Spark Chamber – Notes

Operation of the chamber

In case of problems please contact one of the following:

- Steve
- Maurice
- Bart

Switching ON

1. Switch on mains at wall socket.
2. Switch on mains at control box at the bottom of the chamber, and check for flickering green and amber lights on the control box
3. Check that gas is flowing. 10ml/min is OK for normal operation. Can be increased up to 80ml/min or more if there has been no gas flow for some time.
4. Switch on HV supply at the control box, and ramp to operating voltage using the dial at the side panel, while checking for correct sparking behaviour. Reddish sparks at random at about 0.5Hz from 4kV upwards. If in doubt ramp down and switch OFF the HV and call one of the experts. The maximum setting (10=10kV) of the dial is fine in normal operation.

Switching OFF

1. Ramp down HV and switch off at the control box.
2. Switch off mains at control box
3. Switch off mains at wall socket

Note: Once you are happy that the chamber is working correctly it is OK to enable/disable the HV using the toggle switch while leaving the dial set to the normal operating voltage.

Safety considerations

1. In case of an electrical emergency disconnect from wall socket if you can do so without risking yourself.
2. The gas bottle is pressurised. Do not drop or allow to fall over. Must always be stored and secured in an upright position when not being moved. Can be moved short distances by hand. Use a trolley for longer distances and secure the bottle to the trolley. The gas mixture is He/Ne, non-toxic, non-flammable. The bottle presents an explosion risk in the event of a fire.
3. If you suspect a problem with the gas supply close the main bottle valve.
4. Call one of the experts.

Installation

We will take care of installing and setting up the chamber. These installation notes are provided for reference.

The chamber and gas bottle are heavy and must be placed on stable supports. Use either the frame provided or place the chamber on a strong table with the gas bottle on the floor and secured in an upright position. When using the frame, the gas bottle can be located in the space under the chamber and secured in position. This allows the chamber to be repositioned easily as the frame has wheels. When moving on uneven surfaces, however, it is intended that the chamber should be placed directly on the lower, wheeled platform for better stability.

The gas bottle is fitted with a pressure regulator. The bottle valve can be opened and closed as needed and the regulator valve should stay at a setting of 1.5bar. The regulator valve turns clockwise to open (i.e. to increase the pressure).

The gas pipe work is push-fit at the gas bottle regulator outlet and has a self-sealing coupler at the chamber inlet. Gas flow is regulated by the bubbler valve. The other valve near the bubbler is the bubbler bypass valve. This is used exceptionally to allow the chamber to be flushed at a high rate.

When connecting or disconnecting the pipe work, the gas bottle main valve and bubbler valve should be closed.

The chamber is connected to the mains wall socket with a standard cable and the HV box is daisy-chained to the lower box. There is also one flat ribbon cable that carries signals between the upper and lower scintillator box and a second, shorter one between the lower scintillator box and side panel. All of these must be properly connected before switching on.