

# Miran 1A Infra-red Spectrometer

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The Miran 1A Infra-red Spectrometer covers wavelengths from 2.5 to 14.5 microns. The cell path length can be varied from 0.75m to 20.5m. This is achieved with gold plated mirrors producing multiple reflections. The Miran 1A is essentially portable provided a source of mains power is available. The output can be recorded with a suitable data logger. The Miran 1A has its own air pump for filling the cell with the sample gas.

## Controls

### Set Wavelength



The control for setting wavelength is shown. The control is continuous from 2.5 to 14.5 microns. This range is split into 3 bands seen as you turn the knob. This is because 3 diffraction gratings are used to give good performance over the whole range. The bands cover from 2.5 to 4.5, 4.4-8.0 and 7.9 to 14.5 microns respectively. To convert to  $\text{cm}^{-1}$  simply invert the wavelength in microns and multiply by 10000.

## Slit (mm)

Below the Set Wavelength knob is the slit adjustment. This determines the resolution but it may produce a noisy signal if it is set too fine. There are 4 settings: 0, 0.5 1 and 2 mm. The instrument is commonly set to 2mm.

## Scan



This switch provide a motorised scan of the spectrum and it can be used to produce a spectrum. For best results the sensitivity should be adjusted using a blank spectrum.

## Power

This turns the instrument on or off

## Zero Control



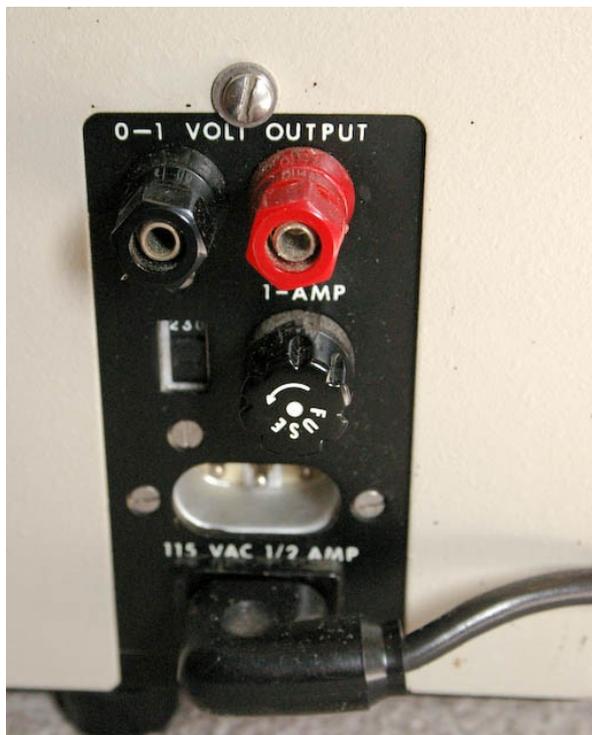
This control adjusts the sensitivity so that the reading is 100% transmission for zero sample. A **x1 or x10 switch** provides a coarse adjustment if necessary.

A **Range** switch gives a choice between **transmission** readings or 4 ranges of **absorbance** readings. Use the **zero control** to zero the display.

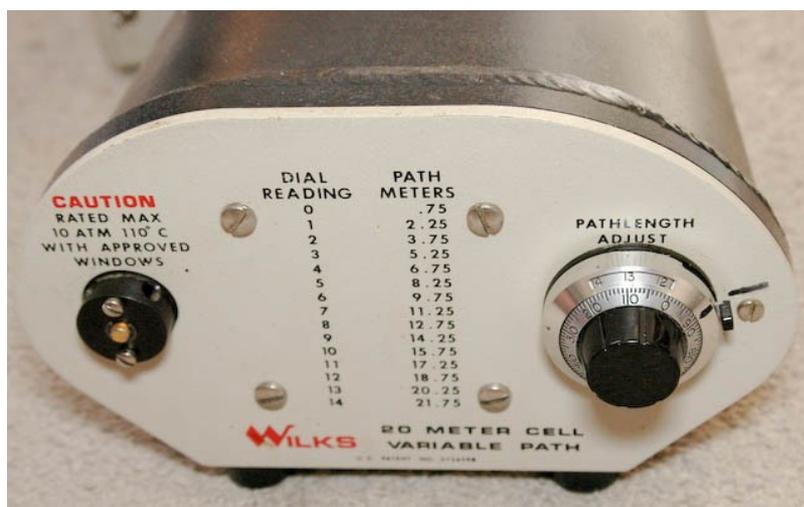
For noisy signals the meter time constant can be adjusted from 1 to 40 seconds using the **Meter Response** switch.

A 230 volt power cord is provided which is plugged into the back of the instrument. A 1 amp fuse provides protection. The 115V input is where the power cord is plugged in. The input voltage has been changed from 115V to 230 volts AC. Be tidy with the recorder output wiring as mains circuits are nearby.

On the same panel are two **recorder output** terminals. The output range is 0-1 volts which makes it suitable for many data logging systems.



## Pathlength Adjust



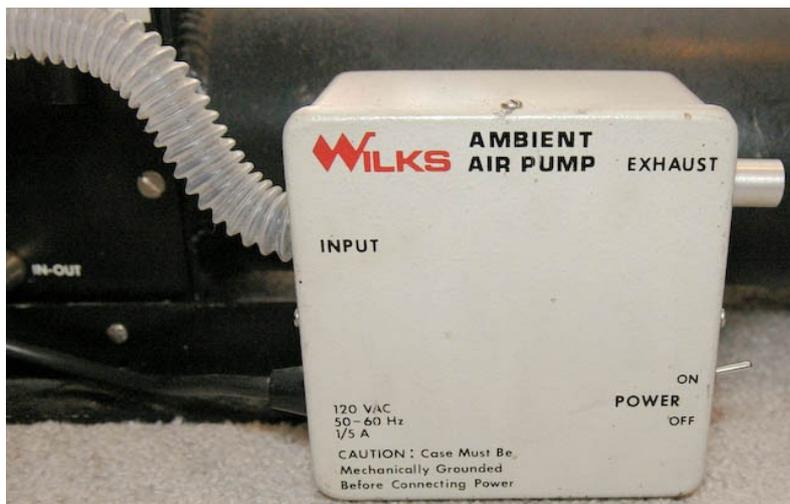
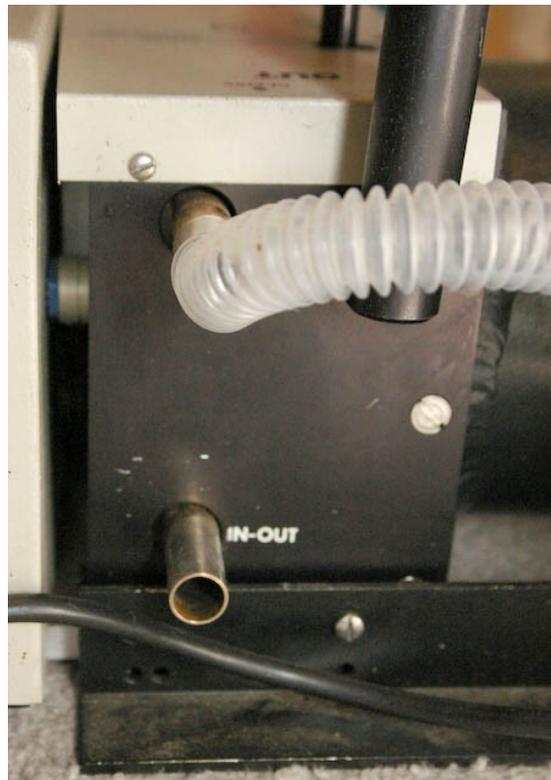
Use the control to adjust the cell path length according to the table. Longer path lengths give increased sensitivity. There is a lock on the control so release it before turning the control.

The gas pressure can be above 1 atmosphere but this is not recommended for normal use.

There are two valves in the gas circuit, one for the inlet and one for the outlet. This allows for the possibility that the cell could be evacuated and backfilled as well as being used as a normal flow through system. Normally both valves would be open. A drier should be used in-line to reduce the water content and to prevent condensation. A dust filter would also help to keep the cell clean.

The inlet valve handle is also used to carry the instrument.

An air pump is used to suck samples through the instrument. The power switch is on the side.



Turn the valves off when the instrument is not being used.