



Ventacon UK

MANUFACTURERS OF SPECIALIST  
SCIENTIFIC EQUIPMENT

for RAMAN AND INFRARED SPECTROSCOPIES

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## **CATALYSIS CELL OPTIMISED FOR BRUKER INSTRUMENTS - OPERATING INSTRUCTIONS**

### **General Description**

The cell consists of a horizontal borosilicate glass tube 8mm in diameter, heated by an oven. The tube can be evacuated or have gases/vapours passed through it.

### **Unpacking**

Remove the loose foam and discard.

The silver case contains the D Series Universal Power Supply, a supply lead and a cable to connect it to your PC. See separate operating instructions for the Power Supply.

The other case contains the cell unit and a set of supplies and spares in the centre. Two hexagonal drive screwdrivers are also enclosed.

Remove the cell carefully from the box.

The glass sample tube, its end fittings and the oven are all mounted on an assembly that pivots about a horizontal stainless steel rod or runs on a vertical ball slide.

The vertical position of the tube is controlled by a miniature motor/gearbox and an eccentric.

### **Mounting the Cell in the Bruker Spectrometer**

1. Remove the standard Bruker sample holder. This will reveal 4 off M3 threaded screw holes in the translation stage.
2. Adjust the translation stage to the centre of its travel.
3. Lift the tube/oven unit of the cell to reveal two lines of countersunk holes.
4. Place the cell base on the Bruker translation stage and select 4 suitable holes.
5. Use the 4 M3 screws provided to fit the cell base.  
DO NOT OVERTIGHTEN THE SCREWS.
6. Check you have used the correct holes and that the oven will ALMOST touch the prism holder.
7. Plug the motor unit into the Universal Power Supply.
8. Switch on and start the motor. The tube and oven will rise and fall.
9. Check that the amplitude is suitable for your application.
10. Remove the Cell.

### **Mounting the Cell in Thermo Nicolet and Other Spectrometers**

No screws are required in these cases. The Cell system will incorporate a mount to fit into your instrument's sample support.



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### Fitting Capillary Tubes, Adjusting and Loading the Cell

1. Find the two lengths of steel capillary tubing.
2. Cut each to length and make a tube to tube connection at the open end of each tube. The other ends carry a fitting.
3. Insert the fitting ends of the tubes into the in-flow and out-flow fittings as far as they will go and screw them home GENTLY.  
DO NOT REMOVE THE TUBES FROM THE IN-FLOW AND OUT-FLOW FITTINGS AS A ROUTINE PROCEDURE.
4. Disconnect at the tube to tube connection.
5. With the cell on the bench and the operating face towards you, you will see a removable plug on the right-hand end of the system (the in-flow end). Remove the plug.
6. Load the tube with a pad of glass or silica wool. Enter the sample. Seal with a second glass pad.
7. Ensure the sample lies in the centre of the oven.
8. Replace the end plug.

### Operation of the Cell

Some cells can be heated to 300 °C and above. HOWEVER THIS CAN ONLY BE DONE OUTSIDE THE SPECTROMETER. Thus you can activate a catalyst on the bench but NOT in situ.

1. Fit the cell into your spectrometer.
2. Check for clearance and freedom of movement.
3. Connect up the stainless steel capillaries. In-flow system INPUT is at the front, exhaust at the rear.
4. Adjust the spectrometer focus.
5. Connect the heater to the Universal Power Supply.
6. Connect the thermocouple to the Universal Power Supply. Use the K type socket\*.

Note\* Some later cells use Rtd sensing and control through the HOT socket in the Universal Power Supply.

#### TIPS

Vertical movement reduces sample burning. It does not prevent it.  
If your catalyst is coloured and absorbs the laser emission REDUCE POWER. This reduces sample heating. It is beneficial to increase movement and amplitude.

### Changing the Sample

1. Remove both end plugs and hook the sample and glass pad out of the tube with a piece of wire.
2. Blow any loose fibre and powder out of the tube with compressed air through the EXIT capillary.
3. Refill the tube in the normal way.



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### Changing the Borosilicate/Silica Glass Reaction Tube

Spare 'O' rings and tubes are supplied.

We suggest you put the Cell on a tray so that you do not lose any screws or washers. When you remove a screw – remember that it must be replaced in its hole – screws of different lengths and threads have been used.

Examine the top of the Cell. You will see 4 button headed Stainless Steel screws and 2 tall hexagonal nuts.

1. Remove the 4 button headed screws and slacken the 2 nuts by about 2 turns.
2. Remove the exhaust side fitting from the reaction tube by slackening the two small hexagon cap screws.
3. Remove the plug through which samples are loaded and removed.
4. Carefully remove the reaction tube from the oven. [This is tricky in the 300 and 450 cells but there is room]. DO NOT FORCE THIS STAGE. WITH CARE THE TUBE WILL COME AWAY FROM THE OVEN. As you do so, note which components are fitted to the tube and how they fit.
5. An 'O' ring lies in the in-flow fitting and can be replaced if desired. Similarly, another will be found in the out-flow fitting.
6. Re-assembly id the reverse of the above. HOWEVER, we recommend that you tighten the screws and nuts referred to in (1) above in the following order: -
  - a) Having fitted the tube, fit the screws in the out-flow bracket and leave them loose.
  - b) Fit the in-flow unit onto the tube. Fit the screws and leave them loose.
  - c) Tighten the four screws until they JUST feel tight.
  - d) Tighten down the nuts gently.
  - e) Tighten the 4 screws gently.
  - f) Refit the out-flow fitting.