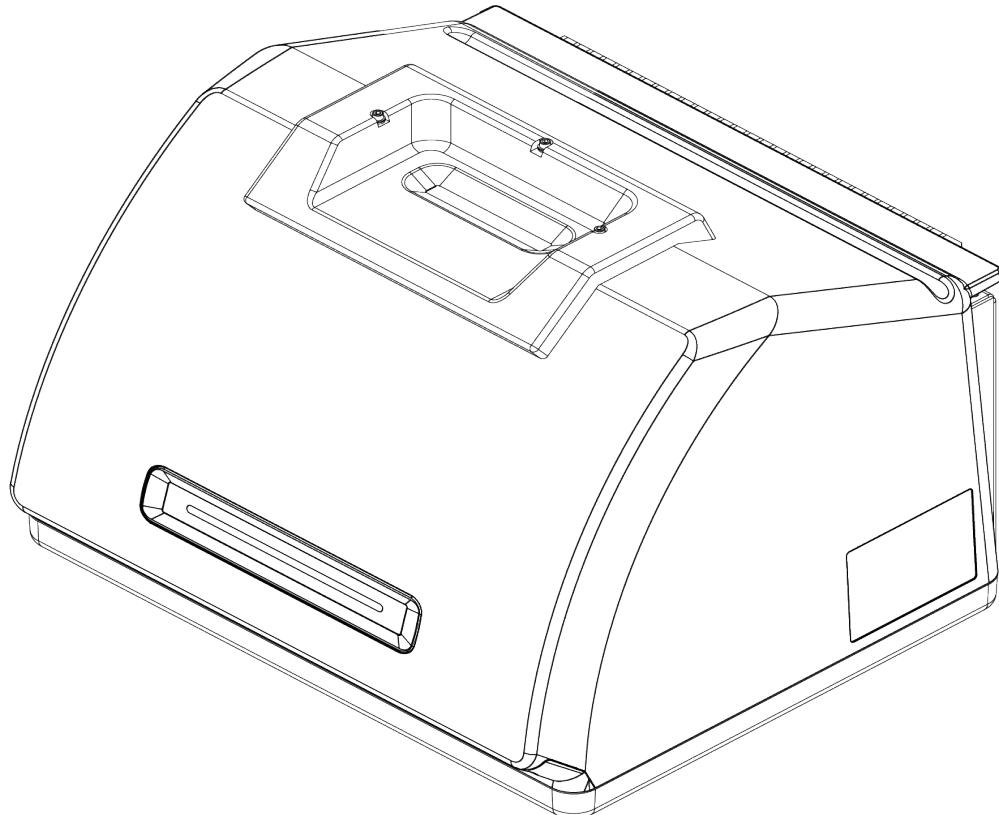


thermo scientific

# Nicolet Summit OA

## FTIR Spectrometer



## USER GUIDE

269-346500

Revision B

April 2021

© 2020 Thermo Fisher Scientific Inc. All rights reserved.

**ThermoFisher**  
SCIENTIFIC

For technical support, please contact: [www.thermofisher.com](http://www.thermofisher.com)

Thermo Fisher Scientific Inc. provides this document to its customers with a product purchase to use in the product operation. This document is copyright protected and any reproduction of the whole or any part of this document is strictly prohibited, except with the written authorization of Thermo Fisher Scientific Inc.

The contents of this document are subject to change without notice. All technical information in this document is for reference purposes only. System configurations and specifications in this document supersede all previous information received by the purchaser.

**Thermo Fisher Scientific Inc. makes no representations that this document is complete, accurate or error-free and assumes no responsibility and will not be liable for any errors, omissions, damage or loss that might result from any use of this document, even if the information in the document is followed properly.**

This document is not part of any sales contract between Thermo Fisher Scientific Inc. and a purchaser. This document shall in no way govern or modify any Terms and Conditions of Sale, which Terms and Conditions of Sale shall govern all conflicting information between the two documents.

**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.

---

# Contents

---

<b>Welcome .....</b>	<b>1</b>
Conventions Used .....	2
Ordering Parts .....	3
Contacting Us .....	3
<b>Get Started with Your Nicolet Summit OA Spectrometer .....</b>	<b>5</b>
Before Your Summit Spectrometer Arrives .....	6
Personal Safety with the Summit Spectrometer .....	9
Unpack and Get Started with the Spectrometer .....	15
Back up and Recover Your Data .....	19
Install a USB Wireless Adapter .....	25
Understand the Spectrometer LightBar .....	27
View Your Data with the OMNIC Anywhere App .....	30
<b>Options and Accessories .....</b>	<b>31</b>
Install and Maintain a Purge Kit .....	32
<b>Maintenance .....</b>	<b>43</b>
Maintenance Schedule for the Summit Spectrometer .....	44
Align the Spectrometer Optics .....	46
Calibrate the Laser Frequency .....	47
Clean the Instrument and Crystal .....	48
Remove and Replace the Crystal Plate .....	50
Replace the Cover .....	52
Replace the Desiccant .....	56
Replace the Source .....	62

# Welcome

The Thermo Scientific Nicolet Summit OA Fourier transform infrared (FTIR) spectrometer lets you perform chemical analyses of sample materials by collecting data in the mid-IR spectral range. The system has integrated verification features, a powerful software suite, and many other features that make data collection easy. You can install optional hardware and perform several service and maintenance procedures yourself. This document, or other provided documentation, contains the information you need.

Be sure to read the safety guide that came with the system before operating the instrument.

**Note** We recommend that you maintain seal and desiccation and/or purge your instrument at all times. Equipment damage due to failure to maintain seal and desiccation and/or purge is not covered by the warranty. If you have questions about this requirement, please contact us.

# Conventions Used

Safety precautions and other important information use the following format:

## DANGER



**Avoid hazard.** Indicates a hazardous situation which, if not avoided, will result in serious injury or death.

## WARNING



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

## CAUTION



**Avoid hazard.** 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.

# Ordering Parts

To order parts, contact us.

If you need to send the instrument or an accessory to us for repair, call or e-mail us first for any shipping requirements or other instructions.

# Contacting Us

For Technical Support, please contact: [www.thermofisher.com](http://www.thermofisher.com)

[This page intentionally left blank]

## Chapter 2

---

# Get Started with Your Nicolet Summit OA Spectrometer

To get started with your new Nicolet Summit OA Spectrometer, review the site and safety requirements before the instrument arrives, unpack and setup the instrument, and connect any additional accessories.

---

Before Your Summit Spectrometer Arrives .....	6
Personal Safety with the Summit Spectrometer .....	9
Unpack and Get Started with the Spectrometer .....	15
Back up and Recover Your Data .....	19
Install a USB Wireless Adapter .....	25
Understand the Spectrometer LightBar .....	27
View Your Data with the OMNIC Anywhere App .....	30

# Before Your Summit Spectrometer Arrives

Prepare a suitable workspace for your spectrometer before it arrives to ensure the most accurate data and the best long-term performance.

This article explains what to do when your spectrometer arrives and introduces environmental and electrical factors that can influence your spectrometer's performance. For a more comprehensive explanation of these requirements, see the Site and Safety Information for the spectrometer.

## Unpacking the Spectrometer

Before you open the box, there are two important steps to take as soon as the instrument arrives:

- Check the exterior of the shipping box for damage

If you notice any signs of damage, contact us or your local distributor for instructions.

- Allow the spectrometer to come to room temperature

Inside the shipping box, the spectrometer is sealed in a plastic bag to keep it dry. **You must allow 24 hours for the spectrometer to reach room temperature before you open the bag.** If you open the bag before the spectrometer is warmed up, condensation could form that could damage internal optical components and cause permanent damage.

The warranty will not cover damage due to improper moving techniques or removing the sealed plastic bag before the instrument has come to room temperature.

## Preparing the Workspace

Before your instrument arrives, make sure your workspace will be able to properly support the spectrometer. In addition to allowing enough room for the spectrometer, consider several environmental and electrical requirements.

## Spectrometer Dimensions

The Summit spectrometer requires a fairly small space, but make sure you also leave room around the instrument so that heat can dissipate from the vents and so that you can easily access the instrument's ports, power , and cables.

- Summit instrument weight: 12.6 Kg (27.8 lbs)
- Dimensions (W x H x D): 34 cm x 24 cm x 32 cm; (13.3 in. x 9.6 in. x 12.7 in.)

## Environmental Factors

The Summit spectrometer is a robust instrument designed to be used in many environments. However, for best performance, keep it in a relatively dust-free and low-humidity environment. The spectrometer operates reliably at temperatures between 15 and 35 °C, but for optimal performance should be kept between 20 and 22 °C.

Humidity can cause condensation to form inside the instrument, which could damage internal components. A few precautions can typically protect your instrument from humidity:

- Maintain the instrument's desiccant, including while the instrument is in storage.
- Avoid rapid changes in temperature.
  - Keep the instrument away from sources of cool or hot air, such as near heating and air conditioning vents or large windows.

If your spectrometer will be kept in an especially humid environment, consider installing a purge gas kit.

## Electrical Requirements

Power supplied to the spectrometer must be from dedicated, uninterrupted sources and free from the following issues:

- Voltage dropouts
- Transient spikes
- Frequency shifts
- Other line disturbances

If you suspect problems with your power, we recommend a power quality audit. Contact us or your local electrical authority for more information.

## Electrical Service Specifications

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

Requirements	Specification
Input Current	1.5 A Max

## Get Started with Your Nicolet Summit OA Spectrometer

Requirements	Specification
<b>Input Voltage</b>	100 to 240 VAC
<b>Line Frequency</b>	50 to 60
<b>Line Disturbances</b>	Sags, surges, or other line disturbances must not exceed 10% of input voltage
<b>Noise</b>	Less than 2 V (common mode) Less than 20 V (normal mode)

# Personal Safety with the Summit Spectrometer

While the Nicolet Summit OA Spectrometer is designed to be a safe instrument, you should take a few precautions to protect yourself from potential hazards that can arise during normal use and maintenance.

## CAUTION



This guide is an introduction to potential dangers that you should be aware of, but it is not a comprehensive guide. Before using the instrument, see the Site and Safety Information for the spectrometer for a full description of these potential hazards.

## Potential Hazards during Normal Use

During normal use, most hazards are due to following sources:

- Potentially hazardous samples and solvents
- Exposure to zinc selenide (ZnSe)
- Parts of the spectrometer that are hot or emit heat
- The instrument's laser

You can avoid possibly harming yourself or damaging the instrument by understanding potential hazards and by taking a few precautions.

## Hazardous Samples and Solvents

Take special precautions if you are using or plan to measure potentially hazardous samples or solvents, such as pressurized gases or corrosive or flammable solvents.

### USE PROPER VENTILATION

There are no special ventilation requirements for your spectrometer, but you may need additional ventilation during certain types of analysis. Ensure that you have proper ventilation if you will be analyzing highly toxic samples, dissolving your samples in solvents that may interact with the infrared source, or sampling flammable gases.

## Get Started with Your Nicolet Summit OA Spectrometer

The pyrolysis of solvents containing halogenated hydrocarbons may produce hydrochloric acid (HCl), hydrofluoric acid (HF), or phosgene (COCl<sub>2</sub>).

### WARNING



**Avoid toxic inhalation.** Hydrochloric acid, hydrofluoric acid, and phosgene are highly toxic. If you are using solvents containing halogenated hydrocarbons, ensure your work area is properly ventilated.

### VOLATILE AND FLAMMABLE SOLVENTS

The infrared source inside the spectrometer can ignite flammable and volatile samples and solvents. Take the following actions when working with samples and solvents that are flammable:

- Work with the sample compartment windows installed.
- Ensure that the workspace is properly ventilated with an active venting system that is free of spark or other sources of ignition and that prevents flammable vapors from collecting in the atmosphere surrounding the instrument.
- Do not leave flammable solvents or samples near the instrument.
- Do not leave flammable solvents or samples in the sample compartment for longer than necessary.
- Purge the spectrometer with clean, dry air or nitrogen.

### CORROSIVE SOLVENTS

Solvents that produce HCl or HF vapors in the sample compartment may severely damage the system. If you are using halogenated solvents, purge the instrument with clean, dry air or nitrogen.

### NOTICE

Your warranty does not cover equipment damage that is due to a failure to purge the instrument.

### BIOHAZARD OR RADIOACTIVE MATERIALS AND INFECTIOUS AGENTS

Biological samples, such as tissues, body fluids, infectious agents, and blood, have the potential to transmit infectious diseases. Follow your organization's Biosafety Program protocols for working with potentially infectious materials.

## Toxic Materials

The Nicolet Summit OA spectrometer includes a zinc selenide (ZnSe) ATR Crystal, and other Summit instruments may use the optional ZnSe sample compartment windows.

### WARNING



**Avoid toxic inhalation and ingestion.**

Zinc selenide (ZnSe) is toxic. Refer to the manufacturer's ZnSe Safety Data Sheet at [www.specac.com](http://www.specac.com) for handling and exposure controls.

## Sources of Heat

Parts of the spectrometer can become quite hot during normal use. Be careful around the spectrometer's infrared source and the vents.

The outward facing surface of the infrared source is located on the bottom of the instrument and can become quite hot. Do not touch the underside of the instrument during operation or shortly after use.

The spectrometer's vent is located on the left side of the instrument. During normal use, the spectrometer dissipates hot air from internal components to the area outside the spectrometer through these vents. Leave enough space around the instrument vents for hot air to dissipate.

## Laser and Optical Safety

You will never be exposed to unsafe levels of laser radiation during normal use of the spectrometer. If the cover is removed during a service procedure, you may need to take special precautions, such as using protective eyewear. Your service person will notify you if this is necessary.

### WARNING



**Avoid personal injury.**

Never stare into the laser beam or at its reflection. Never tamper with the laser, even if you are replacing a defective laser, or you could be exposed to laser light or to high voltage.

## Potential Hazards during Maintenance

You may be exposed to different hazards while performing maintenance on the instrument than you would encounter during normal use. During maintenance, the primary hazards involve purging the instrument and working with the instrument's internal components.

### Purging the Instrument

In especially humid environments, we recommend installing a source of clean, dry air or nitrogen to purge the spectrometer. Purging the instrument can help protect internal optical components from damage caused by a moist environment or corrosive solvents, and it can ensure more accurate results.

See "[Install and Maintain a Purge Kit](#)" for details on purchasing and installing a purge kit for your spectrometer.

#### DANGER

Avoid fire and explosion hazard.



- Use only dried air or nitrogen to purge your spectrometer.
- Never use a flammable, combustible, or toxic gas to purge this instrument. 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 the purge gas.

## Working with Internal Components

Typically, there should be no reason for you to remove the instrument cover or attempt to replace internal components. However, if you need to remove the cover for maintenance, be aware that you risk being shocked, burned, and exposed to laser light.

#### CAUTION

Avoid shock hazard.



Even after this instrument has been disconnected from all voltage sources, capacitors may remain charged for up to 30 seconds and can cause an electrical shock.

### CAUTION



#### Avoid burn hazard.

Internal components, especially the infrared source, can become extremely hot during normal operation. Turn off the instrument and wait at least 10 minutes before replacing any components.

### WARNING



#### Avoid personal injury.

- Never stare into the laser beam or at its reflection. Never tamper with the laser. You could be exposed to laser light or high voltage.
- If you adjust the laser or perform procedures that are not described in the user guides and manuals, you could be exposed to hazardous radiation.

## REPLACING THE DESICCANT

When you open the desiccant compartment, you must prevent flammable liquids or gases from entering the compartment. For instructions on changing the desiccant, see ["Replace the Desiccant"](#).

### DANGER



#### Avoid explosion hazard.

Before you open the desiccant compartment, turn off the instrument power, unplug the power cord and remove samples from the system. Entry of flammable liquids or gases into the desiccant compartment could cause an explosion. If such entry occurs, contact us immediately and do not apply power to the instrument until the condition has been corrected.

## REPLACING THE IR SOURCE

The IR source becomes extremely hot during use. If you need to replace the IR source, avoid burn and explosion hazards.

### CAUTION



#### Avoid burn hazard.

The source becomes extremely hot during normal use. Always allow the source to cool for at least 10 minutes after the spectrometer is turned off before you work with the source.

**DANGER**

Avoid explosion hazard.



Before you remove the source from the spectrometer, turn off the instrument power, unplug the power cord, disconnect any purge lines, and remove samples from the system. Entry of flammable liquids or gases into the source compartment could cause an explosion. If such entry occurs, contact us immediately and do not apply power to the instrument until the condition has been corrected.

## Summary

The Nicolet Summit OA spectrometer is a safe and rugged instrument, but you can be exposed to hazards during use and maintenance. During normal operation, use caution when handling potentially hazardous samples and solvents and avoid parts of the spectrometer that are hot or emit heat. During maintenance, take precautions to avoid harm or damage that could occur when purging the instrument, handling internal components, or changing the desiccant.

# Unpack and Get Started with the Spectrometer

Unpacking and setting up your Thermo Scientific Nicolet Summit OA Spectrometer requires you to place the instrument in your workspace, to connect and power on the spectrometer, and to run a short performance test.

## Before You Begin

### NOTICE

Wait 24 hours before taking the spectrometer out of its plastic shipping bag to prevent condensation from forming that can damage internal optics. The warranty will not cover damage due to opening the sealed plastic bag before the instrument has come to room temperature.

**Reminder:** Review the spectrometer's Site and Safety Information to ensure that the workspace is safe and suitable for the instrument.

## Unpacking and Setup

The steps for unpacking and setting up your spectrometer vary somewhat depending on the options you purchased.

### 1. Unpack the shipping box

Remove the spectrometer from the shipping box and bag and remove additional packing materials.

The spectrometer comes with a removable dust cover over the ATR crystal. Use the dust cover when storing or moving the instrument, and remove it for regular use.

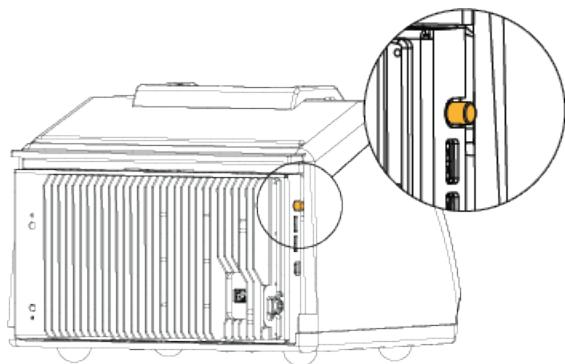
2. Connect the power supply to the spectrometer and to a properly grounded AC power source.
3. Connect the monitor, keyboard, and mouse.
  - a. Connect your monitor to the spectrometer's Mini DisplayPort connection.
  - b. Connect the keyboard and mouse to one of the spectrometer's USB ports.

## Get Started with Your Nicolet Summit OA Spectrometer

**Note** Some USB and Mini DisplayPort devices are known to interfere with the signal from wireless USB devices, such as wireless keyboards and mice. If you notice performance issues with your wireless keyboard and mouse, such as lag or delayed or missed input, use the provided USB extension cable to position the wireless USB receiver farther from the USB ports.

4. Press the instrument's power button to turn on the spectrometer. The spectrometer's LightBar displays a cycling green light while the instrument warms up and shows a solid green bar when the instrument is ready for use.

When you turn the instrument on or off, you may hear the sound of the internal polystyrene reference moving. This is normal.



The first time you turn on the spectrometer, you are prompted to enter a new password. We recommend that you do not enter a password at this time. Proceed without entering a password, then when you have completed setup, manage accounts and passwords on the device according to your organization's policies.

**Note** If the screen is black when you turn the system on, check the monitor power, DisplayPort connection, and the monitor input. See the documentation that came with your monitor for details on changing the input settings.

5. Open OMNIC Paradigm software.

The software may take several minutes to start and to connect to the instrument. The software displays the connection status in the upper right corner of the screen. When the status shows you are connected to the Nicolet Summit OA, proceed to the next step.



## Get Started with Your Nicolet Summit OA Spectrometer

**Note** If you open any menus in the software before the instrument is connected, Align and Calibrate will be disabled. To enable them, when the instrument is connected, click Dashboard in the toolbar.

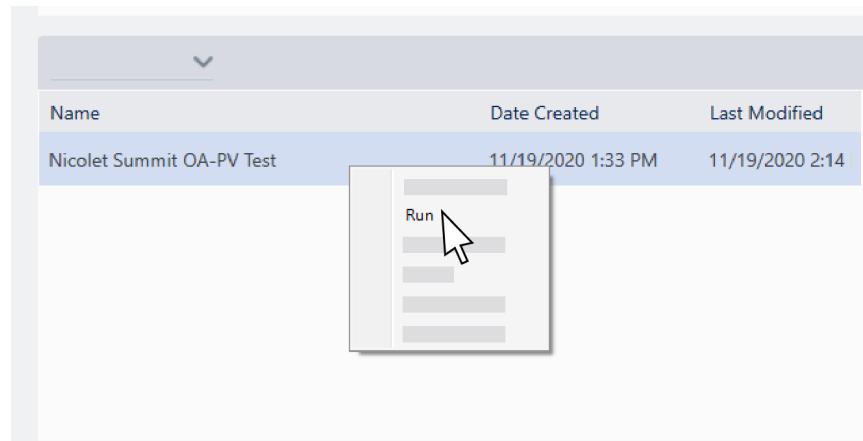
6. Verify the spectrometer's performance.
  - a. Align the spectrometer optics.
    - i. From the Desktop interface, go to **Acquire Data > Diagnostics > Align Spectrometer**.
    - ii. Select **Start** to begin alignment. The screen says "Align complete" when alignment has finished successfully.
  - b. Calibrate the laser.
    - i. Go to the **Acquire Data > Diagnostics > Laser Calibration**.
    - ii. Select **Start** to begin calibration.
    - iii. Laser calibration may take several minutes to complete. When calibration is finished, the display shows "Measurement complete" and indicates any change in laser frequency.

The instrument takes up to 12 hours to come to thermal equilibrium. For best results, re-run alignment and calibration after the first 12 hours of operation.

- c. Run the Nicolet Summit OA - PV Test workflow.

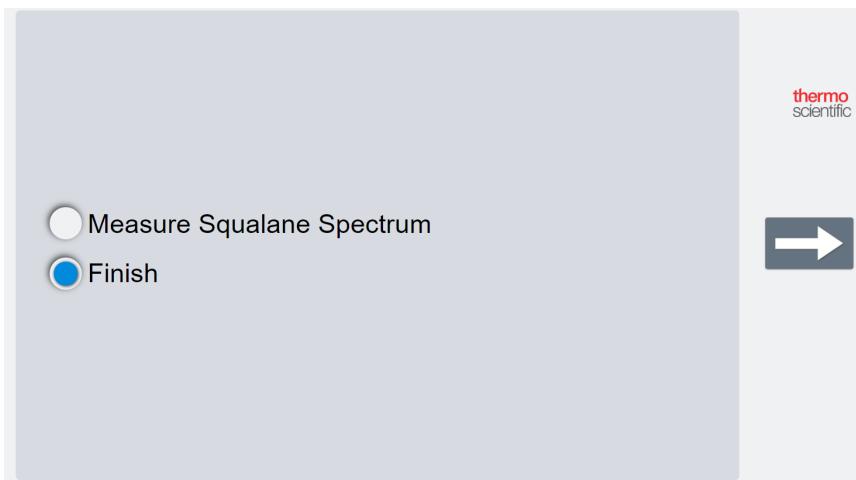
The performance verification workflow uses a reference material to run a series of standard tests to verify your instrument operation and to ensure the accuracy of your data.

- i. From the Dashboard of the Desktop interface, scroll to the Workflows pane.
- ii. In the Workflow pane, right-click the Nicolet Summit OA - PV Workflow and select Run.



## Get Started with Your Nicolet Summit OA Spectrometer

- iii. Follow the on-screen prompts to complete the workflow.
- iv. After the PV Results table is displayed, select Finish to complete the workflow and return to the dashboard or select Measure Squalane Spectrum to proceed to the optional squalane portion of the workflow. Measuring a squalane spectrum provides an additional reference check to verify your system's performance.



## Next Steps

Congratulations! Your instrument is ready for use. However, before you start collecting data, back up your system and create a recovery drive to protect your system from potential problems in the future. Windows 10 includes several built-in tools for backing up and recovering your data.

For instructions on creating a recovery drive and system image and on restoring your system, see ["Back up and Recover Your Data"](#).

For more on identifying and analyzing samples with your spectrometer, see the OMNIC Paradigm guides and tutorials at [thermofisher.com/ftir-help](http://thermofisher.com/ftir-help).

To switch to the Operator interface, go to **View / Display > Operator**.

For detailed instructions on creating and running custom solutions using the Package Editor and the Operator interface, see "Custom Solutions" in the OMNIC Paradigm Software User Guide.

# Back up and Recover Your Data

Before you start collecting data, you should take a few precautionary steps to protect your system from potential problems in the future. Windows 10 includes several built-in tools for backing up and recovering your data.

**IMPORTANT!** To ensure that you can recover any data in the event of damage to the hard drive or operating system, create recovery media, create a system image, and establish procedures for backing up your data.

## Create a Recovery Drive

Create a recovery drive so that you can access advanced startup options in Windows 10—such as System Image Recovery, System Restore, and Startup Settings—even if your installation of Windows becomes damaged.

### Required Materials

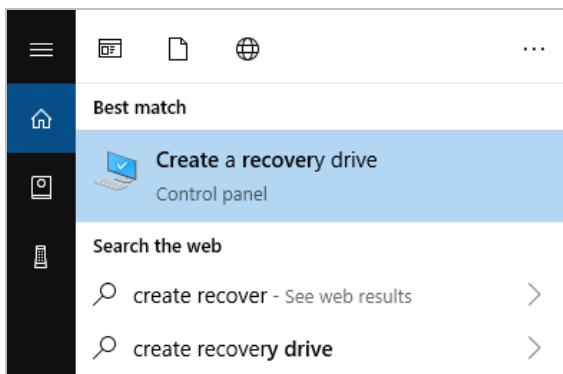
- FAT32 formatted flash drive with at least 8 GB of storage

#### NOTICE

Everything on the drive will be deleted during this process. Before you proceed, make sure you have backed up any files you wish keep.

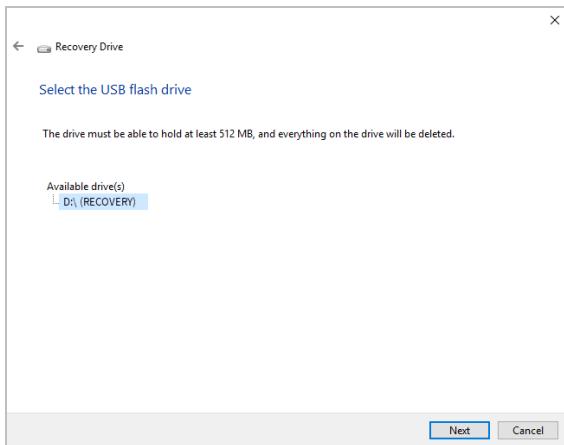
#### ❖ To create a recovery drive

1. Insert the flash drive in one of the USB ports on the side of the spectrometer.
2. In the Windows 10 search box in the taskbar, search for “Create Recovery Drive” and select **Create Recovery Drive**.



## Get Started with Your Nicolet Summit OA Spectrometer

3. When asked to allow changes to your device, select **Yes**.
4. De-select “Back up system files to the recovery drive” and click **Next**.
5. Select your drive from list of available drives and click **Next**.



6. Click **Create**. When the process is finished, click **Finish** to close the window.
7. Safely remove the flash drive and store it in a safe place. It's a good idea to label the drive as Summit Recovery Drive.

For more on creating recovery media, see Microsoft's online help.

## Create a System Image

A system image is a snapshot of your entire system, including your data and files, installed applications, and other settings. In case of complete hard drive or operating system failure, you can use the system image to restore your device to the state it was in when the image was created. It is up to you how often you want to update the system image, but it's a good idea to keep an image of a clean installation from the first time you set up your instrument.

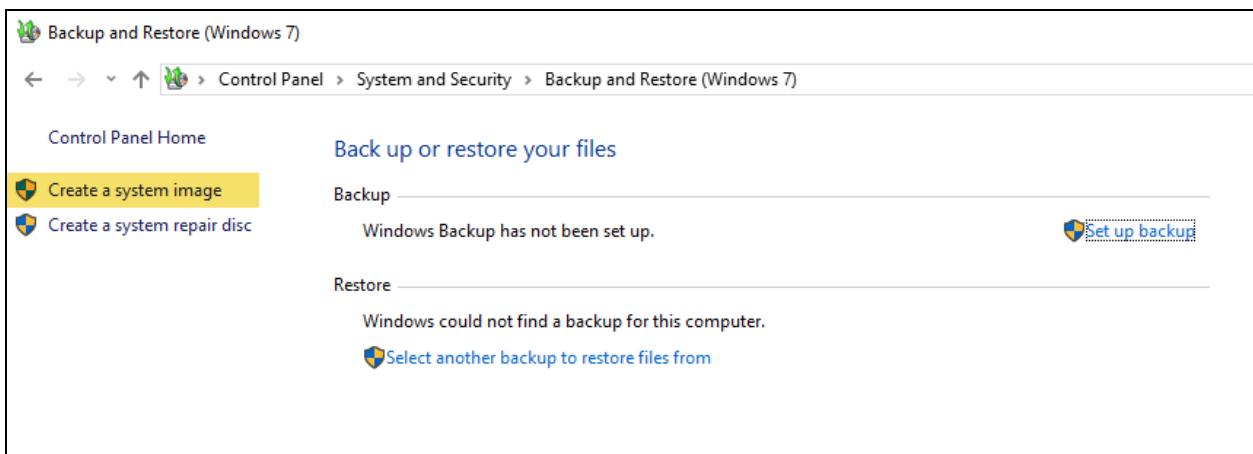
Depending on how much data you copy to the system image, the process may take a while. If you are copying a large amount of data, it may take more than an hour for the process to complete.

### Required Materials

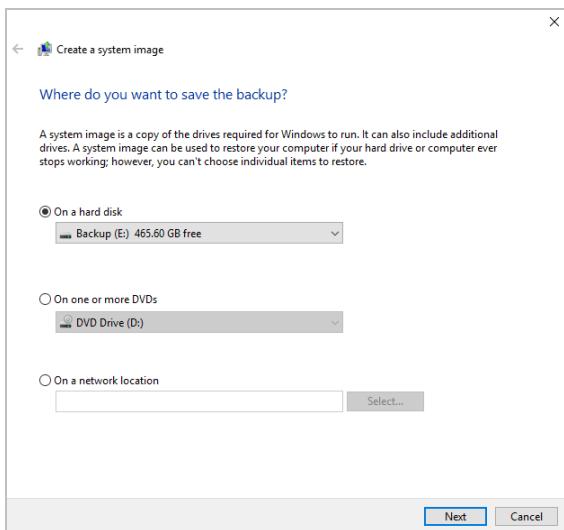
- NTFS formatted SSD
- ❖ **To create a system image**
1. Connect your SSD to one of the spectrometer's USB ports.
  2. In Windows 10, open the Control Panel and select **Backup and Restore (Windows 7)**.

## Get Started with Your Nicolet Summit OA Spectrometer

3. In the left panel, select **Create a system image**.



4. Select **On a hard disk** and select your SSD from the list. Click **Next**.



5. Confirm the backup settings and click **Start backup**.
6. When asked "Do you want to create a system repair disc," click **No**.
7. Click **Close** and safely remove the SSD from the Summit. Label the drive as **Summit Recovery** and store it in safe place.

## Restore Your System

In case of operating system failure, use your recovery drive and system image to restore your system.

### Required materials

## Get Started with Your Nicolet Summit OA Spectrometer

- USB recovery drive
- SSD with your system image

### ❖ To restore your system using the recovery drive and system image

1. Turn off the Summit spectrometer.
2. Connect an external keyboard to one of the Summit spectrometer's USB ports.
3. Connect the USB recovery drive to one of the USB ports.
4. Turn the system on.
5. When the screen shows the Thermo Scientific splash screen, tap “**Esc**” on the keyboard several times to open the system BIOS.

If a popup dialog shows “Quit Without Saving?” use the arrow keys to select No.

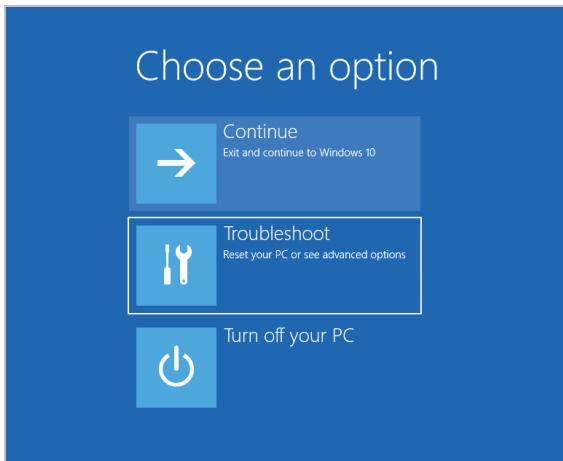
6. Using the arrow keys, navigate to the **Save & Exit** tab.
7. Navigate to the Boot Override section and select your recovery flash drive. Hit **Enter** to boot to the recovery image.



Boot Override  
MMC - TA2864  
Samsung Flash Drive 1100  
Launch EFI Shell from filesystem device

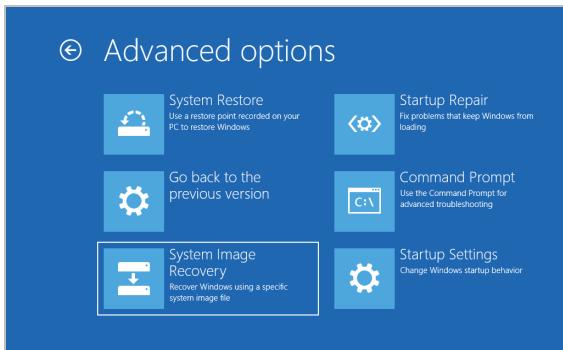
8. When the “Choose your keyboard layout” screen appears, remove the recovery flash drive from the USB port and insert the system image SSD.
9. Select your preferred keyboard layout.
10. In the Choose an Option screen, select **Troubleshoot**.

## Get Started with Your Nicolet Summit OA Spectrometer



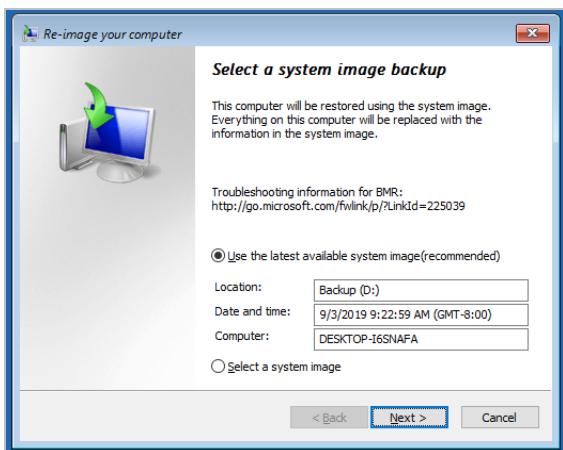
11. Select Advanced options.

12. Under Advanced options, select System Image Recovery.



13. Select Windows 10 as the target operating system.

14. In the “Select a system image backup” window, use the latest available system image or select another system image. Click Next.



## Get Started with Your Nicolet Summit OA Spectrometer

15. Click **Next** to leave additional restore options in their default state, and click **Finish** to restore the system image. Click **Yes** to confirm.

Restoring takes about 15 minutes, and the system will automatically reboot when complete.

When the system is back on, safely remove the SSD from the spectrometer and store both the recovery drive and system image SSD in a safe place.

For information on restoring the system to the image, see Microsoft's online help.

## Back Up Your System Data

In addition to creating recovery media and a system image, you should regularly back up your data. Windows 10 features several options for backing up files, including the File History tool. The information technology (IT) personnel at your organization should determine which backup methods are best for your organization's needs.

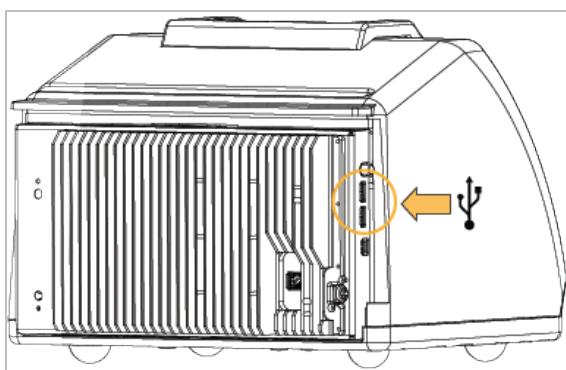
# Install a USB Wireless Adapter

You can connect your Nicolet Summit OA spectrometer to a wireless network using the optional USB wireless adapter. If you purchased the adapter with your spectrometer, it comes preinstalled.

To install the USB wireless adapter, insert the adapter into any USB port. For a more permanent installation, install the adapter in a port under the instrument cover.

## ❖ To install a USB wireless adapter

1. Insert the adapter into any available USB port.



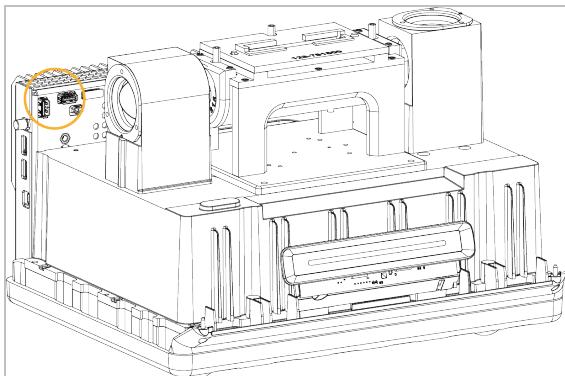
2. The system will recognize the adapter automatically. For information on connecting to a network using your adapter, see support from Microsoft.

## ❖ To install using a USB port under the instrument cover

This installation requires you to remove the crystal plate and instrument cover.

1. Follow the instructions in "[Replace the Cover](#)" to remove the crystal plate and instrument cover.
2. With the cover removed, insert the adapter in either available USB ports.

## Get Started with Your Nicolet Summit OA Spectrometer



3. Replace the instrument cover and crystal plate.

Your instrument is ready to connect to a wireless network.

# Understand the Spectrometer LightBar

The Thermo Scientific Nicolet Summit OA Spectrometer features a convenient LightBar that gives you a quick, visual pass/fail indication of product quality and instrument status at a glance.

The following tables describes all of the LightBar's signals.

## WARMING UP

Signal	System Status	Description
<b>Green Cycle</b> 	System is on and warming up	Green light moves from left to right repeatedly. Warm-up time is approximately 2 minutes.

## TRADITIONAL COLLECTION

Signal	System Status	Description
<b>Solid Green</b> 	Ready for use	The full LightBar displays solid green
<b>Green Comet</b> 	Collecting data	Small section of green light bounces back and forth

## Get Started with Your Nicolet Summit OA Spectrometer

### SMART COLLECTION

Signal	System Status	Description
<b>Blue Pulse</b> 	Collecting Smart Background	Full LightBar pulses blue
<b>Blue Comet</b> 	Collecting sample data (user initiated)	Small section of blue light bounces back and forth

### ANALYSIS RESULTS

Signal	System Status	Description
<b>Green % Fill</b> 	Match value or QCheck result above threshold	Green fill to reflect match value. For example, fills approximately 90% for a match value of 90.
<b>Orange % Fill</b> 	Match value or QCheck result below threshold	Orange fill to reflect match value. For example, fills approximately 30% for a match value of 30.

## Get Started with Your Nicolet Summit OA Spectrometer

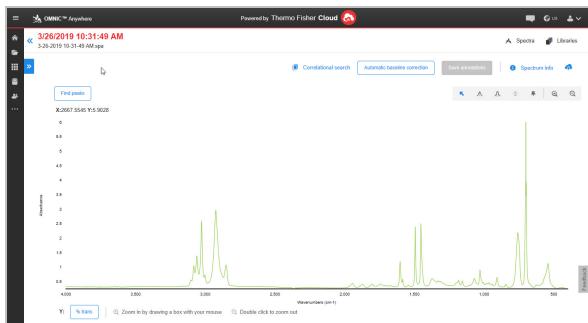
### DIAGNOSTICS

Signal	System Status	Description
<b>Red Flash</b> 	System error	Full LightBar flashes red. See <b>System Status</b> in OMNIC Paradigm software for a description of the error.

# View Your Data with the OMNIC Anywhere App

OMNIC Anywhere is a cloud-based application that allows you to view, explore, or share your data from a connected PC, Apple computer, Android or iOS device.

Figure 1. OMNIC Anywhere in the web browser



With a Nicolet Summit OA spectrometer and a free Connect account, measure samples in the classroom or lab, upload the data to your Connect account, and view, explore, or share the data on another device in your dorm or workspace.

For instructions on creating a Connect account and viewing your data with OMNIC Anywhere, visit ["Cloud-enabled FTIR Spectroscopy"](#).

# Options and Accessories

The Nicolet Summit OA can be used with the optional purge kit.

---

Install and Maintain a Purge Kit .....	32
--	----

# Install and Maintain a Purge Kit

Purging the spectrometer with dry air or nitrogen protects the internal components from moisture and other environmental contaminants. Installing the purge kit requires you to assemble the valves and regulators, replace the desiccant cartridge, connect the purge gas, and set the pressure and flow rate.

## WARNING



### Avoid explosion hazard

Never use a flammable, combustible, or toxic gas to purge this instrument. 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. Use only dried air or nitrogen to purge your instrument.

## NOTICE

We recommend maintaining the seal and desiccating and/or purging the instrument at all times. The warranty does not cover damage caused by a failure to properly desiccate or purge the instrument. If you have questions about this requirement, please contact us.

## SETUP NEEDED

Before installing the purge kit, you will need a source of dry air or nitrogen that meets Thermo Scientific specifications for the Nicolet™ Summit Spectrometer. See the instrument's Site and Safety guide for details.

**Note** For best results, dry the purge gas to a dew point of -70 °C (-94 °F) or below.

## MATERIALS NEEDED

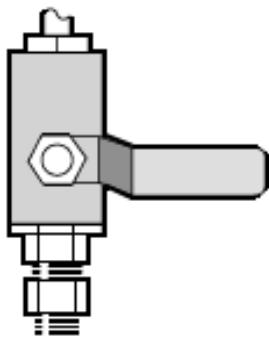
In addition to the purge kit, you will need the following tools and materials:

- 3/4-inch open-ended wrench
- 11/16-inch open-ended wrench
- #2 Phillips head screwdriver
- 3/32-inch hex key
- 7/64-inch hex key
- Thread seal tape ("plumber's tape" or "Teflon tape")

## Options and Accessories

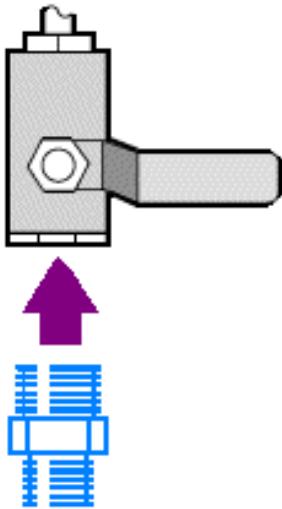
### ❖ To install a purge kit

1. Attach the plumbing assembly to the purge gas source.
  - a. Install the regulator valve and either a 1/4-inch male fitting or a 3/8-inch female fitting on the purge gas source. (Choose a valve and fittings that are appropriate for the purge gas source.)



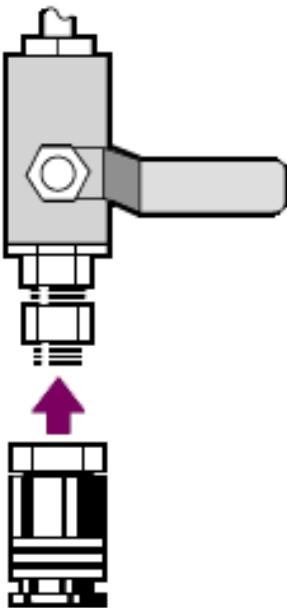
- b. If you used a 1/4-inch male fitting, proceed to the next step.

If you used a 3/8-inch female fitting on the purge gas source, install the 3/8-inch to 1/4-inch reducing nipple that was included with your purge kit. Wrap the reducing nipple with thread seal tape before you install it, and use an 11/16-inch open-ended wrench to tighten the connection.



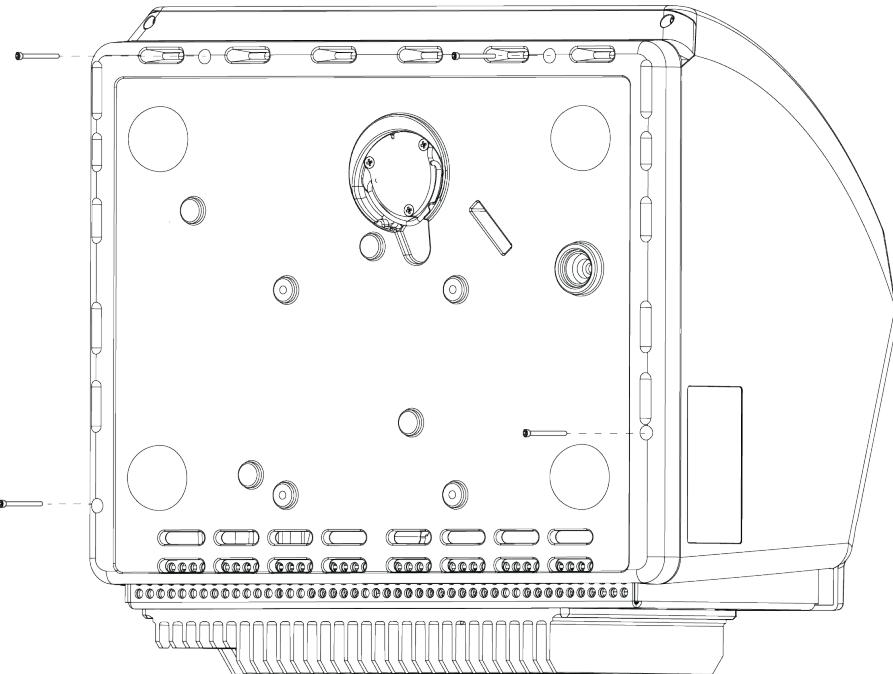
- c. Wrap the reducing nipple or the 1/4-inch male fitting with thread seal tape, and then install the pressure coupling. Use a 3/4-inch open-ended wrench to tighten the connection.

## Options and Accessories

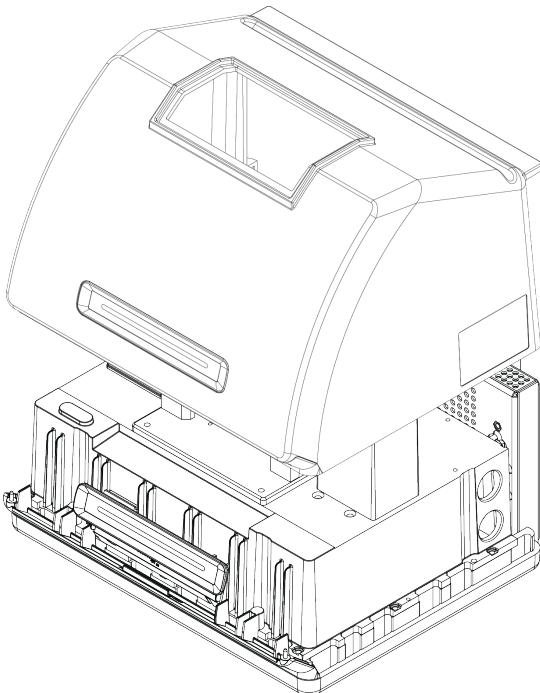


- d. Snap the male inlet of the wall plumbing assembly firmly into the quick release fitting.
2. Turn off the spectrometer.
  - a. To turn off the spectrometer, press the power button.
  - b. Unplug the power cord.
3. ["Remove the crystal plate"](#)
4. Remove the instrument cover.
  - a. Carefully tilt the instrument onto its back so that it rests on the heat fins.
  - b. Using the 7/64 hex key, loosen the four screws fastening the cover to the instrument base.

## Options and Accessories



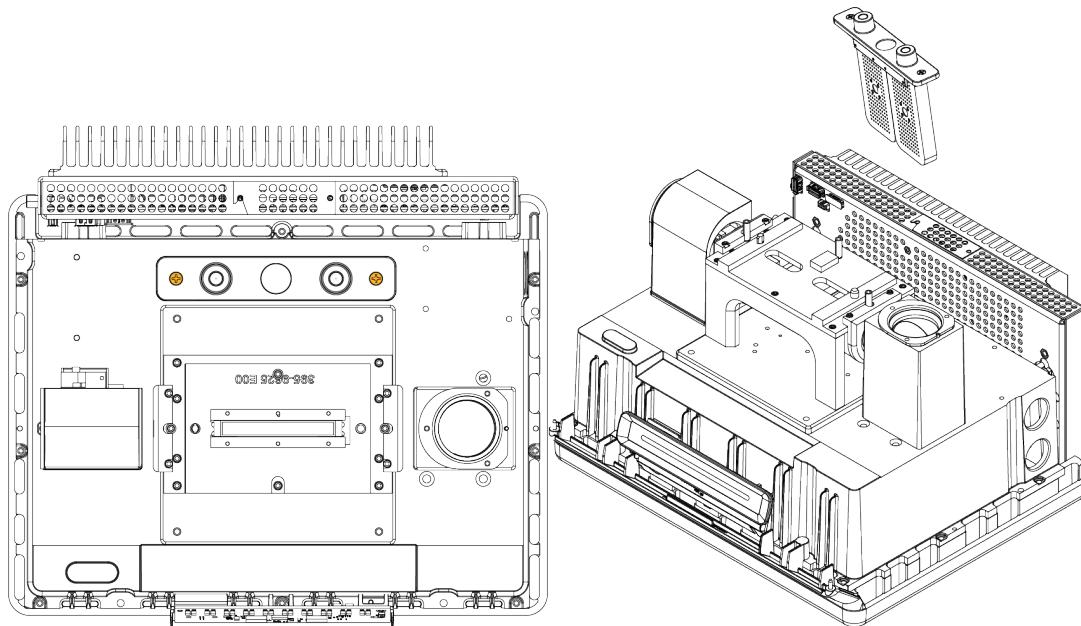
- c. Carefully tip the instrument back onto its feet. When you tip the instrument back up, the four screws will fall out. Be careful not to lose them.
- d. Lift the cover straight up off the base.



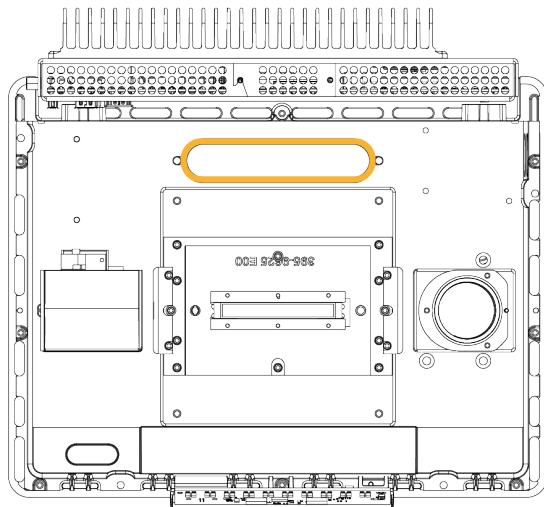
5. Remove the desiccant cartridge.

## Options and Accessories

- a. Use the #2 Phillips head screwdriver to loosen the two captive screws from the desiccant cartridge, and lift the cartridge straight up and out of the instrument.



- b. Remove and discard the large O-ring.



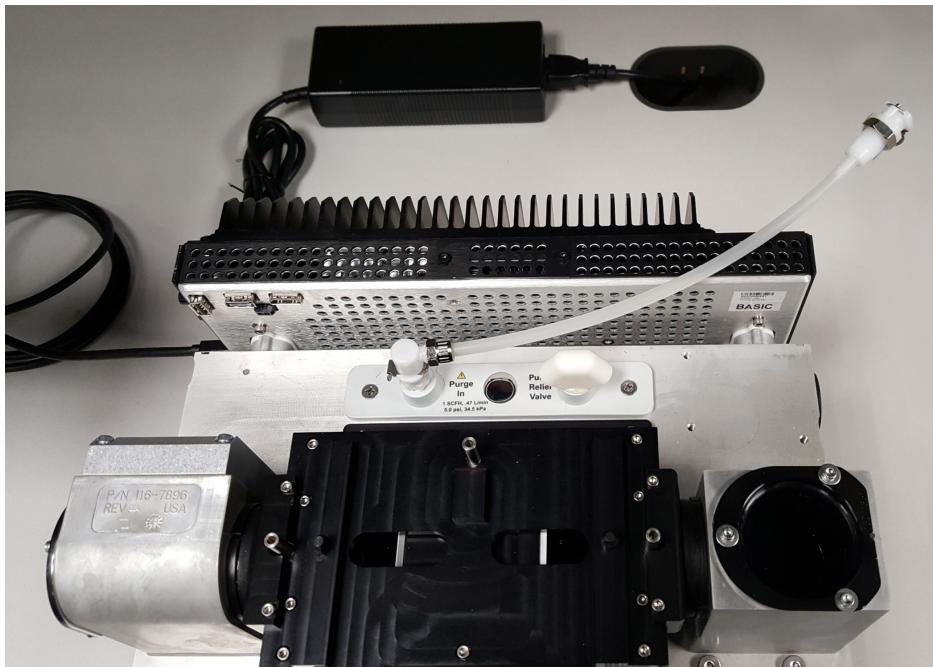
**Note** Be careful to not drop the O-ring into the desiccant compartment.

6. Open the purge kit and the sealed desiccant packet.
7. Remove the O-ring from the packet and install it on the instrument base plate (see previous image). Press (rather than roll) the new O-ring into place to be sure it is properly seated in the groove.

## Options and Accessories

8. Remove the desiccant cartridge with purge fittings from the packet, insert the cartridge in the desiccant compartment, ensure that it is seated properly over the O-ring, and then secure it using the two screws.

Note the correct orientation of the cartridge. You should be able to read the label on the cartridge from the front of the instrument when the cartridge is installed.



9. Route the purge line through the purge inlet opening in the rear of the instrument.

## Options and Accessories

- a. Carefully lower the cover over the base while routing the purge tube into the cover slot.



- b. Lower the cover completely. As the cover is lowered into place, the purge tube is trapped in the slot between the cover and the heat sink.
- c. With the purge tube pushed to the side, tilt the instrument onto its back, resting on the heat fins.
- d. Insert the four screws that you removed previously. Tighten all screws.
- e. Tip the instrument back onto its feet.
- f. Push the excess length of tubing into the instrument, or pull it out as needed.



## Options and Accessories

10. ["Replace the crystal plate".](#)
11. Connect the flow coupler from the wall plumbing assembly (labeled "to spectrometer") to the purge tubing.
12. Set the purge gas controls.
  - a. Open the main regulator valve and set the purge gas controls as indicated below (see Setting the Purge Gas Controls for details).

Hardware	Pressure (psig)	Flow Rate (scfh)
Summit Spectrometer	5	1

- b. Plug in the power cord to the instrument and turn on the power.
- c. Wait 30 - 60 minutes for the instrument to fully purge.

## Set Purge Gas Controls

Correctly setting your purge gas controls will protect your spectrometer from humidity without introducing vibration.

For best results, the purge gas should be dried to a dew point of -70 °C (-94 °F) or below.

### ❖ To set the purge gas controls

1. Open the main valve to start the flow of purge gas through the regulator.
2. Adjust the pressure regulator for the spectrometer until the gauge indicates that the pressure is 5 psig (34 kPa).
3. Set the flowmeter for the spectrometer to 1 scfh (0.47 l/min).
4. **NOTICE**

Flow rates greater than recommended values can cause vibration, which can affect the quality of your data.

## Check and Change the Purge Gas Filter

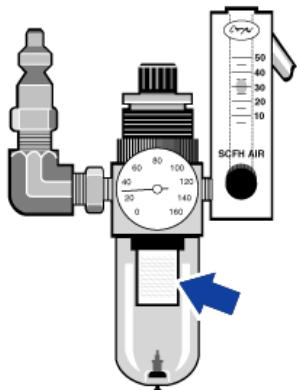
Replace the purge filter when it is yellow, or otherwise discolored, or if it is contaminated with debris or foreign particles.

## Options and Accessories

### NOTICE

We recommend maintaining seal and desiccation and/or purging the instrument at all times. Equipment damage due to failure to maintain seal and desiccation and/or purge is not covered under the warranty. If you have questions about this requirement, please contact us.

**Figure 3-1:** The purge filter is located inside of the plastic bowl below the pressure gauge

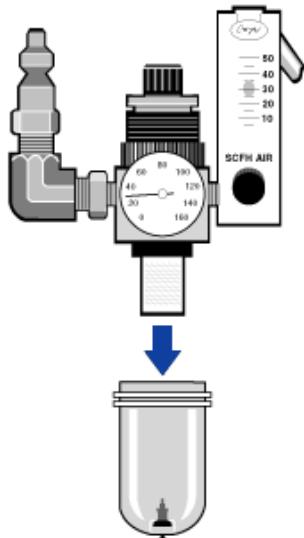


**Note** To order parts, contact Technical Support.

#### ❖ To change the purge gas filter

1. Turn off the purge gas at the main valve. Do not turn down the flowmeter or the pressure regulator.
2. Remove the plastic bowl that houses the filter and then remove the filter. (You can unscrew them both by hand.)

## Options and Accessories



3. Install the new filter and then reinstall the bowl.
4. Open the main valve to turn on the purge flow to the instrument and verify proper purge gas flow rate.

[This page intentionally left blank]

## Chapter 4

---

# Maintenance

Your Nicolet Summit OA FTIR Spectrometer requires little upkeep and no daily maintenance. However, basic care will ensure continued peak performance.

---

<b>Maintenance Schedule for the Summit Spectrometer .....</b>	<b>44</b>
<b>Align the Spectrometer Optics .....</b>	<b>46</b>
<b>Calibrate the Laser Frequency .....</b>	<b>47</b>
<b>Clean the Instrument and Crystal .....</b>	<b>48</b>
<b>Remove and Replace the Crystal Plate .....</b>	<b>50</b>
<b>Replace the Cover .....</b>	<b>52</b>
<b>Replace the Desiccant .....</b>	<b>56</b>
<b>Replace the Source .....</b>	<b>62</b>

# Maintenance Schedule for the Summit Spectrometer

Your Thermo Scientific Nicolet Summit OA FTIR Spectrometer requires little upkeep and no daily maintenance. However, basic care will ensure continued peak performance. Follow the guidelines in this article. For best performance, leave the spectrometer powered on.

## NOTICE

Static electricity can permanently damage critical components in your spectrometer. To help prevent such damage, follow these recommendations:

- Before you disconnect the power supply, discharge any static electricity you may have accumulated by touching the spectrometer's metal base.
- Leave replacement parts in their protective packaging until you are ready to install them in the instrument.

## Weekly Maintenance

### VERIFY THE SPECTROMETER PERFORMANCE

The OMNIC Paradigm software includes a performance verification workflow for your spectrometer. The PV workflow runs a series of standard tests to verify instrument operation and ensure the accuracy of your data.

We recommend that you run the PV workflow at least once a week.

### CLEAN THE SPECTROMETER

The spectrometer can be cleaned only as recommended. See "[Clean the Spectrometer](#)".

## Monthly Maintenance

### CHECK THE HUMIDITY INDICATOR

The spectrometer's optical components can be easily damaged by excessive moisture in the air. The spectrometer is sealed and its components are protected by two desiccant canisters that absorb moisture. Monitor the instrument humidity in OMNIC Paradigm software.

### NOTICE

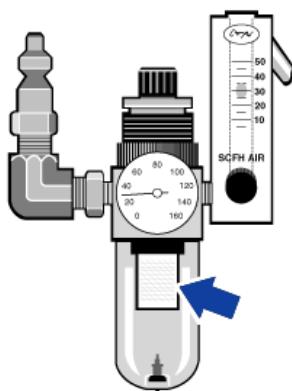
We recommend that you keep the spectrometer sealed and desiccated, or sealed and purged with dry air or nitrogen, at all times. Equipment damage due to failure to maintain seal and desiccation and/or purge is not covered under the warranty. If you have questions about this requirement, please contact us.

#### CHECK THE PURGE GAS FILTER

If your spectrometer is purged with nitrogen or dry air, check the purge filter at least once a month.

Replace the filter when it is yellow, or otherwise discolored, or if it is contaminated with debris or foreign particles. For more information, see ["Check and Change the Purge Gas Filter"](#).

**Figure 4-1:** The purge filter is located inside of the plastic bowl below the pressure gauge



# Align the Spectrometer Optics

Align your spectrometer's optics if the Nicolet Summit OA - PV Test workflow indicates a failing test. Aligning the spectrometer optimizes the energy that reaches the detector and maximizes the detector signal. If the performance test fails, align the spectrometer's optics, calibrate the laser frequency, and run the test again. If the test still fails, contact your local technical support representative for help.

## ❖ To align the spectrometer optics (touchscreen interface)

1. On the home screen, select the Diagnostics icon [  ] to open the diagnostics view.
2. Open the Align tab and select **Align**.

The system automatically aligns the spectrometer and indicates when alignment is complete.

## ❖ To align the spectrometer optics (operator interface)

1. Navigate to the Administrator area, select the Diagnostics icon [  ] to open the diagnostics view.
2. Open the Align tab and select **Align**.

The system automatically aligns the spectrometer and indicates when alignment is complete.

## ❖ To align the spectrometer optics (desktop interface)

1. Select Acquire Data > Diagnostics > Align Spectrometer.
2. In the Align Spectrometer dialog, click **Start**.

The system automatically aligns the spectrometer and indicates when alignment is complete.

# Calibrate the Laser Frequency

Calibrate your laser frequency if the Nicolet Summit OA - PV Test workflow indicates a failing test. When a test fails, first align the spectrometer, then calibrate the laser frequency and run the test again. If the test still fails, contact your local technical support representative for help.

## ❖ To calibrate the laser (touchscreen interface)

1. On the home screen, select the Diagnostics icon [  ] to open the Diagnostics view.
2. Open the Laser Calibration tab and select **Calibrate** to begin.

When laser calibration is complete, a message indicates whether the laser frequency has been changed and displays the new frequency.

## ❖ To calibrate the laser (operator interface)

1. Navigate to the Administrator area, and select the Diagnostics icon [  ] to open the Diagnostics view.
2. Open the Laser Calibration tab and select **Calibrate** to begin.

When laser calibration is complete, a message indicates whether the laser frequency has been changed and displays the new frequency.

## ❖ To calibrate the laser (desktop interface)

1. Select Acquire Data > Diagnostics > Laser Calibration.
2. In the Laser Calibration dialog box, click **Start** to calibrate the laser.

When the system is finished calibrating the laser, a message indicates whether the frequency was changed and displays the new frequency.

# Clean the Instrument and Crystal

Before cleaning the Thermo Scientific Nicolet Summit OA spectrometer, turn it off and disconnect the power supply.

## Clean the Spectrometer

Gently clean the exterior of the instrument with a soft, clean cloth and a mild solvent, such as Windex. Spray the cloth and wipe only the outside, painted surface. Take care to avoid getting solvent on the electronics on the back of the instrument.

Dust can collect on the electronics enclosure on the back of the instrument and can potentially interfere with heat dissipation, which may reduce the lifetime of the electronic components.

To remove dust from the back of the instrument, use compressed air to blow the dust off. Do not use any liquid when removing dust from the back of the spectrometer.

### CAUTION



**Avoid shock hazard.** To avoid shock hazard, do not allow liquid to run into the power supply or the back of the instrument.

### NOTICE

Do not use harsh detergents, solvents, chemicals, or abrasives; these can damage the finish.

## Clean the ATR Crystal Plate

Use a clean, dry, non-abrasive cloth or tissue to clean the ATR Crystal.

### WARNING

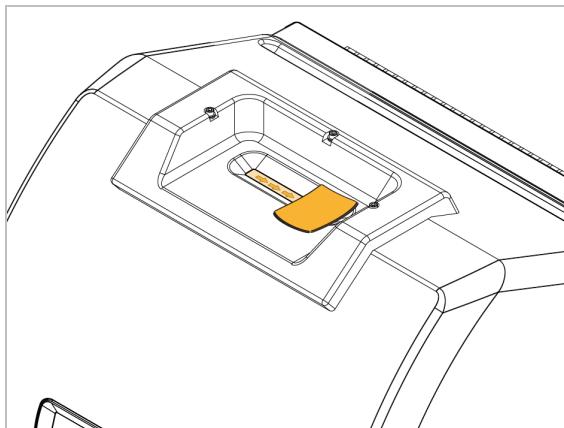


Avoid toxic inhalation and ingestion.

Zinc selenide (ZnSe) is toxic. Refer to the manufacturer's ZnSe Safety Data Sheet at [www.specac.com](http://www.specac.com) for handling and exposure controls.

Wear protective gloves when cleaning or replacing the crystal plate.

1. Using a clean cloth or tissue, blot any liquid off the crystal. Discard the used tissue.
2. With a transfer pipette, apply a few drops of heptane to the crystal and area around the crystal.
3. With a new, clean tissue, wipe along the length of the crystal to clean up any liquids. Wipe the area around the crystal trough.



4. Repeat as needed, always finishing with a clean, dry cloth or tissue.

# Remove and Replace the Crystal Plate

The crystal plate should be replaced every 12 to 18 months or as needed.

## WARNING



Avoid toxic inhalation and ingestion.

Zinc selenide (ZnSe) is toxic. Refer to the manufacturer's ZnSe Safety Data Sheet at [www.specac.com](http://www.specac.com) for handling and exposure controls.

Wear protective gloves when cleaning or replacing the crystal plate.

## NOTICE

Take care to prevent anything from falling into the instrument when the cover is removed.

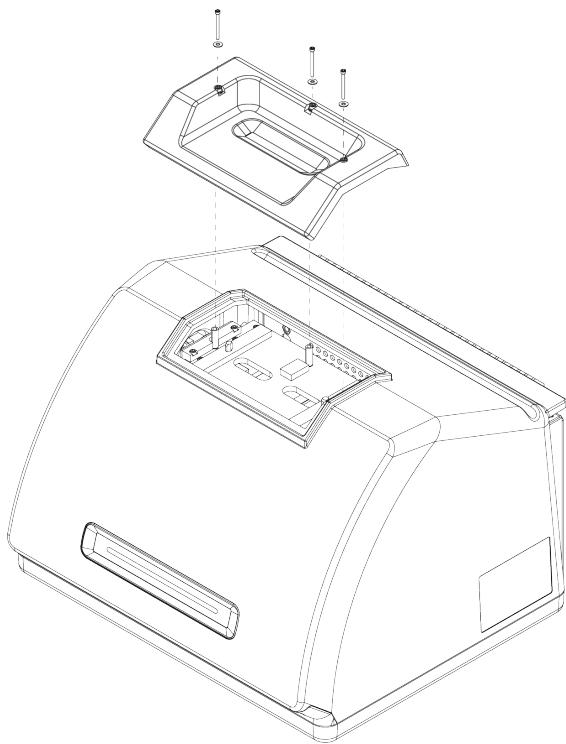
## MATERIALS NEEDED

- 3/32" hex key

## Remove the crystal plate

1. Remove the dust cover from the crystal.
2. Using the 3/32" hex key, completely loosen the three screws holding the crystal plate to the instrument.

## Maintenance



3. Lift the crystal plate straight up off the instrument.
4. Use a clean, dry cloth to clean the area around the flange, under the area the plate sits.

## Replace the crystal plate

1. Set the new plate in position over the flange.
2. Place the washers on the screws, and drop the screws into the three holes. The screws must be straight down in the holes.
3. While pressing down on the crystal plate, tighten the two screws on either side of the plate, then tighten the third screw closest to the back of the instrument. Tighten all screws to be finger tight.

If the screw spins freely, back the screw up and re-insert to correct the alignment.

# Replace the Cover

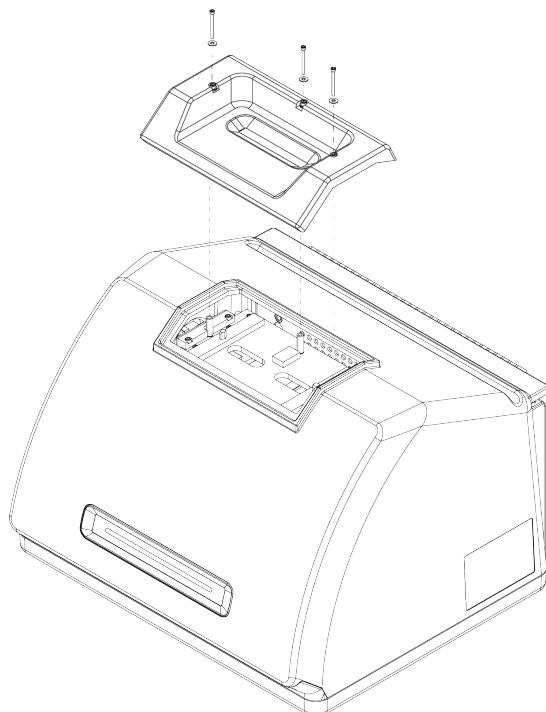
## TOOLS NEEDED

Before you begin, you will need the following:

- 7/64 hex key
- 3/32 hex key

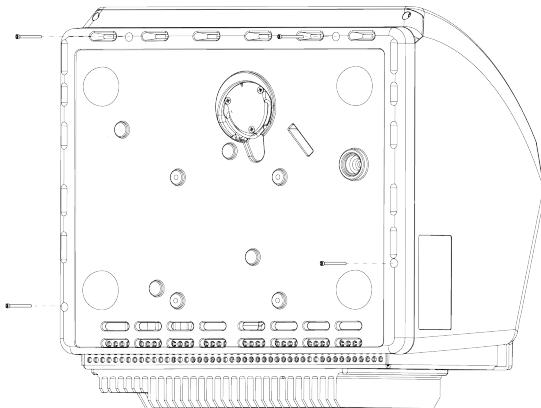
### ❖ To replace the spectrometer cover

1. Turn off the spectrometer.
  - a. To turn off the spectrometer, press the power button.
  - b. Unplug the power cord.
  - c. Turn off the purge, if applicable, and disconnect the purge line to the instrument.
2. Remove the crystal plate.
  - a. Remove the dust cover from the crystal.
  - b. Completely loosen the three screws holding the crystal plate to the instrument.

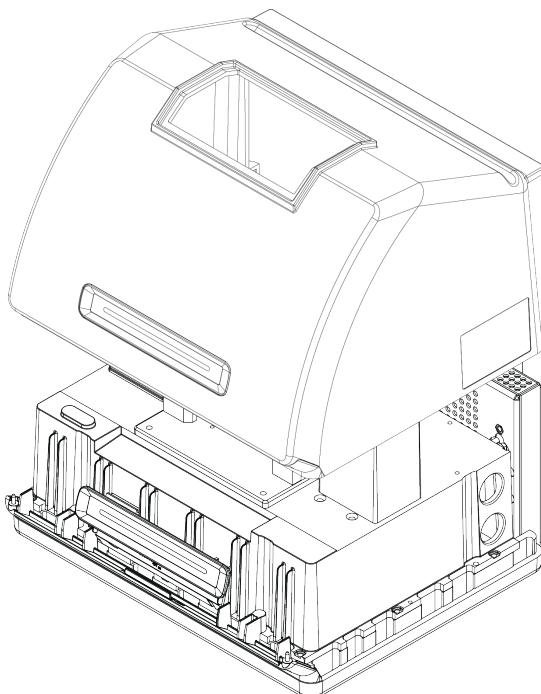


## Maintenance

- c. Lift the crystal plate straight up off the instrument.
  - d. Use a clean, dry cloth to clean the area around the flange, under the area the plate sits.
3. Remove the instrument cover.
    - a. Carefully tilt the instrument onto its back so that it rests on the heat fins.
    - b. Using the 7/64 hex key, loosen the four screws fastening the cover to the instrument base.



- c. Carefully tip the instrument back onto its feet. When you tip the instrument back up, the four screws will fall out. Be careful not to lose them.
- d. Lift the cover straight up off the base.



## Maintenance

4. Replace the instrument cover.
  - a. Carefully set the cover in position on the instrument base.
  - b. Tilt the instrument onto its back, resting on the heat fins.
  - c. Insert the four screws that you removed previously. Tighten all screws.
  - d. Tip the instrument back onto its feet.
5. Replace the crystal plate.
  - a. Set the plate in position over the flange.
  - b. Place the washers on the screws, and drop the screws into the three holes. The screws must be straight down in the holes.
  - c. While pressing down on the crystal plate, tighten the two screws on either side of the plate, then tighten the third screw closest to the back of the instrument. Tighten all screws to be finger tight.

If the screw spins freely, back the screw up and re-insert to correct the alignment.
6. Turn on the spectrometer.
  - a. Plug in the power cord to the instrument and turn on the power.
  - b. Reconnect the purge line to the instrument, if applicable, and turn on the purge.
7. Verify the spectrometer's performance.
  - a. Align the spectrometer optics.
    - i. From the dashboard of OMNIC Paradigm software, go to **Acquire Data > Diagnostics > Align Spectrometer**.
    - ii. Select **Start** to begin alignment. The screen says "Align complete" when alignment has finished successfully.
  - b. Calibrate the laser.
    - i. Go to **Acquire Data > Diagnostics > Laser Calibration**.
    - ii. Select **Start** to begin calibration.

Laser calibration may take several minutes to complete. When calibration is finished, the display shows "Measurement complete" and indicates any change in laser frequency.

## Maintenance

The instrument takes up to 12 hours to come to thermal equilibrium. For best results, re-run alignment and calibration after the first 12 hours of operation.

- c. Run the **Nicolet Summit OA - PV Test** workflow. The performance verification workflow uses reference material to run a series of standard tests to verify your instrument operation and to ensure the accuracy of your data.
  - i. Return to the Dashboard.
  - ii. Scroll to the Workflows pane and select **Nicolet Summit OA - PV Test**.
  - iii. Right click the workflow and select **Run** to start the workflow.

# Replace the Desiccant

Monitor the instrument humidity using OMNIC Paradigm software. Replace the desiccant as needed or according to your organization's policies.

Replacing the desiccant requires you to remove the instrument cover, remove the desiccant cartridge and replace the desiccant canisters and the O-ring.

## TOOLS NEEDED

Before you begin, you will need the following:

- 7/64 hex key
- Desiccant replacement kit
- 3/32 hex key
- #2 Phillips head screwdriver
- Gloves, finger cots, or laboratory tissue (to handle the humidity indicator)

## WARNING

### Avoid explosion hazard.



Before removing the instrument cover and opening the desiccant compartment, turn off the instrument power, unplug the power cord and remove any samples from the system.

Entry of flammable liquids or gases into the desiccant compartment is an explosion hazard. If such entry occurs, contact us immediately and do not apply power to the instrument until the condition has been corrected.

## NOTICE

Make sure nothing falls into the instrument while the desiccant cover is removed.

## WARNING



Replace the desiccant only with replacement parts supplied by us.

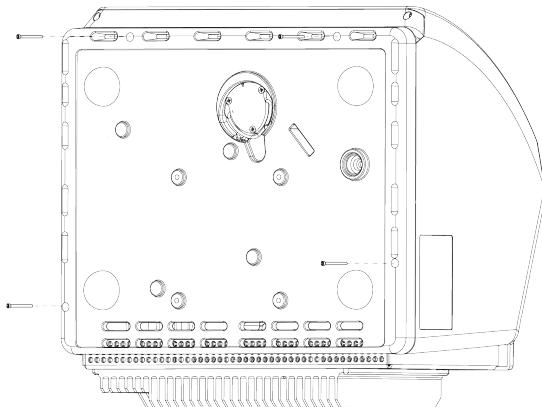
## Maintenance

### ❖ To replace the desiccant

1. Turn off the spectrometer.
  - a. To turn off the spectrometer, press the power button.
  - b. Unplug the power cord.
  - c. Turn off the purge, if applicable, and disconnect the purge line to the instrument.

**Note** You can use either desiccant cartridge (with or without the purge connector) to maintain the required humidity. The illustrations below show the version of the desiccant cartridge that is not purged. The instructions for replacing the desiccant canisters are the same for both cartridges.

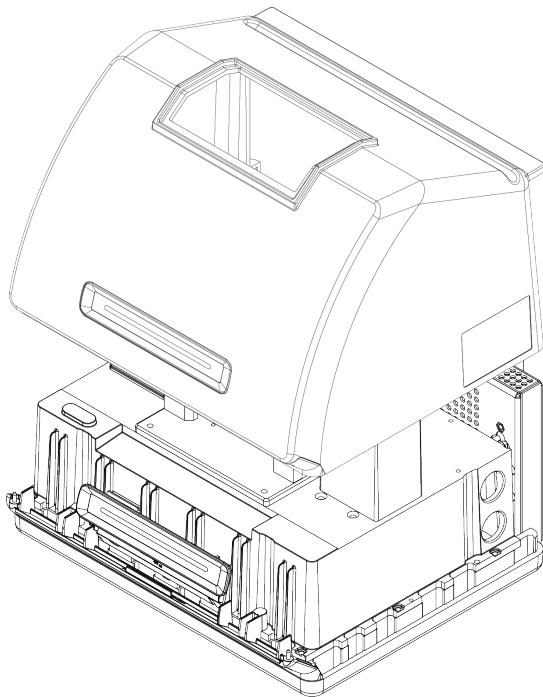
2. "Remove the crystal plate"
3. Remove the instrument cover.
  - a. Carefully tilt the instrument onto its back so that it rests on the heat fins.
  - b. Using the 7/64 hex key, loosen the four screws fastening the cover to the instrument base.



- c. Carefully tip the instrument back onto its feet. When you tip the instrument back up, the four screws will fall out. Be careful not to lose them.

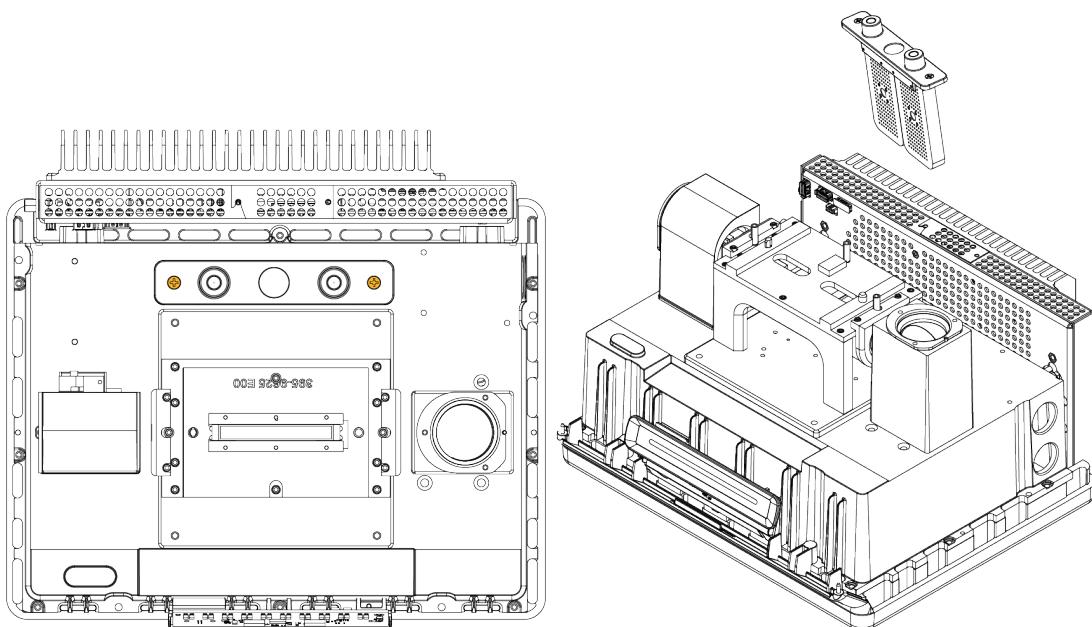
## Maintenance

- d. Lift the cover straight up off the base.



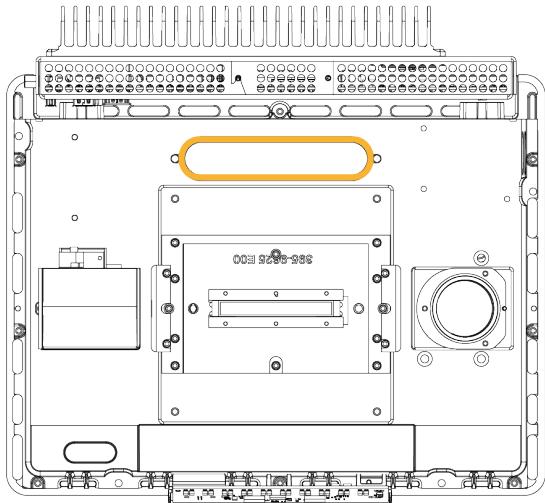
4. Remove the desiccant cartridge.

- a. Use the #2 Phillips head screwdriver to loosen the two captive screws from the desiccant cartridge, and lift the cartridge straight up and out of the instrument.



- b. Remove and discard the large O-ring.

## Maintenance



**Note** Be careful to not drop the O-ring into the desiccant compartment.

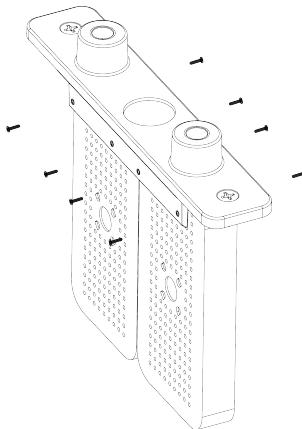
5. Remove the desiccant canisters and replace the humidity indicator.

### WARNING



The contents of the desiccant canisters (hydrated metal aluminosilicate molecular sieve) could be harmful if ingested. If you discard the saturated desiccant canisters, make sure they are properly disposed of.

- a. Use the 0.05-inch hex key to loosen (approximately two turns) the eight screws that hold the two saturated desiccant canisters to the desiccant cartridge. Remove the canisters.



## Maintenance

- b. Turn the desiccant cartridge upside down and peel the old humidity indicator off the window. Discard the used indicator.

### NOTICE

Always wear lab gloves or finger cots, or use laboratory tissue, when handling a new humidity indicator. Oil or moisture from skin can discolor the indicator.

6. Install the new desiccant canisters.

- a. Open the sealed packet that contains the new desiccant (must be sealed to maintain the desiccant) and remove the new humidity indicator.
- b. Turn the desiccant cartridge upside down and press the blue indicator onto the window so that the flat edges of the indicator are aligned with the edges of the cartridge. The text should be visible through the window when you turn the cartridge right side up.

### NOTICE

Make sure that the indicator is pressed tightly against the window so that it does not come loose in the desiccant compartment when you reinstall the cartridge.

- c. Insert the canisters into the channel of the desiccant cartridge and tighten the eight screws (approximately 2 turns) until they are flush with the cartridge channel.

7. Insert the desiccant cartridge.

- a. Remove the new O-ring from the packet and install it on the instrument base plate.

Press, rather than roll, the new O-ring into place to be sure it is properly seated in the groove.

- b. Insert the desiccant cartridge into the spectrometer so that the text on the humidity indicator can be read by someone standing in front of the instrument.

Make sure the cartridge is seated properly over the O-ring and then use the #2 Phillips head screwdriver to tighten the two captive screws.

8. Replace the instrument cover.

- a. Carefully set the cover in position on the instrument base.

- b. Tilt the instrument onto its back, resting on the heat fins.

- c. Insert the four screws that you removed previously. Tighten all screws.

## Maintenance

- d. Tip the instrument back onto its feet.
  - e. [Replace the crystal plate](#).
9. Turn on the spectrometer.
    - a. Plug in the power cord to the instrument and turn on the power.
    - b. Reconnect the purge line to the instrument, if applicable, and turn on the purge.
  10. Verify the spectrometer's performance.
    - a. Align the spectrometer optics.
      - i. From the dashboard of OMNIC Paradigm software, go to **Acquire Data > Diagnostics > Align Spectrometer**.
      - ii. Select **Start** to begin alignment. The screen says "Align complete" when alignment has finished successfully.
    - b. Calibrate the laser.
      - i. Go to **Acquire Data > Diagnostics > Laser Calibration**.
      - ii. Select **Start** to begin calibration.

Laser calibration may take several minutes to complete. When calibration is finished, the display shows "Measurement complete" and indicates any change in laser frequency.
  - The instrument takes up to 12 hours to come to thermal equilibrium. For best results, re-run alignment and calibration after the first 12 hours of operation.
  - c. Run the **Nicolet Summit OA - PV Test** workflow. The performance verification workflow uses reference material to run a series of standard tests to verify your instrument operation and to ensure the accuracy of your data.
    - i. Return to the Dashboard.
    - ii. Scroll to the Workflows pane and select **Nicolet Summit OA - PV Test**.
    - iii. Right click the workflow and select **Run** to start the workflow.

# Replace the Source

The IR source is easily accessible from the bottom of the spectrometer and can be replaced without having to remove the spectrometer's cover.

## TOOLS AND MATERIALS NEEDED

- A #1 Phillips head screwdriver
- Source Replacement Kit

### CAUTION



Before replacing the source, turn off the instrument. Replace the source only with replacement parts supplied by us.

### ❖ To replace the source

1. Turn off and disconnect the spectrometer.
  - a. Turn off the instrument and unplug the power cord.
  - b. Disconnect any cables from the instrument, such as the Ethernet cable or USB devices.
  - c. If the spectrometer is purged, disconnect the purge lines from the spectrometer. See "[Install and Maintain a Purge Kit](#)" for more information.

d.

### CAUTION

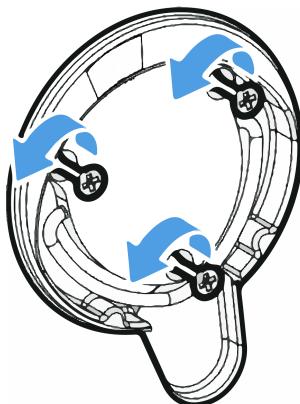


Avoid burn hazard.

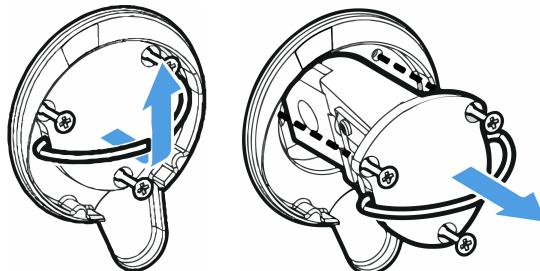
The source becomes extremely hot while you are using the instrument. Wait at least 10 minutes after turning the instrument off before you perform the next step.

## Maintenance

2. Remove the source.
  - a. Use a #1 Phillips head screwdriver to fully loosen the three captive screws that hold the source in place.



- b. Swing the bale out. Steady the instrument with one hand and pull firmly on the bale to pull the source straight out of the instrument.



### NOTICE

Never touch a source element with your bare fingers. Skin oils or other deposits on the element will shorten its life. Always use clean finger cots, gloves, or clean laboratory tissue when handling a source element.

3. Insert the new source.
  - a. Make sure the three captive screws are straight and then slowly insert the source into the cavity until the source mount is flush with the instrument.
  - b. Tighten the screws to secure the source and snap the bale into its storage position.
4. Reconnect and power on the spectrometer.
  - a. Carefully return the instrument to its upright position and reconnect any cables you removed.
  - b. Replace the desiccant. See "Replace the Desiccant" for instructions.

## Maintenance

Because the internal optics are exposed to the atmosphere when removing the source, the desiccant should always be replaced after replacing the source.

### WARNING



#### Avoid shock hazard.

To ensure 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 noncurrent-carrying wire connected to earth ground at the main distribution box.

- c. Plug in the power cord to the instrument and press the power button to turn on the spectrometer.
5. Verify the spectrometer's performance.
  - a. Align the spectrometer optics.
    - i. From the dashboard of OMNIC Paradigm software, go to **Acquire Data > Diagnostics > Align Spectrometer**.
    - ii. Select **Start** to begin alignment. The screen says "Align complete" when alignment has finished successfully.
  - b. Calibrate the laser.
    - i. Go to **Acquire Data > Diagnostics > Laser Calibration**.
    - ii. Select **Start** to begin calibration.

Laser calibration may take several minutes to complete. When calibration is finished, the display shows "Measurement complete" and indicates any change in laser frequency.
  - The instrument takes up to 12 hours to come to thermal equilibrium. For best results, re-run alignment and calibration after the first 12 hours of operation.
  - c. Run the **Nicolet Summit OA - PV Test** workflow. The performance verification workflow uses reference material to run a series of standard tests to verify your instrument operation and to ensure the accuracy of your data.
    - i. Return to the Dashboard.
    - ii. Scroll to the Workflows pane and select **Nicolet Summit OA - PV Test**.
    - iii. Right click the workflow and select **Run** to start the workflow.