own computer

- ☐ The computer meets the minimum requirements.
- ☐ Before your Avatar system arrives, make sure your computer's parallel port is configured for ECP operation and all power management features are disabled. Contact your computer support personnel if you need help correctly configuring these features in the BIOS.
- ☐ Windows operating system software is installed on the computer.

Preinstallation Check List

Use this check list to ensure that all preinstallation steps have been performed. You will then be ready to install the system.

Location

- ☐ The location is easily accessible to Thermo Nicolet personnel.
- ☐ The system fits through the necessary doorways and elevators.
- ☐ There are no floor vibrations from air conditioners, motors, and the like.
- ☐ There are no intense magnetic fields.
- ☐ The floor and table(s) are strong enough to support the system.
- ☐ The table height is convenient for use of the spectrometer and all accessories.
- ☐ There is adequate clearance around and above the system.
- ☐ A telephone is available within reach of the operator on line.

Environmental considerations

- ☐ There is no static-producing carpet.
- ☐ No windows are nearby.
- ☐ The temperature stays between 16° and 27°C (60° and 80°F), 20° and 22°C (68° and 72°F) for best performance.
- ☐ The humidity (noncondensing) is between 20% and 80%.
- ☐ The environment is free of dust.

Utility service

- ☐ A dedicated power line is available.
- ☐ There is sufficient power to run the spectrometer and all accessories.
- ☐ There is a definite earth ground (*not* neutral) for power outlets.
- ☐ Adherence to local building and safety codes is verified.
- ☐ A source of dry air or nitrogen is installed, if you have a humid environment.

Other supplies

- ☐ A supply of liquid nitrogen is available if an MCT or other cooled detector will be used.
- ☐ If the system will include a liquid analysis system, 2 to 8 liters of the appropriate material is available for calibrating the sample cell.

If you are supplying your own computer

- ☐ The computer meets the minimum requirements.
- ☐ Before your Avatar system arrives, make sure your computer's parallel port is configured for ECP operation and all power management features are disabled. Contact your computer support personnel if you need help correctly configuring these features in the BIOS.
- ☐ Windows operating system software is installed on the computer.

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