Raman Microscope Light-Proof Enclosure

This leaflet describes how to fit the Raman Microscope Light-Proof Enclosure. The enclosure has been designed for use with a RamanMicro 200 or RamanMicro 300 microscope, and is intended for use under the same environmental conditions.

Figure 1 Raman Microscope Light-Proof Enclosure fitted to the RamanMicro 300

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Produced in the UK.

Purpose of the Enclosure

The principle function of the enclosure is to provide a safe (Class 1) environment for the use of an instrument which utilizes a Class 3B laser source. When the doors of the enclosure are closed, it is light-proof and interlock sensors ensure that the microscope cannot be used when the doors are open.

NOTE: The enclosure does NOT provide a reclassification of the Raman system to a Class 1 instrument. It simply provides a closed environment in which the microscope can be used safely.

In addition the enclosure also prevents external light interfering with the quality of your measurements.

Finally, the enclosure provides a physical barrier: helping to prevent accidental contact, by the operator, with samples and accessories.

Before you Start

Before you begin the installation you should:

- Check that all the component parts of the enclosure assembly have been supplied and that they have not suffered any damage in transit. If any damage has been sustained to any of the parts, contact your PerkinElmer Service Engineer.
- Have to-hand all the tools required to carry out the installation.
- Prepare the microscope. See *Preparing the microscope* on page 3 for details.
- Please ensure that you have read and fully understand the safety warnings. See *Warnings and Safety information* on page 4.

Checking the components

The enclosure components include:

- 1 – Left-hand enclosure cover
- 1 – Right-hand enclosure cover
- 1 – Bifurcated interlock cable
- 1 – Enclosure base plate
- 6 – Enclosure screws
- 1 – Tie bar

Tools required

To carry out the installation of the enclosure, you will also require:

- A short (stubby) flat-blade screwdriver (1cm)
- A long, flexible, hexagonal wrench (3.5mm across flats) or a 3mm Allen key

Preparing the microscope

Before you begin to install the enclosure, you should carry out the following steps.

1. Set the height of the stage, if necessary, so that it is positioned at a height appropriate for your usage.

   To do this, loosen the grub screw below and to the right of the stage; make any manual adjustment required, and then re-tighten the grub screw.

NOTE: If your microscope is fitted with a motorized stage, you may also need to adjust the settings for the stage height. See the documentation provided with the microscope for details.

2. Remove the rotating nosepiece from the microscope.

For further information on both of these steps, refer to the documentation supplied with the microscope.

Warnings and Safety information

WARNING

Ensure that the microscope and any laser source is switched off and unplugged from the mains supply before you start to fit the enclosure.

For further safety information refer to the documentation supplied with the microscope and the Raman system.

CAUTION

The assembly of the enclosure around the microscope should be carried out at the permanent location where the microscope is to be used, as once the enclosure has been fitted it should not be removed.

Fitting the Enclosure

WARNING

*In order to ensure correct operation and protection to Class 1 levels of laser radiation, we **STRONGLY** recommend that the initial installation of the Raman Microscope Enclosure is carried out by an authorised and qualified PerkinElmer Service Engineer.*

1. Place the base plate in a suitable location, oriented as shown in Figure 2.

   See the documentation provided with the microscope for information about correct positioning and handling.

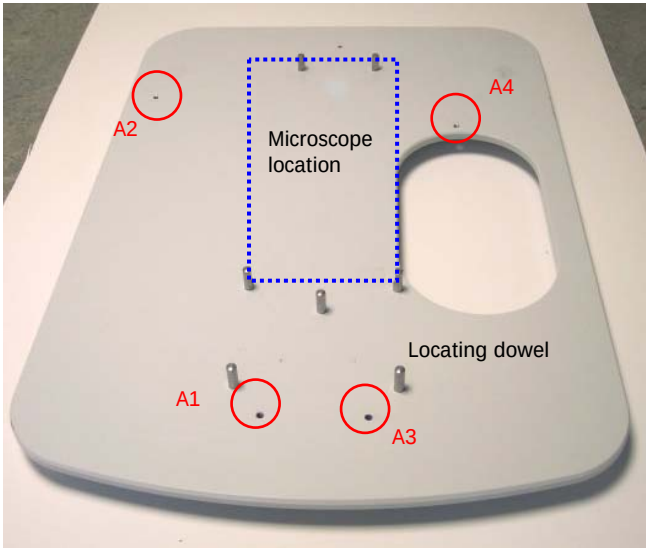

Figure 2 Microscope enclosure base plate

2. Lower the microscope onto the center of the enclosure base plate, between the two sets of locating dowels.

   The approximate position is indicated by the blue dotted rectangle in Figure 2.

   The microscope should be sat on its own feet on top of the base plate.

Figure 3 Microscope in position on base plate

3. Place the two halves of the enclosure cover on the bench, on either side of the microscope.

NOTE: At this point, you should fit the stage if you have not already done so. If your microscope is fitted with a motorized stage, you should refer to the section *Using the Enclosure with a Motorized Stage* on page 12 before continuing with procedure below.

4. Carefully lift up the microscope and feed the cables from the interlock sensors on the insides of the enclosure doors so that they pass out at the rear. See Figure 4 and Figure 5.

   The path of the cables should take them underneath the front of the microscope, between the locating dowels that position it on the base plate; beneath the microscope itself and then out at the rear in the gap between the microscope and the base plate, again between the locating dowels.

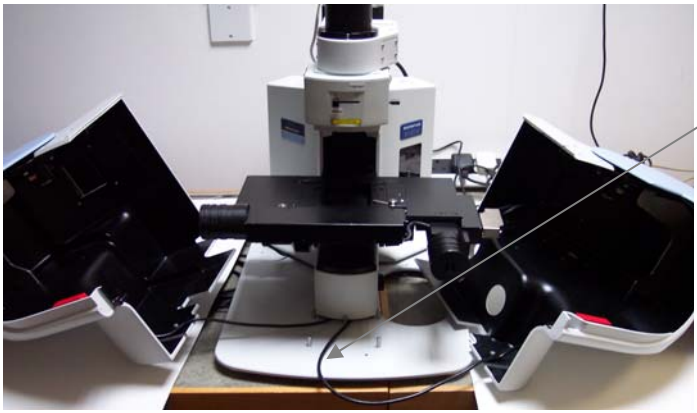

Figure 4 Interlock cables fed between the microscope and base plate

Figure 5 Cables emerging at the rear of the microscope

5. Lower the microscope back on to the base plate, holding the cables in place if necessary.

   Ensure that all cables are neatly fed through and that no load is pressing on them.

6. Slide the left-hand enclosure cover onto the base plate and beneath the microscope, so that the locating dowels on the base plate fit into the slots cut into the bottom of the cover.

   When the enclosure cover is in place, two screws at the front and back of the cover should be aligned with the screw holes A1 and A2 in the base plate, see Figure 2, and the cover should fit snugly around the microscope.

7. Tighten the two screws with a wrench or Allen key.

Figure 6 Securing rear screw

8. Repeat steps 6 and 7 for the right-hand enclosure cover, securing the screws A3 and A4 into the base plate.

9. Gently pull any excess cable through the assembly so that there is no loose cable inside the enclosure, but without placing any undue tension on the cables.

10. Introduce the tie bar into the enclosure, with the flat surface facing upwards and the grooved surface facing down, as shown in Figure 7.

Figure 7 Introducing the tie bar into the enclosure

11. The securing slots on the left and right of the tie bar fit onto protrusions on the inside of the enclosure molding, as shown in Figure 8.

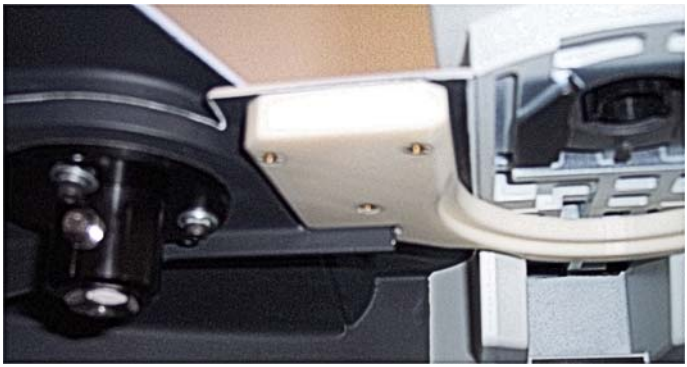

Figure 8 Tie bar slotted into place inside the enclosure

12. Fix the tie bar to the top of the enclosure using the six screws provided, as shown in Figure 9.

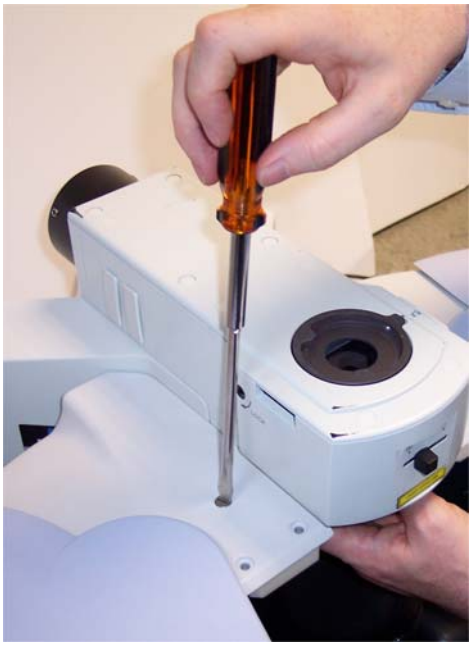

Figure 9 Fixing the tie bar

13. Close the enclosure doors.

    Notice that immediately behind where the doors meet, the left-hand side of the enclosure overlaps the right-hand side.

    Secure the two halves of the enclosure together by tightening the screw, as shown in Figure 10.

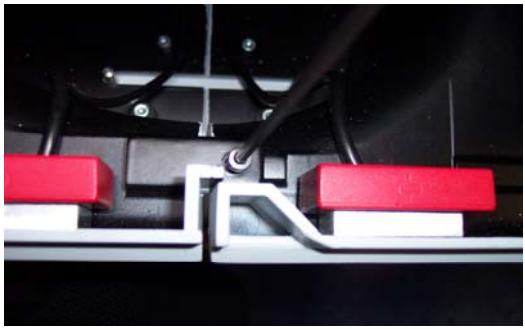

Figure 10 Securing the enclosure overlap

14. Fit the rotating nosepiece assembly back onto the microscope.
15. Check that the entire structure is strong and rigid, and that the doors swing freely and close properly.
16. Connect the interlock sensor cables from the two doors of the enclosure to the bifurcated interlock cable.
17. Connect the bifurcated interlock cable to the connector labeled **INTERLOCK** or **EXT INTERLOCK** on the rear of the spectrometer module.

    The cables are shown in Figure 11.

Figure 11 Interlock sensor cables and bifurcated interlock connector

The enclosure installation is now complete. You should now check that the interlock sensors are working correctly by opening and closing both doors.

To be certain of the correct operation of the interlock sensors, you should check that you can acquire data using Spectral Preview when the doors are closed. If the interlocks are not operating, a warning message will appear in the software. If such a message is displayed, contact your PerkinElmer service representative.

Using the Enclosure with a Motorized Stage

Your microscope may be fitted with a motorized stage which allows movement through X, Y and Z-axes to be controlled using a joystick or software.

Z-axis control cable

The cable from the Z-axis controller should be fed underneath the microscope and exit from the enclosure at the rear in the same way as the interlock sensor cables. This is described in Step 4 of the main procedure, on page 6. Ensure that you leave sufficient cable to allow for the full turning motion of the motor.

Once you have done this, continue the main procedure.

NOTE: If your microscope is not fitted with a motorized stage, the height (Z-axis) can be adjusted manually during the operation of the microscope by using the control knob which protrudes through the right-hand side of the enclosure.

X and Y axis control cables

The X and Y axis control cables need to be passed out of the enclosure to the stage control box before you attach the two halves of the enclosure cover to the base plate. That is, before you carry out Step 6 of the main procedure described on page 8.

1. Attach the bifurcated X/Y stage control cable to the serial port on the right-hand side of the stage.

2. Locate the access panel on the base of the right-hand enclosure cover; see Figure 12.

Figure 12 Right-hand enclosure cover showing access panel

3. Remove the access panel, to reveal a cut out in the base of the enclosure.
4. Run the two stage control cables through the cut out and attach them to the access panel, leaving just sufficient cable free so that when the access cover is replaced and the right-hand enclosure cover is attached to the base plate the stage has full travel through its X and Y axes.

Secure the access panel to the base of the right-hand enclosure panel.
You should now continue the main procedure, at Step 6; see page 8.

Fitting a motorized stage after the enclosure has been fitted

If you fit a motorized stage to your microscope after you have fitted the enclosure, all the control cables can be passed out of the enclosure through one of the rear access ports. See *Using the Enclosure with Third-Party Accessories* on page 15 for details.

Maintenance

The enclosure does not require regular maintenance other than occasional checking and cleaning.

You should, however, check regularly that:

- The interlocks on the front of the enclosure are fully operational, and that the doors close fully and easily.
- Any access ports in use on the rear of the enclosure are secure and light-proof.

You can clean the outside of the enclosure using a soft, lint-free cloth, moistened if required with a little water. Mild detergent may be used, if necessary. Do not use abrasive or solvent-based cleaning materials. Always perform a patch test on an inconspicuous area before you clean the entire enclosure.

Avoid spilling liquid into the enclosure. Clean all external spills immediately. If anything that is spilled enters the main body of the enclosure, make the microscope inoperative and then contact a PerkinElmer Service Engineer.

Using the Enclosure with Third-Party Accessories

If you have third-party accessories fitted to your microscope, access to them (for cables, pipes, and so on) is provided by light-proof ports on the rear of the enclosure.

Figure 13 Rear of enclosure showing access port

These ports should not be removed.