

Agilent 4300 Handheld FTIR

Instrument Stand and Accessories Assembly and Use Instructions



Figure 1 Agilent 4300 Handheld FTIR stand with downward facing stage with diffuse reflectance sampling interface (left) and upward facing stage and ATR sample press (right) installed

This procedure outlines the steps to use the instrument stand (G8180-68010) with the supplied diffuse reflectance sampling interface and how to install optional accessories for the Agilent 4300 Handheld FTIR to make sampling more efficient in the laboratory.

Available accessories

- The instrument stand for the 4300 Handheld FTIR system comes configured with the diffuse reflectance sampling interface in the downward facing position as standard. See Page 2.
- The optional ATR sample press is installed on an upwards facing reflectance stage unique for the ATR. It enables improved measurement of solid or powder samples by ensuring that the sample is in good contact with the diamond or germanium (Ge) ATR sample interface. See Page 4.
- External reflectance and grazing angle sample interfaces installed on the 4300 Handheld FTIR are each used with unique upwards facing reflectance stages. See Page 7.

About the 4300 Handheld FTIR stand

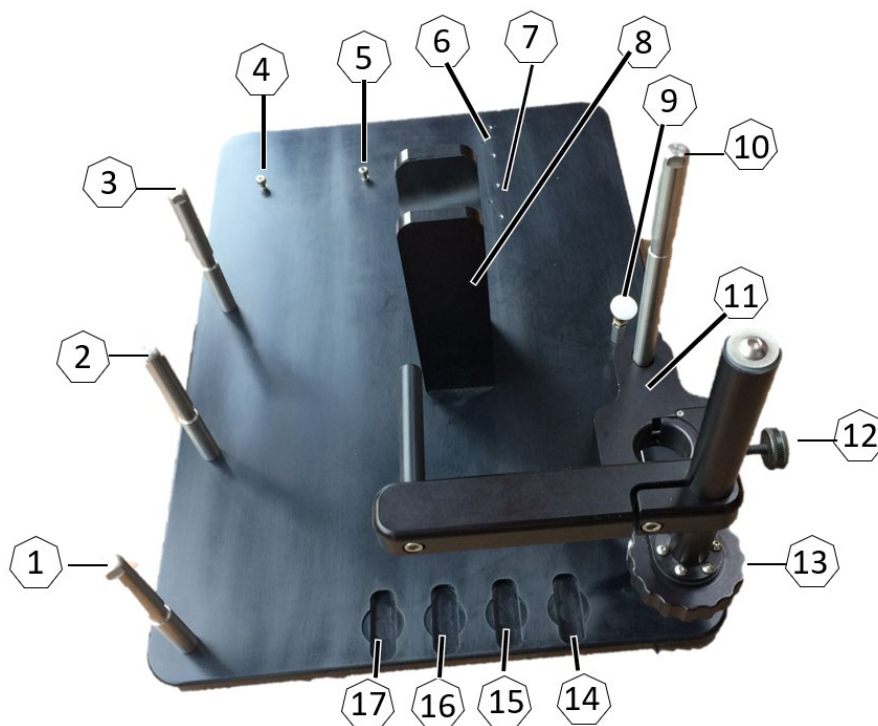


Figure 2 Agilent 4300 Handheld FTIR stand overview

Table 1 Agilent 4300 Handheld FTIR stand components

Component Descriptions					
1-3	Stage poles	4-5	Battery charger standoff	6-7	ATR clamp, 3 holes
8	FTIR Instrument arm rest	9	Pivot rest for rear of FTIR	10	Diffuse sampling stage guide
11	Diffuse sampling stage	12	Locking screw for diffuse sampling interface. Locking screws are unique to each stage type.	13	Fine and coarse vertical adjuster
14-17	Background sample holders				

Using the instrument stand with the diffuse sampling interface

Installing the diffuse sampling interface

- 1 Clean the sample interface and the sampling tube before use. See Page 3 for cleaning instructions.
- 2 Remove the reference cap from the sample interface.
- 3 Place the 4300 Handheld FTIR into the stand with the sample interface facing downward (Figure 3).



Figure 3 Placing the instrument on the stand

- 4 Ensure that the handle of the instrument rests on the side arm of the holder and the opening of the sampling interface is horizontally aligned.
- 5 Secure the instrument by tightening the locking screw on the front of the stage (Figure 4).



Figure 4 Tightening the locking screw

- 6 Move the stage up and down by either turning the focus alignment wheel for fine adjustment, or by pressing the button to on the wheel for course movement (Figure 5).



Figure 5 The focus alignment wheel

CAUTION

Care must be taken to support the weight of the instrument when adjusting the height of the instrument with the coarse movement. Not doing so may cause the stage to drop, damaging the instrument.

Cleaning the diffuse sampling interface

To clean the diffuse sampling interface in preparation for analysis:

- 1 Remove the 4300 Handheld FTIR from the stand following Steps 1 and 2 in the instructions on Page 4.
- 2 Clean the diffuse sampling interface using an extra-low lint, non-abrasive wipe lightly dampened with a suitable solvent, such as acetone, methanol, ethanol or isopropyl alcohol.

CAUTION Do not allow liquid or dust to enter the sampling accessory.

- 3 Place the FTIR on the FTIR stand.

Removing the 4300 Handheld FTIR and diffuse sampling interface

- 1 Loosen the locking screw on the stage.
- 2 Lift the instrument from the stand.
- 3 Remove the diffuse sampling interface from the 4300 Handheld FTIR. See the 4300 Handheld FTIR User's Guide for removal and storage instructions.

Measuring a sample with the diffuse sampling interface

IMPORTANT For background measurements, a coarse silver reference sample for the diffuse reflectance interface is available: G8181-67007.

See 'Measuring samples with all accessories' on Page 9.

For detailed software instructions on measuring samples, reviewing results and handling sample data, refer to the MicroLab Software Operation Manual.

About the ATR sample press

The press is designed to deliver 11.4 kg (25 lb) of force, or over 17 MPa (2500 psi) of pressure to the sample. It is not for use with liquids, gels or pastes. See Page 7 for more information on ensuring strong contact with samples.

A lower pressure device is available with the germanium (Ge) ATR and its stage.

CAUTION The higher pressure diamond ATR press should never be used with the Ge ATR as the higher pressure will damage the Ge crystal.

If measurements of liquids, gels or pastes are required with the ATR sample press attached to the stage, tilt the sample press up to prevent contact between the liquid, gel or paste and the ATR sample press tip.

IMPORTANT The ATR sample press requires the use of the instrument stand.

Installing the optional ATR stage and ATR sample press

There are two steps to set up the ATR for use:

- Install the ATR stage
- Install the ATR sample press

Installing the ATR stage

- 1 Clean the ATR sample interface and the stainless-steel sampling tube before use. See Page 6 for instructions on cleaning.
- 2 Remove the reference cap from the sample interface.

- 3 Place the 4300 Handheld FTIR in the stand with the sample interface pointing up.
- 4 Slide the ATR stage down the support rod with the opening positioned above the sample interface until it clicks into place (Figure 6).

CAUTION

Do not press down on the stage. Doing so may damage the sample interface.



Figure 6 4300 Handheld FTIR mounted on the stand and sliding the ATR stage down the support rod

- 5 When the stage clicks into place over the ATR sample interface, tighten the locking screw on the support rod to lock the stage (Figure 7).



Figure 7 Locking the ATR stage

Installing the ATR sample press

CAUTION

Installation of the ATR sample press with the press arm in the downward position can damage the diamond or Ge sample interface. Always install the press in the open position. See Figure 8 on Page 6.

Do not use the ATR sample press in the downward position when measuring liquids.

- 6 Ensure that the ATR sample press is in the open or tilt back position.

- 7 Place the ATR sample press onto the stage.
- 8 Screw in the two thumb screws. (Figure 8).

IMPORTANT

The ATR sample press has a tilt back feature that allows you to move the press out of the way when measuring liquid samples, when installing the ATR sample press, and when cleaning the ATR surface.

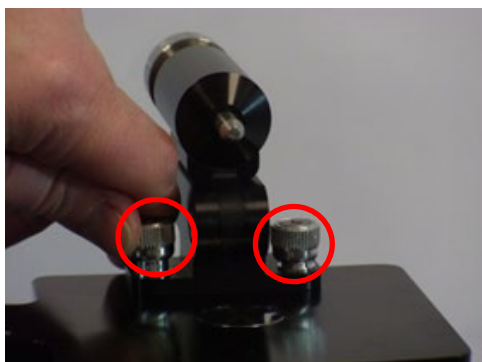


Figure 8 Installing the ATR stage and ATR sample press

Once the ATR sample press is installed, the instrument can be used as a standard ATR with pressure configuration.

Cleaning the ATR stage, ATR sample interface crystal and ATR sample press tip

To clean the ATR stage in preparation for analysis:

- 1 Move the ATR sample press to the open position.
- 2 Clean the ATR stage using an extra-low lint, non-abrasive wipe and a suitable solvent, such as acetone, methanol, ethanol or isopropyl alcohol.
- 3 Clean the ATR sample interface crystal using an extra-low lint, non-abrasive wipe dampened with a suitable solvent, such as acetone, methanol, ethanol or isopropyl alcohol.
- 4 Clean the tip of the ATR sample press with a non-abrasive wipe dampened with a suitable solvent, such as acetone, methanol, ethanol or isopropyl alcohol.

Removing the ATR stage and ATR sample press

The stage, including the attached ATR sample press, can be removed from the instrument stand. To do this:

- 5 Tilt the sample press arm back so that the press tip is not in contact with the diamond or Ge sample surface.
- 1 Optional: Unscrew the two screws to remove the ATR sample press.
- 2 Loosen the locking screw on the support rod. See Figure 7.
- 3 Simultaneously lift the platform and press the push button (Figure 9) to release the stage.

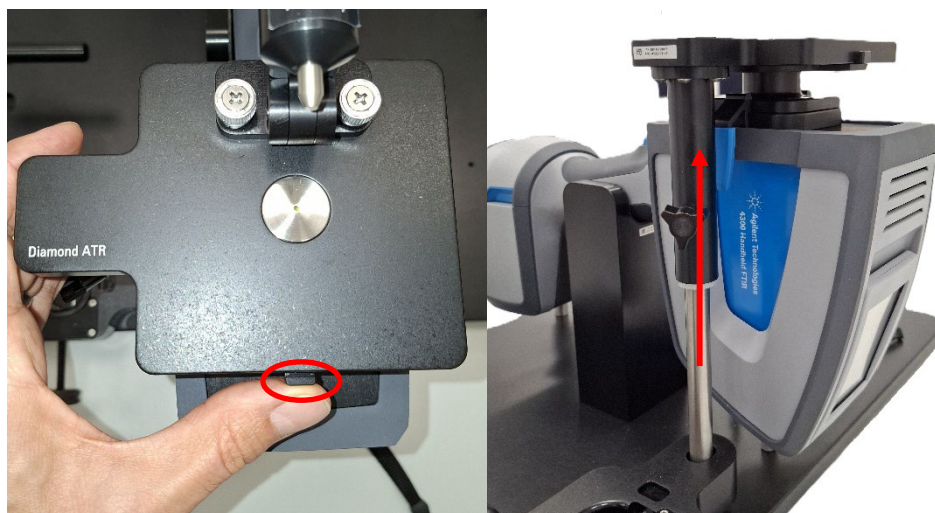


Figure 9 Removing the ATR stage

Ensuring sample contact

For different sample types, different methods may need to be used to ensure good contact between the sample and the sample interface. Refer to the table below for different sample use cases.

Table 2 Sample usage table

Sample type	Sample contact type
Liquid samples	Small samples can be measured by placing a drop of sample on the center of the diamond or Ge interface. The ATR sample press must be in the open position for liquid samples.
Solid samples	Place an appropriate amount of sample to cover the ATR crystal. To ensure good contact between the sample and the ATR crystal, tighten the knob on the ATR sample press to press it against the ATR sample interface crystal.
Thin films	To measure thin polymer films, proper contact between the polymer film and the crystal surface must be ensured. This requires the use of the ATR sample press and, in the case of very thin films, possibly an intermediate layer like the ATR shims.

In all cases, ensure that the sample covers the entire surface area of the diamond or Ge crystal.

Measuring a sample with the ATR sample press

See '[Measuring samples with all accessories](#)' on Page 9.

For detailed software instructions on measuring samples, reviewing results and handling sample data, refer to the MicroLab Software Operation Manual.

Using the instrument stand with upward facing reflectance stages

The instrument stand for the 4300 Handheld FTIR system is offered with optional stages for external reflectance and grazing angle sample interfaces. The stages are specific to the sample interfaces and are labeled accordingly.

IMPORTANT

The External Reflectance Stage is provided with an External Reflectance Reference sample. The Grazing Angle Stage is provided with a Gold Grazing Angle Reference sample.

Installing the upward facing reflectance stages

- 1 Clean the sample interface and the sampling tube before use. See Page 8 for cleaning instructions.
- 2 Remove the reference cap from the sample interface.
- 3 Install the sampling interface on the 4300 Handheld FTIR. See the 4300 Handheld FTIR User's Guide for instructions.
- 4 Place the instrument in the stand with the sample interface facing upwards (Figure 10).



Figure 10 Installing the instrument in the stand

- 5 Slide the upward facing reflectance stage down the support rod with the opening positioned above the sample interface until it clicks into place (Figure 10).

CAUTION

Do not press down on the stage. Doing so may damage the sample interface.

- 6 When the stage clicks into place over the sample interface, tighten the screw on the support rod to lock the stage (Figure 11).



Figure 11 Stage screw mechanism

Cleaning the upward facing reflectance stage

Removing the stage is not required for cleaning.

Clean the upward facing reflectance stage in preparation for analysis using an extra-low lint, non-abrasive wipe lightly dampened with a suitable solvent, such as acetone, methanol, ethanol or isopropyl alcohol.

CAUTION

Do not allow liquid or dust to enter the sampling accessory.

Removing the upward facing reflectance stage

- 1 Loosen the locking screw on the support rod.
- 2 Simultaneously lift the platform and press the button (Figure 9) to release the stage.

Measuring a sample with the upward facing reflectance stage

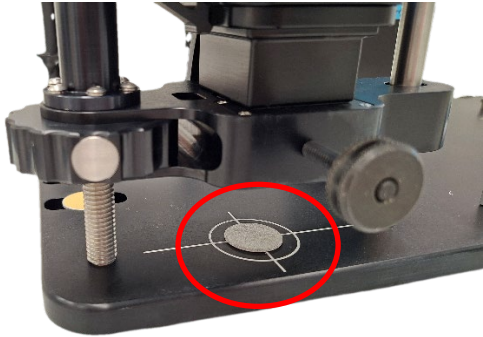

See 'Measuring samples with all accessories' on Page 9.

For detailed software instructions on measuring samples, reviewing results and handling sample data, refer to the MicroLab Software Operation Manual.

Measuring samples with all accessories

Follow the steps below to perform a measurement with your accessory. Unless specified otherwise, the steps are the same for all configurations.

- 1 Click **Methods** on the home screen of the software
- 2 Choose a method and press **Activate**.
- 3 Click **Start** on the home screen.
- 4 **For the ATR stage and sample press:** Skip to Step 7.
For the diffuse reflectance, external reflectance and grazing angle accessories: When prompted, place the reference sample in the location.

Accessory	Reference material	Location
Diffuse stage	G8181-67007_Coarse Silver Ref. Sample Spare Part (provided with the stage)	Target area on stand 
External reflectance	200-0489_316SS Reference Sample 2.6RMS or 100-0108_Ext Reflectance Ref Sample (provided with the stage)	Top of stage over the sampling accessory 
Grazing angle	Gold Grazing Angle Reference (provided with the stage)	Top of stage over the sampling accessory See image above for location.

- 5 When prompted, clean the crystal and then click **Next**.
- 6 The 4300 Handheld FTIR will automatically check the crystal and then collect the background spectrum.

- When complete, click **Next**. The software will prompt you to ensure contact with the sample.

For the diffuse reflectance, external reflectance and grazing angle accessories: See Step 6 for sample locations.

For the ATR stage and sample press: Place a small amount of the material to be measured onto the ATR sample interface crystal.



Figure 12 Diamond or Ge ATR crystal location

- Enter the Sample ID and then use the live view graph to observe the sample signal to ensure good contact between the sample and the sample interface. See the MicroLab Software Operation Manual for more information.
- When the maximum signal is confirmed, click **NEXT** to start the analysis.
- Click **Done** when the sample measurement finishes to continue with further measurements.
- Immediately clean the sample from the accessory. See Page 6. It is important to ensure the sample interface crystal is free of any residue from the previous sample.

For detailed software instructions on measuring samples, reviewing results and handling sample data, refer to the MicroLab Software Operation Manual.

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