NMR

picoSpin

Site and Safety Information

269-298101 Revision A October 2013

Thermo SCIENTIFIC

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For Research Use Only. This instrument or accessory is not a medical device and is not intended to be used for the prevention, diagnosis, treatment or cure of disease.

WARNING Avoid an explosion or fire hazard. This instrument or accessory is not designed for use in an explosive atmosphere.

Site and Safety Information

The Thermo Scientific™ picoSpin™ spectrometer is designed to be extremely durable and reliable. It will work under adverse conditions for extended periods, but to get repeatable, accurate results consistently, maintain a stable working environment. Before installation, please read this manual and follow its recommendations for the system.

Safety and Special Notices

In many cases, safety information is displayed on the instrument itself. The symbol indicates that there is additional safety information in the documentation and failure to heed the safety precautions could result in injury.

WARNING Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE Follow instructions with this label to avoid damaging the system hardware or losing data.

Note Contains helpful supplementary information.

The following table lists some of the safety symbols and their indications that may appear in the user documentation.

Symbols	Indication
	This is a mandatory action symbol. It is used to indicate that an action shall be taken to avoid a hazard.
	This is a prohibition symbol. The graphic in this symbol is used to alert the user to actions that shall not be taken or shall be stopped.
	This is the general warning sign. Failure to heed the safety precautions could result in personal injury.
	**Avoid shock hazard**. If you see either of these symbols, there is a risk of electrical shock in the vicinity. Only qualified persons shall perform the related procedures.
	**Avoid toxic inhalation**. Materials such as 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.
	**Avoid pinch hazard**. If you see this symbol, there is a risk of pinch, crush or impact hazards in the vicinity.
 	**Avoid risk of personal injury**. Use proper lifting techniques when moving the spectrometer or other system components if you see either of these symbols.
	**Avoid personal injury**. Handle the syringe carefully, avoiding the needle. If you see this symbol, follow standard infection control procedures as specified by the Centers for Disease Control and Prevention (USA) or local equivalent.
	**Avoid chemical burns**. This symbol alerts you to possible skin irritation. Wear gloves when handling toxic, carcinogenic, mutagenic, or corrosive or irritant chemicals. Use approved containers and proper procedures to dispose of waste.

Symbol	Description
	Alternating current
	Earth terminal or ground
	Direct current
	Protective conductor terminal

Symbol	Description
	Frame or chassis terminal
	Fuse
	Power on
	Power off

Workspace Consideration

This section contains the information for use when planning the workspace for the system.

Instrument	Weight	Dimension (W x D x H)	Clearance Needed
picoSpin 45	10.5 lbs	8 x 5.75 x 11.5 in	1 inch on right side 2 inches on the back side 6 inches in front
picoSpin_80	43 lbs	14.5 x 17 x 10 in	1 inch on right side 2 inches in the back 6 inches in front

Plan space for any optional equipment, computer, monitor and keyboard. Place the computer near the instrument. A standard 7 foot data cable connects the instrument to the computer.

Lifting or Moving the Instrument

The picoSpin 45 can be lifted safely by one person; however, the picoSpin 80 requires a two-person lift.

CAUTION Avoid risk of personal injury. Your instrument cannot be lifted safely by a single person. Lifting or moving the instrument requires two people. Use proper lifting techniques when lifting or moving the instrument or other system components.

When the System Arrives

WARNING Avoid personal injury. If this equipment is used in a manner not specified in the accompanying documentation, the protection provided by the equipment may be impaired.

CAUTION Avoid shock hazard. Be sure to unplug the system from the power source before servicing any replacement parts.

When the instrument arrives, check the exterior of the shipping box for signs of damage. If damage is apparent, contact us for instructions.

- Inside the shipping box, the instrument is wrapped in a plastic bag
- Allow the instrument to reach room temperature before opening the bag

The warranty will not cover:

- Damage due to improper moving techniques
- Damage due to removing the sealed plastic bag before the instrument has come to room temperature

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

Environmental Factors

Temperature

The instrument is designed for indoor use at altitudes up to 2,000 m (6,500 ft). It operates reliably at temperatures between 10 °C and 40 °C (50 °F and 104 °F).

Once the instrument has been installed, plan to leave it turned on. The internal temperature and stability of the instrument will change significantly if it is switched on and off daily. Long-term stability improves with the length of time the instrument 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.) Also keep sources of heat, such as hot plates and heating mantles, away from the instrument. Do not place it near heating or air conditioning vents.

Vibration

Floor vibration or acoustical noise from heavy manufacturing equipment, computer equipment, or other sources will not damage the system, but it can affect performance and spectral quality. Keep the system away from machinery that may vibrate the floor, and minimize or eliminate acoustic noise and vibration wherever possible. If vibration is a problem, consider placing the instrument on a marble-top table or counter or obtaining a vibration isolation system.

Electromagnetic Fields

Electromagnetic fields, such as those produced by superconducting magnets, can affect performance (e.g., magnetic stirrers and stirring bars, magnetic mounts, refrigerator magnet, etc.) Minimize or eliminate exposure to magnetic fields wherever possible.

Some wireless devices may also affect instrument performance. If this type of interference is suspected, move all wireless devices at least 2.0 m (6.5 ft) away from the instrument.

Dust and Particles

The instrument must be installed in a location where it will not be exposed to excessive dust or other airborne particulate matter.

If the outside of the spectrometer needs cleaning, turn it off and disconnect the power supply. Use a damp (not wet), soft cloth and a mild soap to clean the outside of the spectrometer.

Humidity and Moisture

This instrument may be damaged by condensation or by electrostatic discharges. The recommended operating range is between 30% RH and 80% RH, non-condensing.

Static Electricity

Since static electricity can destroy electronic components, your instrument was specially designed to meet the international standard: IEC 61000-4-2; electrostatic discharge immunity test for measurement, control, and laboratory use. If you have trouble with static electricity in your laboratory, you can further protect your instrument by following these guidelines:

- 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 your instrument. 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 toxic solvents or sampling flammable gases). Chlorinated solvents, perfluorochlorinated solvents, and other solvents containing halogenated hydrocarbons are often used and as by-products 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 instrument if the concentration level of corrosive gases in the air is excessively high due to improper sampling techniques.

WARNING Avoid toxic inhalation. 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 instrument, and do not leave these types of solvents in the sample cartridge for an extended time.

Electrical Requirements and Safety

Power supplied to the system must be from dedicated, uninterrupted sources. Power must be free of voltage dropouts, transient spikes, frequency shifts, and other line disturbances that impair reliable performance.

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 us or your local electrical authority for more information.

The following table lists the specifications for electrical service. Contact our service representative in your area if you have questions about the requirements.

Requirements	Specifications
Input current	1.5 A (max.)
Input voltage	100-240 VAC
Line frequency	50-60 Hz
Line disturbances	Sags, surges or other line disturbances must not exceed 10% of input voltage (even for a half cycle).
Noise	< 2 V (common mode) < 20 V (normal mode)

Grounding

CAUTION Avoid shock hazard. Each wall outlet used must be equipped with a ground. The ground must be a noncurrent-carrying wire connected to earth ground at the main distribution box.

Power Cords

Be sure to use an appropriate grounded power cord for your electrical service. If the power cord received is not appropriate for the electrical system in your location, or if the power cord becomes damaged, contact us.

Fire Safety and Burn Hazards

NOTICE Do not position the instrument so that it is difficult to operate the power switch or access the power supply and power cord.

To avoid a burn injury and the risk of fire or explosion:

- Use caution when testing flammable or explosive samples (see "Hazardous Materials.")
- Turn off the instrument and wait 10 minutes before replacing components
- Never block any of the vents on the instrument or its power supply
- Only use exact replacement power supplies from us

Hazardous Materials

WARNING Avoid personal injury. Use a fume hood, if necessary, and wear appropriate protective equipment. Ejecting air bubbles from the syringe may eject a small volume of liquid that could be hazardous.

CAUTION Avoid personal injury.

- Wear eye protection at all times when handling liquid chemicals
- Do not breathe hazardous vapors
- Avoid skin contact with hazardous liquids and vapors
- Eliminate ignition sources and prevent significant waste volume buildup

Many standard spectroscopy methods are based on the use of solvents. Sample materials in liquid form can be measured using your instrument. Use appropriate handling procedures and personal protective equipment based on sample material.

WARNING Avoid personal injury.

- Needles and syringes should be considered regulated waste regardless of use
- Follow your local EH&S guidelines for disposal
- Never throw these items into the regular trash or dumpsters

WEEE Compliance

This product is required to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2002/96/EC. It is marked with the following symbol:

Thermo Fisher Scientific has contracted with one or more recycling or disposal companies in each European Union (EU) Member State, and these companies should dispose of or recycle this product. See www.thermo.com/WEEERoHS for further information on Thermo Fisher Scientific's compliance with these Directives and the recyclers in your country.