

**IR SERIES**

# **Spectrometer Safety Guide**

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# Operating Your Spectrometer Safely

This manual contains a summary of the safety precautions that must be followed when using any of the following Thermo Scientific IR Series spectrometers:

- IR100
- IR200
- IR300

Each person who will be using these instruments should read this manual. Safety information is also included in the spectrometer, accessory, computer, and software manuals.

In many cases, safety information is displayed on the instrument itself. The illustrations at the end of this manual show the locations of the safety labels. Should any of these labels become loose or unreadable, Thermo Fisher Scientific will supply new ones. The parts list that came with your spectrometer or accessory contains information about obtaining replacement labels.



If you see this symbol on the spectrometer or on an accessory, be sure to read this manual and the documentation that came with the instrument or accessory. The symbol indicates that there is additional safety information in the documentation.

## Questions or concerns

In case of emergency, follow the procedures established by your facility. If you have questions or concerns about safety or need assistance with operation, repairs or replacement parts, you can contact our sales or service representative in your area or use the information at the beginning of this document to contact us.

## Manual conventions

The following conventions are used in this manual to draw your attention to important information:

**Note** Notes contain helpful supplementary information. ▲

**Important** Follow instructions labeled “Important” to avoid damaging the system hardware or losing data. ▲

**▲ Caution** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. ▲

**▲ Warning** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. ▲

**▲ Danger** Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. ▲

## General safety information

Each IR Series spectrometer and accessory is designed to comply with domestic and international safety regulations and applicable product standards. The table that follows lists each of the spectrometer models and the regulations and product standards that apply to each.

The regulation labels shown in the table usually are located on the back of the spectrometer or accessory. Check the Declaration of Conformity that came with your instrument for specific information about conformity with particular directives and standards. The regulatory organizations are described here.

**CE (Conformité Européenne)** — The CE mark indicates compliance with the European Union's applicable New Approach Directives. The CE mark is a self declaration and self marking process. Once a manufacturer has proven that the particular equipment meets the requirements of the CE and has collected supporting data, that equipment may be marked with the CE.

**ETL (ETL SEMKO, a division of Intertek Testing Services)** — ETL SEMKO is an OSHA accredited Nationally Recognized Testing Laboratory (NRTL), a Standards Council of Canada (SCC) accredited Testing Organization and Certification Organization, an IECEE accredited National Certification Body, and a Notified Body for Europe that provides testing and certification services for the products. The ETL symbol indicates that the instrument has been inspected and approved by an independent testing laboratory.





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<i>Model</i>	<i>Regulations and product standards</i>
IR100 IR200 IR300	<ul style="list-style-type: none"><li>• UL 3101-1 (1993) Electrical equipment for laboratory use. Part 1: general requirements.<ul style="list-style-type: none"><li>• Installation category II</li><li>• Pollution degree 2</li></ul></li><li>• CSA C22.2 No. 1010 (1992) Safety requirements for electrical equipment for measurement, control, and laboratory use</li><li>• 73/23/EEC (1973) Low voltage directive</li><li>• EN 61010-1 (1993) and A2 (1995) Safety requirements for electrical equipment for measurement, control, and laboratory use</li><li>• 89/336/EEC (1989) EMC Directive</li><li>• IEC 61326-1 Electrical equipment for measurement, control, and laboratory use – EMC requirements<ul style="list-style-type: none"><li>• IEC 1000-4-2 (1995) Electrostatic discharge immunity</li><li>• IEC 1000-4-3 (1998) Electromagnetic field immunity</li><li>• IEC 1000-4-4 (1995) Electrical fast transient burst</li><li>• IEC 1000-4-5 (1995) Surge immunity</li><li>• IEC 1000-4-6 (1996) Immunity to conducted disturbances induced by radio frequency fields</li><li>• IEC 1000-4-11 (1994) Voltage dips short interruptions and voltage variation immunity;</li><li>• EN 61000-3-2 (1995) Voltage harmonics</li><li>• EN 61000-3-3 (1995) Voltage fluctuation and flicker</li><li>• CISPR 11 (1997) Class A; Limits and methods of electromagnetic disturbance characteristics of industrial scientific and medical (ISM) radio frequency equipment.</li></ul></li><li>• EN 60825 (1994); Safety of laser products</li><li>• U.S. 21CFR 1040.10; Safety of laser products</li></ul>

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## Fire safety and burn hazards

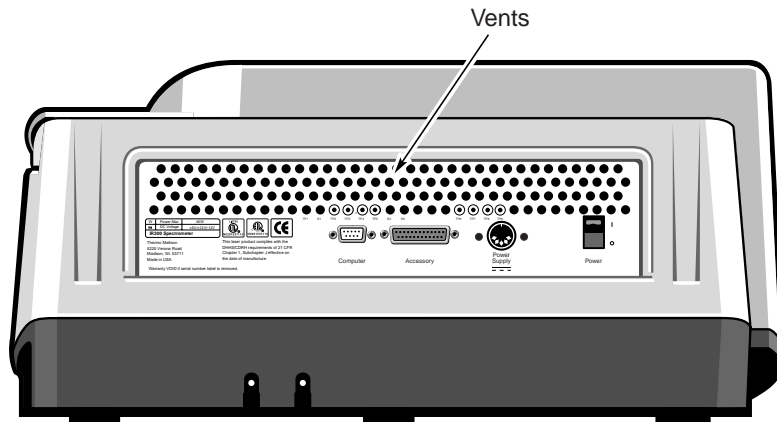
If either of the following symbols appear inside the spectrometer, they warn you about hot surfaces in the vicinity of the symbol.



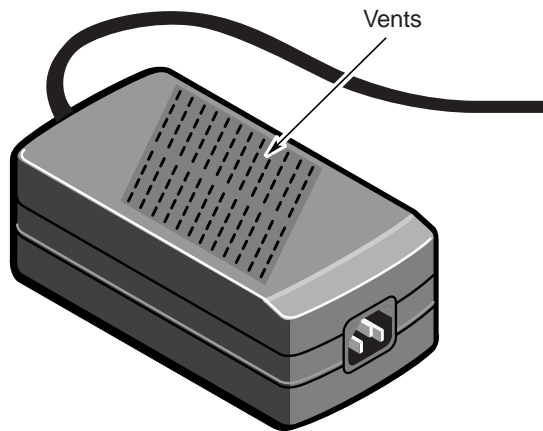
To avoid a burn injury and the risk of fire or explosion, follow these guidelines:

- Do not test flammable or explosive samples.
- Use nitrogen or dried air only to purge your spectrometer and accessories.
- After you turn off your spectrometer, wait 15 minutes before you replace components.
- Never block the vents on a spectrometer power supply or on the spectrometer itself.
- Use exact replacements for power supplies, variations in power supply specifications affect the safety of your instrument.

**Note** Touching the HeNe laser poses no burn hazard. If you must replace the laser assembly, you can begin the procedure immediately after turning off the spectrometer power. ▲



*IR100, IR200, and IR300 spectrometer vent locations*



*IR300 spectrometer power supply vent locations*

The following Cautions and Warnings provide additional information about fire safety and preventing burn hazards.

**▲ Warning**

*Never* use a flammable gas to purge a spectrometer. The purge gas must be free of oil and other reactive materials. Heat from the source or from laser absorption may ignite flammable gases or reactive materials in purge gas. ▲

**Environmental conditions**

IR Series spectrometers and accessories are designed for indoor use at altitudes up to 2,000 meters (6,500 feet).

They operate reliably at temperatures between 16° C and 25° C (60° F and 78° F). They may briefly be exposed to temperatures as low as -10° C (for example, during transport) without degradation of its safety. Temperature changes may result in drift in the system response.

FT-IR spectrometers must be protected from excessive humidity, since the beamsplitters, detectors, and other components may corrode with exposure to moisture. Maintain humidity in the range of 20% to 50% noncondensing. To accomplish this, the IR Series spectrometers are sealed and desiccated. These spectrometers require purging only in environments that are so moist that the desiccant alone cannot fully protect the optics. Contact Customer Support, if you have questions regarding conditions at your site.

## Biohazard or radioactive materials and infectious agents

Instruments, accessories, components or other associated materials *may not* be returned to Thermo Fisher Scientific or other accessory manufacturers if they are contaminated with biohazard or radioactive materials, infectious agents, or any other materials and/or conditions that could constitute a health or injury hazard to employees.

Contact Technical Support if you have questions about decontamination requirements.

## Cleaning the spectrometer

If the outside of the spectrometer needs cleaning, turn off the power and disconnect the power cord. Then use a damp (not wet), soft cloth and a mild soap to clean the outside of the spectrometer. Do not use harsh detergents, solvents, chemicals or abrasives; these can damage the finish.

### ▲ Warning

Avoid shock hazard. Do not allow liquid to run into the power supply. Also, do not allow liquids to run down the windows in the sample compartment walls. ▲

### ▲ Important

Do not use harsh detergents, solvents, chemicals or abrasives; these can damage the finish. To avoid damaging port windows, do not allow liquid to run down to these windows. ▲

### ▲ Important

Do not attempt to clean *or even touch* the mirror surfaces. The mirrors in your spectrometer are front surfaced and can be easily scratched. Dust will not harm the infrared signal, but fingerprints can degrade spectral performance or permanently damage the mirrors. If you feel it is necessary, remove dust with a gentle stream of clean air or nitrogen. Use purge air only for cleaning mirrors; commercially prepared canned air contains contaminants that can damage the mirror surface or interfere with spectral data. ▲

## Lifting or moving the spectrometer

As listed in the table that follows, some IR Series spectrometers weigh as much as 20.5 kg (45 lb). To avoid risk of injury, always use proper lifting techniques when lifting or moving the spectrometer or other system components.

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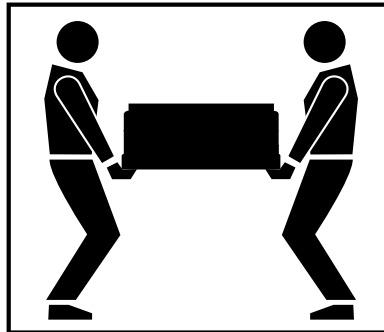
<i>Model</i>	<i>Weight</i>	
	<i>Metric</i>	<i>English</i>
IR100	14.6 kg	32 lb
IR200	13.7 kg	30 lb
IR300	20.5 kg	45 lb

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### **▲ Caution**

If you have attached a large accessory (such as a microscope) to your spectrometer, it must be removed before you attempt to lift or move the spectrometer.

Should an emergency situation arise which requires you to move a spectrometer with a large accessory attached, contact Technical Support for specific instructions. Damage from improper moving techniques is not covered by warranty.



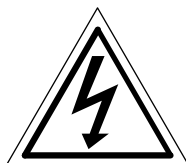
To avoid risk of injury, use proper lifting techniques. ▲





## Electrical Safety

Your spectrometer, computer, and accessories were designed with protective covers to prevent exposure to dangerous voltage and other electrical hazards. If you see either of the following symbols on your spectrometer or power supply, there is a risk of electric shock in the vicinity of the symbol.



**▲ Danger**

Only qualified Thermo Fisher Scientific service representatives should attempt to service a component that carries either of these symbols. ▲

**▲ Warning**








If a protective cover on the spectrometer, power supply, or computer appears damaged, turn off the system and secure it against any unintended operation. Always examine the protective cover for transport stresses after shipping. ▲

**▲ Caution**

Even after the spectrometer has been disconnected from all voltage sources, capacitors may remain charged for up to 30 seconds. ▲

You may also see one or more symbols on or near switches and connectors on your spectrometer. These symbols are often used to identify connectors or help you to locate user-replaceable fuses.

The table that follows shows the symbols and lists the meaning of each. Check the documentation that came with your spectrometer if you find a symbol that is not included in the table.

<i>Symbol</i>	<i>Description</i>
	Alternating current
	Direct current
	Earth terminal or ground
	Protective conductor terminal
	Fuse
	Power on
	Power off
	Caution, refer to the accompanying documents



## Powering up

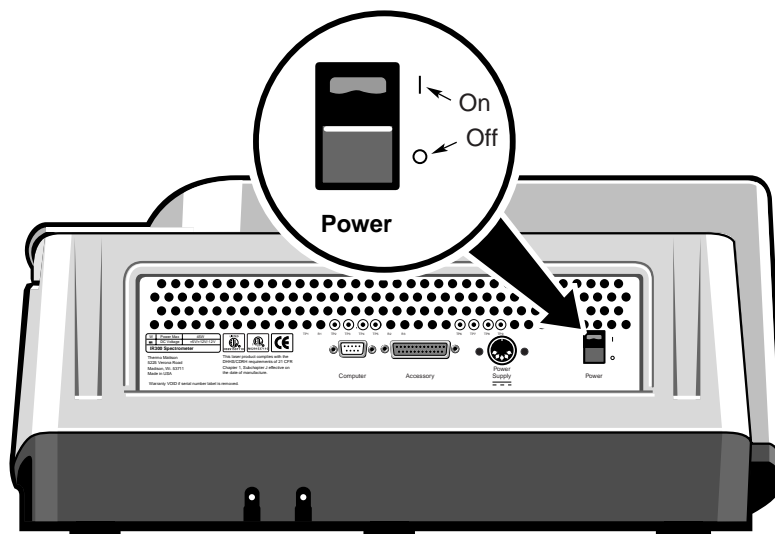
To turn on an IR Series spectrometer, press the power switch:

I = on

O = off.

**Note** For information about powering up your computer, refer to the documentation that came with the computer. ▲

**▲ Warning** Do not operate a spectrometer or an accessory without following the safety precautions described in this manual and the documentation that came with your spectrometer. ▲



**Important** Do not turn on the power to your spectrometer until all other devices, like a printer or a computer, have been connected. ▲

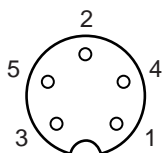
## Power supplies

The IR Series spectrometers are powered by external power supplies.

### **▲ Danger**

To avoid injury, only a qualified person using the appropriate measuring device should check the line voltage, current and frequency. ▲

The following illustration shows the DC power cable connector and lists the output voltage on each pin on the connector for an IR Series power supply.



***IR Series  
DC power connector***

<i>Spectrometer model</i>	<i>Pin</i>	<i>Output (voltage)</i>
IR100	1	DC common
	2	DC common
	3	+5 VDC
	4	DC common
	5	+12 VDC
IR200	1	DC common
	2	DC common
	3	+5 VDC
	4	DC common
	5	+12 VDC
IR300	1	DC common
	2	-15 VDC
	3	+ 5 VDC
	4	- 5 VDC
	5	+15 VDC

## Connecting an external power supply

To connect an external power supply to an IR Series spectrometer:

### **Caution**

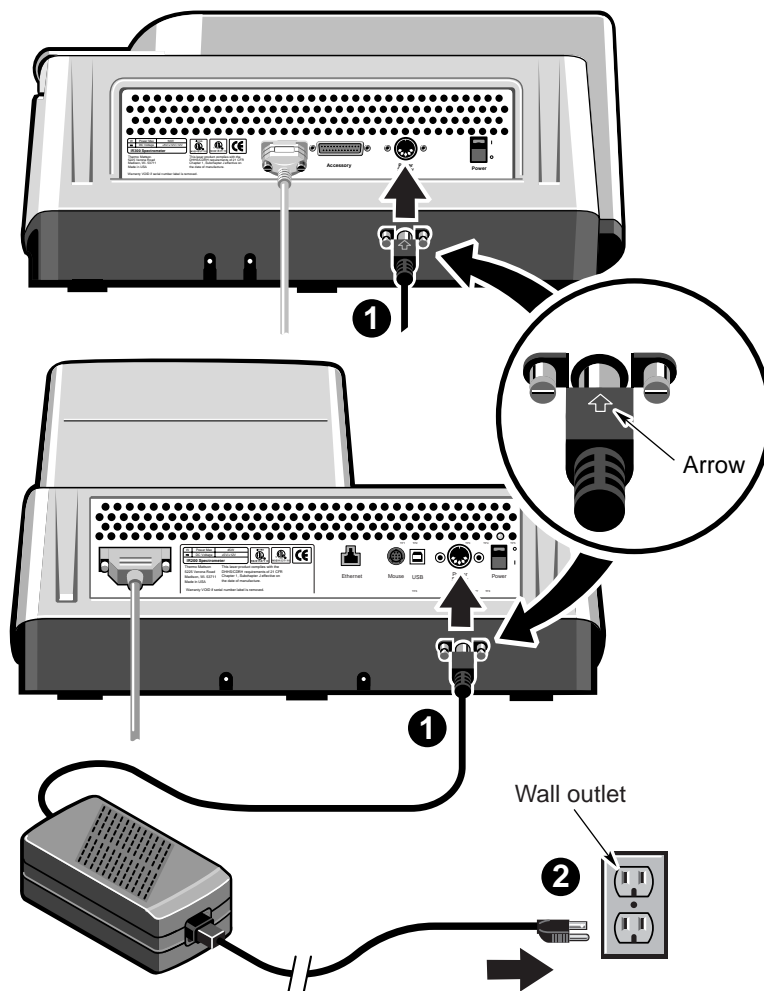
Be sure the power switch is in the off (O) position before you connect the power supply to your spectrometer. ▲

#### **1. Connect the DC power cable to the spectrometer.**

Use a flat-blade screwdriver to tighten the screws or lock ring to secure the connection.

#### **2. Connect the AC power cable to the external power supply.**

#### **3. Connect the AC power cable to AC power source.**



*Connecting an IR Series power supply*

**Fuses** The IR Series spectrometers are protected by two, 2A, time-lag (also known as T-type or slow-blow) fuses that are built into the external power supply. The fuses for these spectrometers are not individually replaceable. If the fuses blow, you must replace the power supply.

**Electrical service** Check the line voltage and frequency of the wall outlet that will be used for the spectrometer *before* you connect the instrument to or turn on the power. This should be done when the system is installed and any time the system is plugged into a different wall outlet.

**▲ Danger** To avoid injury, only a qualified person using the appropriate measuring device should check the line voltage, current and line frequency. ▲

In addition to meeting the input voltage and line frequency requirements, your electrical service must also be stable. The following table provides the specifications for an electrical service to be used to provide power to a IR Series spectrometer.

<i>Characteristic</i>	<i>Specification</i>
Input voltage	100 to 240 <i>vac</i>
Line frequency	47 to 63 Hz
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)

If you are not sure that your electrical service meets these requirements, contact Technical Support for information about a power line audit.

## Grounding

Each wall outlet you use must be equipped with a 3-wire line: live, neutral, and ground. The ground must be a non-current carrying wire connected to earth ground at the main distribution box. To assure a good ground connection and avoid shock hazard, do not use an outlet that has ground connected to a conduit ground.

### **▲ Warning**

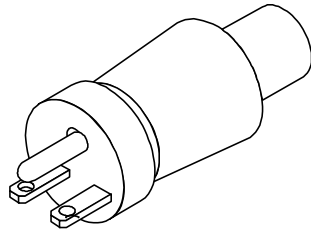
Do not disconnect protective earth terminals inside the spectrometer when the power is on. Doing so would create a shock hazard. ▲

## Power cords

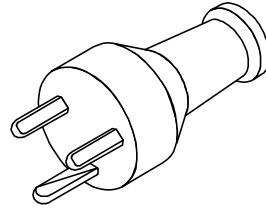
You must be sure to use an appropriate power cord for the electrical service. The power cord supplied with the spectrometer is a 3-wire, grounded power cord, appropriate for use in the country listed as the shipping destination for the spectrometer. If the power cord you received is not appropriate for the electrical system in your location, contact Technical Support and order a new power cord. The illustrations on the next page show the power cord styles that are available from Thermo Fisher Scientific.

If the power cord becomes damaged, replace it. Contact Technical Support or your local sales or service representative if you need additional information about replacement cord or extension cord specifications.

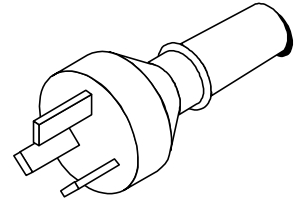
To prevent electrical hazards, do not remove or defeat the ground prong on the power cord. If you use an extension cord, it also must have a protective conductor.



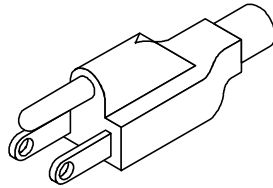
North American 220 Volt  
Plug Style: NEMA 6-15



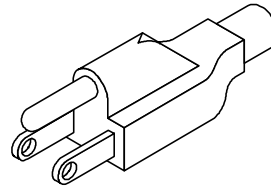
Danish style  
Plug Style: Afsnit 107-2-01



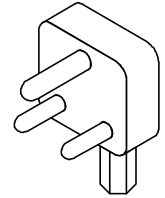
Australian style  
Plug Style: AS 3112



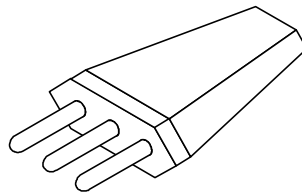
North American grounded plug  
Plug Style: NEMA 5-15



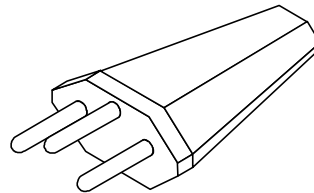
Japanese style  
Plug Style: JIS 8303



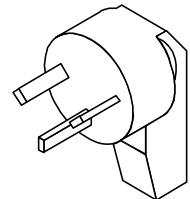
Indian, South African,  
old British style  
Plug Style: BS 546



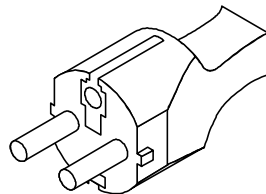
Italian style  
Plug Style: CEI 23-16/VII



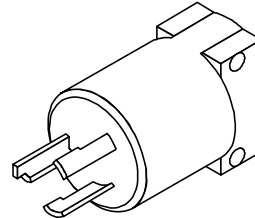
Swiss style  
Plug Style: SEV 1011



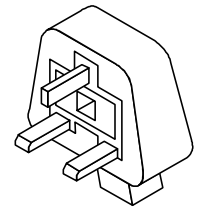
Israeli style  
Plug Style: SI 32



Continental Europe style  
or Schuko  
Plug Style: CEE7/7



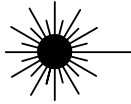
North American  
220 Volt locking  
Plug Style: NEMA L6-15



British style or  
United Kingdom style  
Plug Style: BS 1363  
with a 13 amp fuse







# Laser Safety

IR Series spectrometers are laser products. The laser source is a either a helium neon (HeNe) laser head or a diode laser. IR300 spectrometers include a HeNe laser. IR100 and IR200 spectrometers are equipped with a diode laser.

**▲ Danger**

*Never* stare into the laser beam or at its reflection. *Never* tamper with the laser head, even if you are replacing a defective laser. Exposure to laser light or high voltage may result. ▲

The United States Department of Health and Human Services warns against improper laser use, as follows:

**▲ Warning**

Use of controls or adjustments or performance of procedures other than those specified in your *User's Guide* or in *Servicing Your Spectrometer* may result in hazardous radiation exposure. ▲

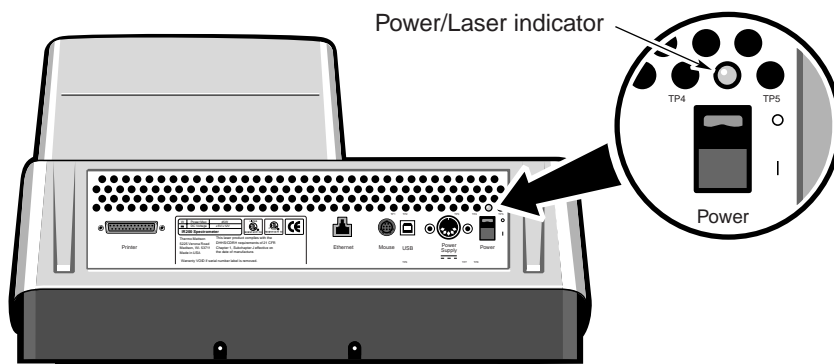
## Laser emissions

During normal use and maintenance, the accessible radiation levels for IR Series spectrometers are below Class I limits defined by the United States Department of Health and Human Services. Laser regulations apply in the U.S.A. and internationally. The IR100, IR200, and IR300 spectrometers comply with FDA performance standards for laser products except for deviations pursuant to Laser Notice 50, dated July 26, 2001.

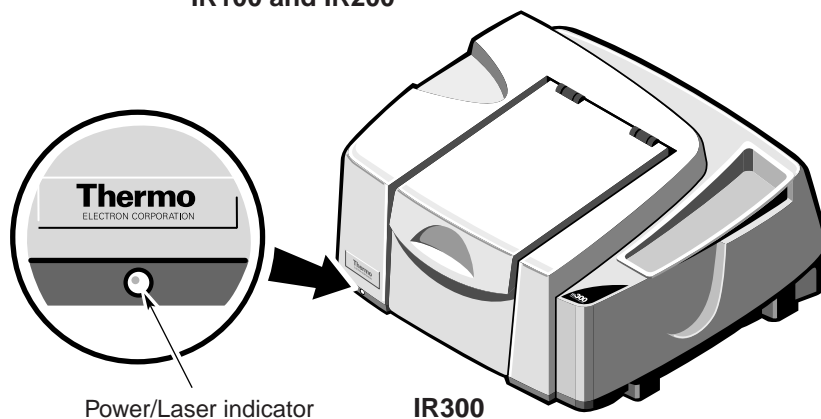
## Laser emission indicator

The IR100 and IR200 spectrometers have a power/laser emission indicator on the back panel, just above the power switch. Whenever the indicator is lit, the diode laser is on and emitting up to 1.7 mW of invisible laser radiation.

For IR300 spectrometers, the power on/laser emission indicator is located on the front of the instrument. Whenever indicator is lit, the laser is on and emitting up to 1.0 mW of visible (red) laser light.



IR100 and IR200



IR300

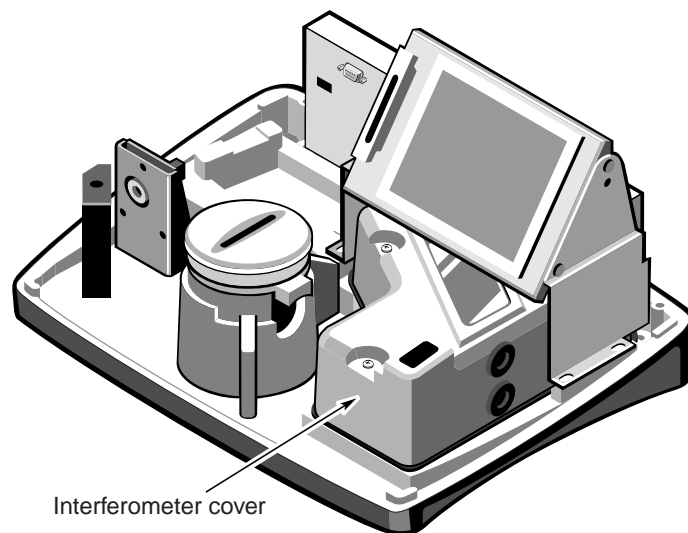
*Power on/laser emission indicators*

## Protective housing

A protective housing covers each IR Series spectrometer and accessory. More than 80 percent of the laser light is lost as it passes through the spectrometer optics. The laser light inside these spectrometers cover is in a horizontal plane. When you look through the sample compartment window, it is impossible to stare into the beam.

For IR300 spectrometers, the accessible laser radiation in the sample compartment is very low, approximately  $5.0 \mu\text{W}$  of continuous power.

For the IR100 and IR200, the diode laser emits radiation at a frequency that is not visible to the human eye. In these spectrometers, the interferometer cover provides additional protection from the invisible radiation.



The accessible laser radiation in the sample compartment of an IR100 or an IR200 is very low, approximately 5.0  $\mu$ W of continuous power. With both the main cover and the interferometer cover removed, exposure to a maximum of 1.7 mW of invisible diode laser radiation is possible.

**▲ Warning**

The IR100 and IR200 contain Class IIIR diode lasers. Never stare into a diode laser, and to avoid exposure to invisible Class IIIR laser radiation, always make sure the power is turned off and the power cable is disconnected from the back of the spectrometer before the interferometer cover is removed.

During service, if the power must be turned on after the interferometer cover has been removed, you may need to set up a temporary controlled area. Anyone who is allowed to enter (or pass through) the controlled area must wear laser safety eyewear that has an optical density of at least 0.5 and is rated for 850 nm laser radiation. ▲

## Laser safety goggles

Exposure to invisible radiation from the diode laser can result in serious injury and/or blindness. To avoid serious injury, set up a temporary controlled area and wear laser safety goggles whenever the power must be turned on after the interferometer cover has been removed from an IR100 or an IR200 spectrometer.

## Specifications

Laser safety goggles used with an IR Series spectrometer should be rated for a laser wavelength of 850 nm and an optical density of 0.5 or greater. Consult ANSI Z136.1-1993 if you have further questions about protective eye wear specifications.

**▲ Danger**

Always verify that the wavelength(s) listed on your eye wear correspond to the wavelength(s) of the laser being used. ▲

## Use and care

Whenever you use laser safety goggles, follow these guidelines.

- Check your goggles before use for pits, cracks, flaws, scratches, discoloration or other damage. If you find any type of damage, replace the eye wear immediately.
- Avoid direct exposure to chemical vapors or chemical liquids that could cause surface cracks or other damage.
- Check your goggles before use to assure that the wavelength(s) listed on the eye wear matches the wavelength(s) of the laser being used.
- Make sure that the goggles fit securely. If they do not fit properly, they cannot provide protection from laser radiation.
- Never use laser safety goggles:
  - for viewing direct beams or specular reflections
  - during recreational or sports activities
  - as sunglasses
  - while operating a motor vehicle
  - as protection against high impact or hazardous chemicals, or
  - during welding, brazing, or cutting operations.
- Use only mild soap and water to clean your goggles. Ammonia, alkaline cleaners, abrasives and solvents can damage the lenses.

## Manufacturer's laser information

In some jurisdictions you may be required to register the spectrometer; check with your company's safety officer or your local government offices. The following is an excerpt from the laser manufacturer's manual regarding the information that might be needed for registration.

<i>System</i>	<i>Characteristic</i>	<i>Specification</i>
IR100 and IR200 850 nm reference infrared (invisible)	type of laser	diode laser
	wavelength	850 nm
	minimum power	0.8 mW (TEM <sub>00</sub> )
	nominal power	1.5 mW*
	maximum power	1.7 mW*
	beam diameter	0.50 cm* (1/e <sup>2</sup> )
	beam divergence	5 mrad
	spacing C/2L	N/A
	operating voltage	2.4 VDC
	CDRH classification	IIIR
IR300 633 nm reference (red laser)	type of laser	helium/neon (HeNe)
	wavelength	632.8 nm
	minimum power	0.4 mW (TEM <sub>00</sub> )
	nominal power	0.7 mW*
	maximum power	1.0 mW*
	beam diameter	0.50 cm* (1/e <sup>2</sup> )
	beam divergence	1.61 mrad
	spacing C/2L	1039 MHz
	operating voltage	1240 ± 100 VDC
CDRH classification	II	

\* At output of laser head.



## Corrosives, Solvents, and Purge Gas

Many standard spectroscopy methods are based on the use of solvents. Sample materials dissolved in solvents can be measured using your spectrometer, but special precautions must be taken.

**Purge gas** FT-IR spectrometers contain precise optical components that may be damaged by corrosives, solvents, or a moist environment.

**Important** Optical damage caused by failure to purge the spectrometer is not covered under your warranty. ▲

The IR Series spectrometers are sealed and desiccated. The spectrometer requires purging only in environments that are so moist that the desiccant alone cannot fully protect the optics. If your spectrometer cannot be kept sealed or is underdesiccated, you must add a source of dry air or nitrogen to purge the system of moisture. For best results the purge gas should be dried to a dew point of  $-70^{\circ}\text{C}$  ( $-94^{\circ}\text{F}$ ) or below.

**▲ Danger** *Never* use a flammable gas to purge a spectrometer. Heat from the source or from laser absorption could ignite the gas. The purge gas must be free of moisture, oil and other reactive materials. Use dried air or nitrogen to purge the instrument. Other gases, even inert gases such as argon (Ar), can damage the spectrometer. ▲

## Caustic or corrosive agents

Spectrometer components may be degraded by exposure to caustic or corrosive agents or their vapors. To maintain the spectrometer in safe working condition, do not use caustic agents. Damage to the spectrometer caused by the use of caustic agents is not covered by the warranty.

## Volatile solvents

If you use volatile solvents regularly, follow these guidelines.

- Do not leave exposed solvent in the sample compartment for longer than necessary.
- Work with the sample compartment cover open.  
For most infrared and near-infrared applications, it is not necessary to close the sample compartment cover.
- Do not leave the solvents near the instrument.
- If possible, purge the sample compartment.
- Be sure that your work space is properly ventilated.

These measures will help prolong the life of your instrument and will eliminate the possibility of spectral interference caused by volatile solvent vapors.



## Solvents containing halogenated hydrocarbons

Chlorinated solvents, perfluorochlorinated solvents, and other solvents containing halogenated hydrocarbons are often used as sample solvents. The pyrolysis of these solvents by an infrared source or by excessive heating caused by laser absorption may produce hydrochloric acid (HCl), hydrofluoric acid (HF), or phosgene (COCl<sub>2</sub>)

Hydrochloric acid and hydrofluoric acid are highly corrosive and may cause accelerated corrosion of the metallic components in the spectrometer. This is particularly true in FT-IR and FT-NIR spectrometers, if the seal on the optical compartment is not properly maintained. Damage may be caused in any spectrometer, if the concentration level of corrosive gases in the air is excessively high due to improper sampling techniques.

### **Warning**

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

Solvents containing halogenated hydrocarbons should not be left in the sample compartment for an extended time.

If your measurements require the sample compartment cover to be closed, the sample compartment in an FT-IR spectrometer must be purged while the solvents are in use.

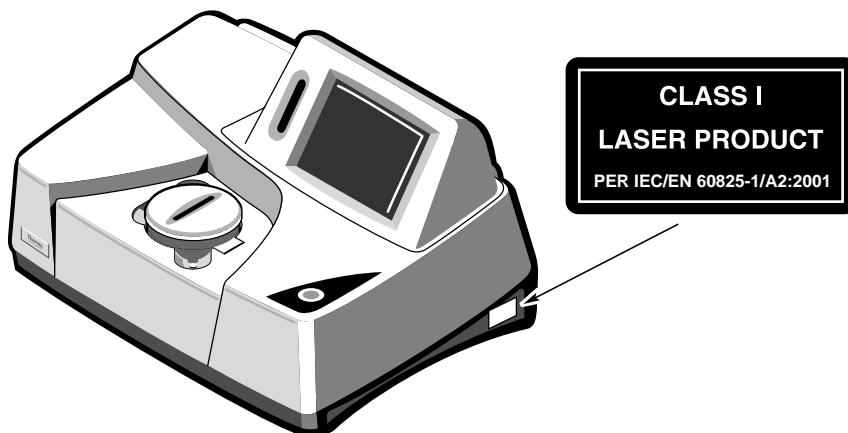




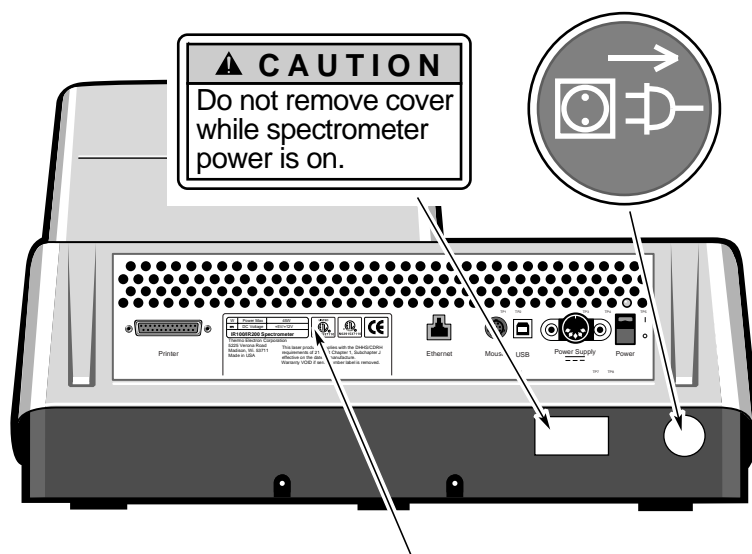
## Safety Labels

The illustrations in this section show the locations of the safety labels attached to the spectrometer. In some of the illustrations, covers have been removed to show the label locations. Should any labels come loose or become unreadable, Thermo Fisher Scientific will supply new ones. The parts list that came with your spectrometer contains ordering information.

# IR100



*Front view IR100 spectrometer*

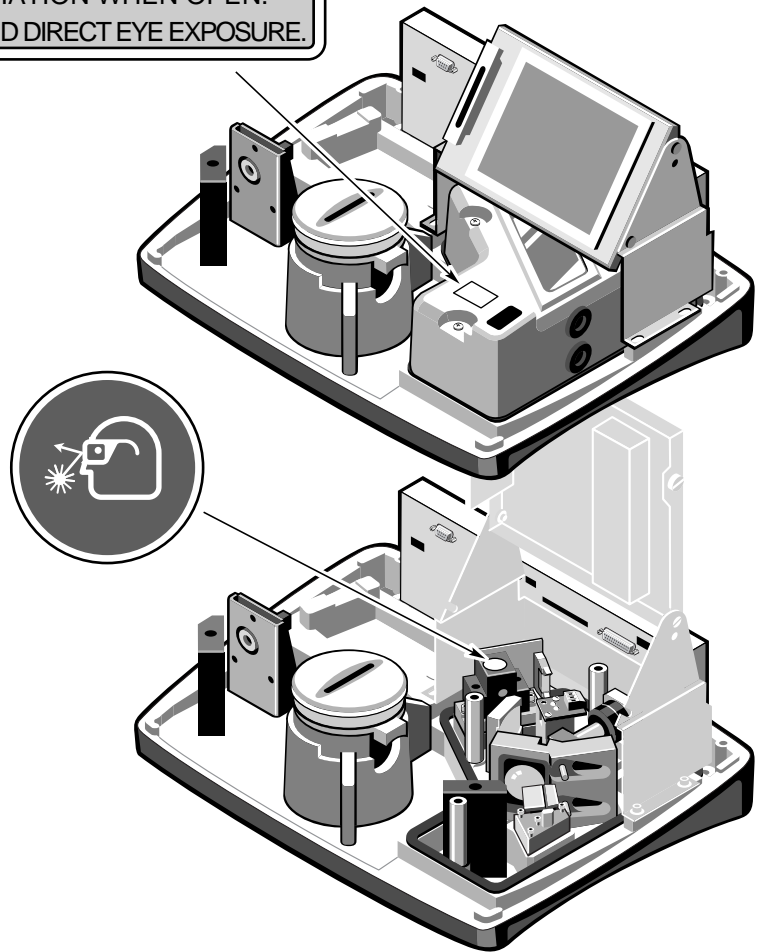


W	Power Max	45W
⎓	DC Voltage	+5V/+12V
<b>IR100/IR200 Spectrometer</b>		



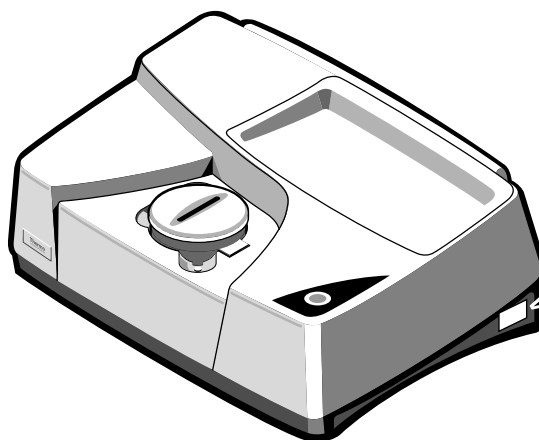
*Rear view IR100 spectrometer*

**▲ CAUTION**  
CLASS 3R INVISIBLE LASER  
RADIATION WHEN OPEN.  
AVOID DIRECT EYE EXPOSURE.



*Inside view IR100 spectrometer*

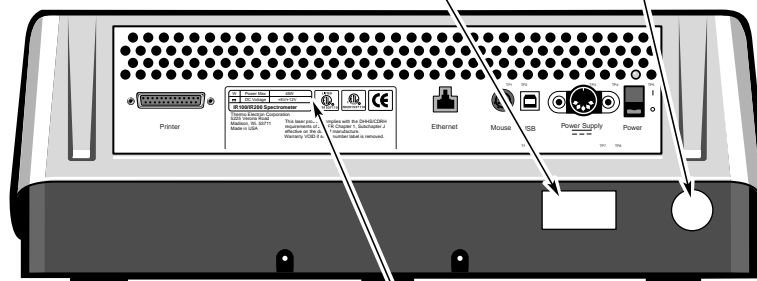
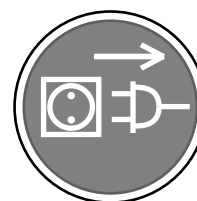
# IR200



**CLASS I  
LASER PRODUCT**  
PER IEC/EN 60825-1/A2:2001

*Front view IR200 spectrometer*

**⚠ CAUTION**  
Do not remove cover  
while spectrometer  
power is on.

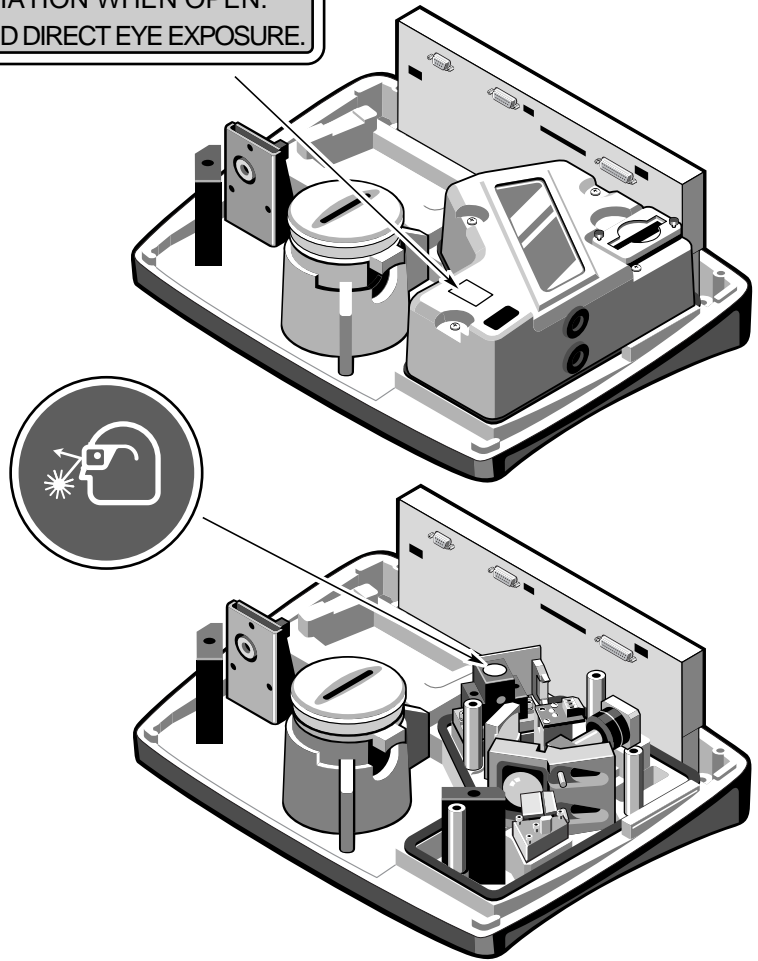


W	Power Max	45W
⎓	DC Voltage	+5V/+12V
<b>IR100/IR200 Spectrometer</b>		



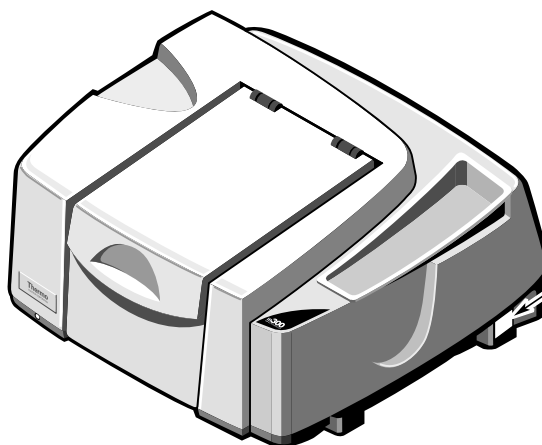
*Rear view IR200 spectrometer*

**▲ CAUTION**  
CLASS 3R INVISIBLE LASER  
RADIATION WHEN OPEN.  
AVOID DIRECT EYE EXPOSURE.



*Inside view IR200 spectrometer*

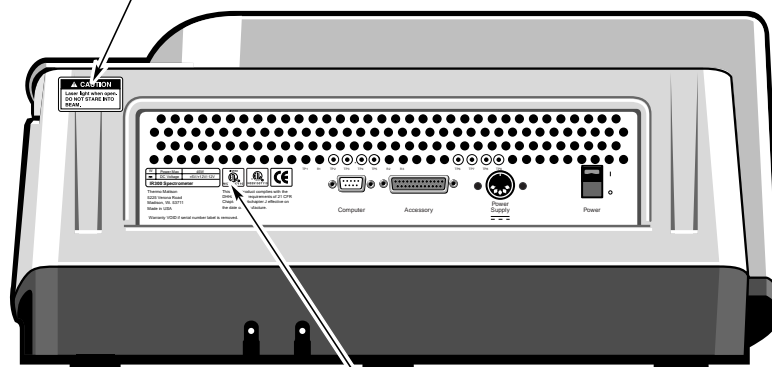
IR300



**CLASS I  
LASER PRODUCT**  
PER IEC/EN 60825-1/A2:2001

*Front view IR300 spectrometer*

**⚠ CAUTION**  
Laser light when open.  
DO NOT STARE INTO  
BEAM.



W	Power Max	45W
⎓	DC Voltage	+5V/+15V/-15V
<b>IR300 Spectrometer</b>		




LISTED  
**ETL**  
N0291537110

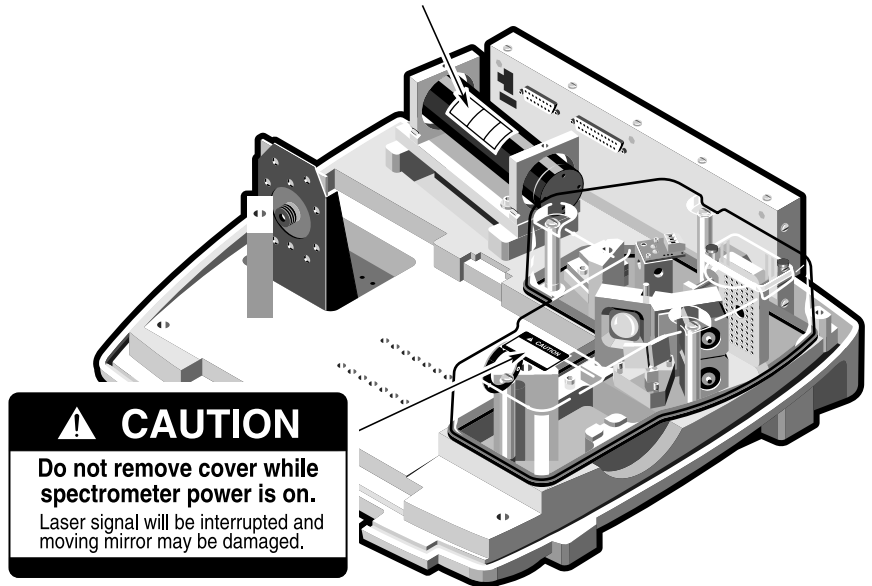
**ETL**  
N0291537110

**CE**

*Rear view IR300 spectrometer*



 <p><b>LASER LIGHT</b> DO NOT STARE INTO BEAM CLASS II LASER PRODUCT (CDRH) CLASS 2 LASER PRODUCT (IEC825 - 1:1993) 1mW MAXIMUM AT 632.8nm</p>	<p><b>MELLES GRIOT</b></p> <p><b>05-LHP-607-223</b> MAN'D: MM/DD/YR S/N: NUMBER</p> 	<p>THIS LASER PRODUCT COMPLIES WITH DHHS/CDRH RADIATION PERFORMANCE STANDARDS 21 CFR SUB-CHAPTER J AND IEC 825-1: 1993</p> 
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*Inside view IR300 spectrometer*

