



Installing the Humidity Generator and Controller onto a Chamber

The optimum sample chamber volume is 200ml which combines with the gas flow of approx 600ml/min to give a quick response to humidity changes. However if there is another gas flow into the chamber or if the chamber is larger than 200ml, the response time will be reduced and unstable control of the humidity may result. Tuning of the PID control can improve control for specific application conditions, however, if the chamber is relatively large, then the maximum humidity/temperature configurations will be reduced.

The main issue is porting in the Humidity into the target chamber that requires humidity control. The humidity sensor and heated transfer line input need to be securely fitted to the outside of this chamber, in such a way that the transfer line has easy access, and that the sensor is positioned near to the sample but away from the heated line output.

Figure 1, below details the mounting holes that will suite the standard fixtures.

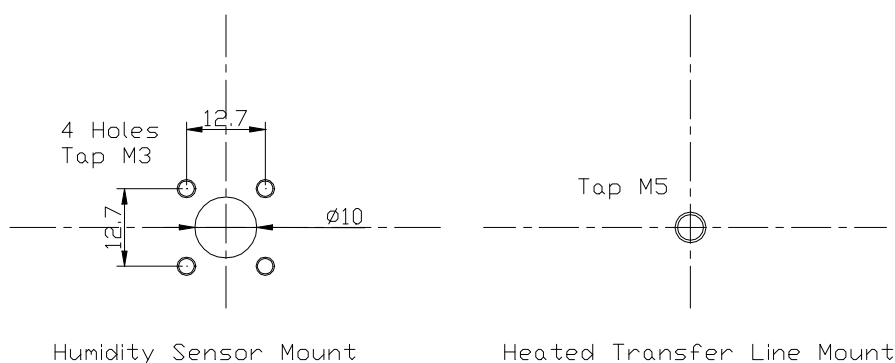


Figure 1

The humidity sensor can be fitted to a panel with an 11mm diameter hole, using the thread and nut on the front of the socket. Also the 4mm push fitting could have a 1/8" or 1/4" thread on its base which could be used to attach it to the sample chamber.

Be careful not to choose a fitting with large thermal mass, as it may not reach a high enough temperature to prevent dew formation.

The next considerations that need to be addressed are whether the chamber is sealed, and whether there is any other pressurised gas source flowing into the sample chamber.

The Humidity Controller cannot function correctly in a totally sealed chamber since it requires an exit flow of gas. If an exit port has to be engineered then it must be suitably sited such that if the gas on exit drops in temperature below the dew point in the chamber, the condensing liquid must be able to flow out of the chamber, without affecting the humidity inside.

If there is another source of pressurised gas flowing into the chamber, it will effectively dilute the effect of the humid air from the Controller. A common problem is created by air bearing spindles where the exhaust gas is bleeding into the sample chamber. Provided that the instrument is not being used at the limits of its specification, the controller should be able to add sufficient extra humidity to achieve the desired level of %RH.

Figure 2 below illustrates a simple application where the Humidity Generator and Controller is controlling the Humidity inside an empty coffee jar. Note that there is an exit port on the lid as well as the connections for Humidity and the Sensor.

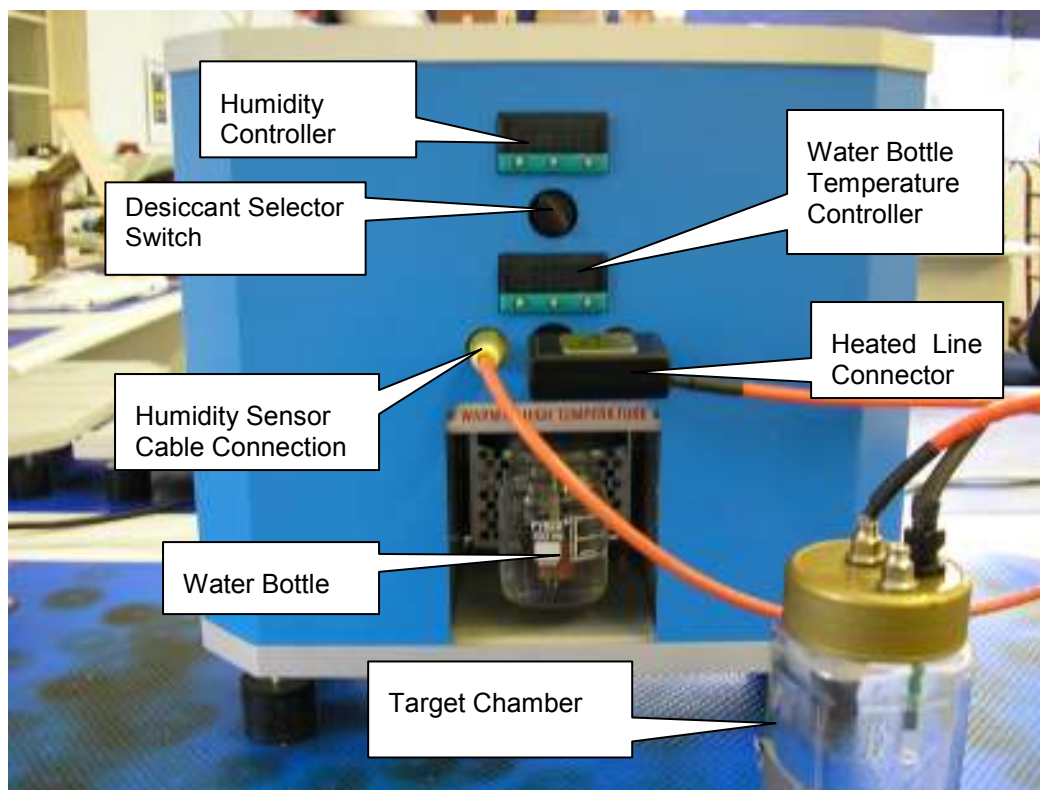


Figure 2

Figure 3 below shows the back of the unit and the various connections and features.

The operation and set up of the unit itself is provided in detailed form in the Instruction Manual provided with the unit on delivery.

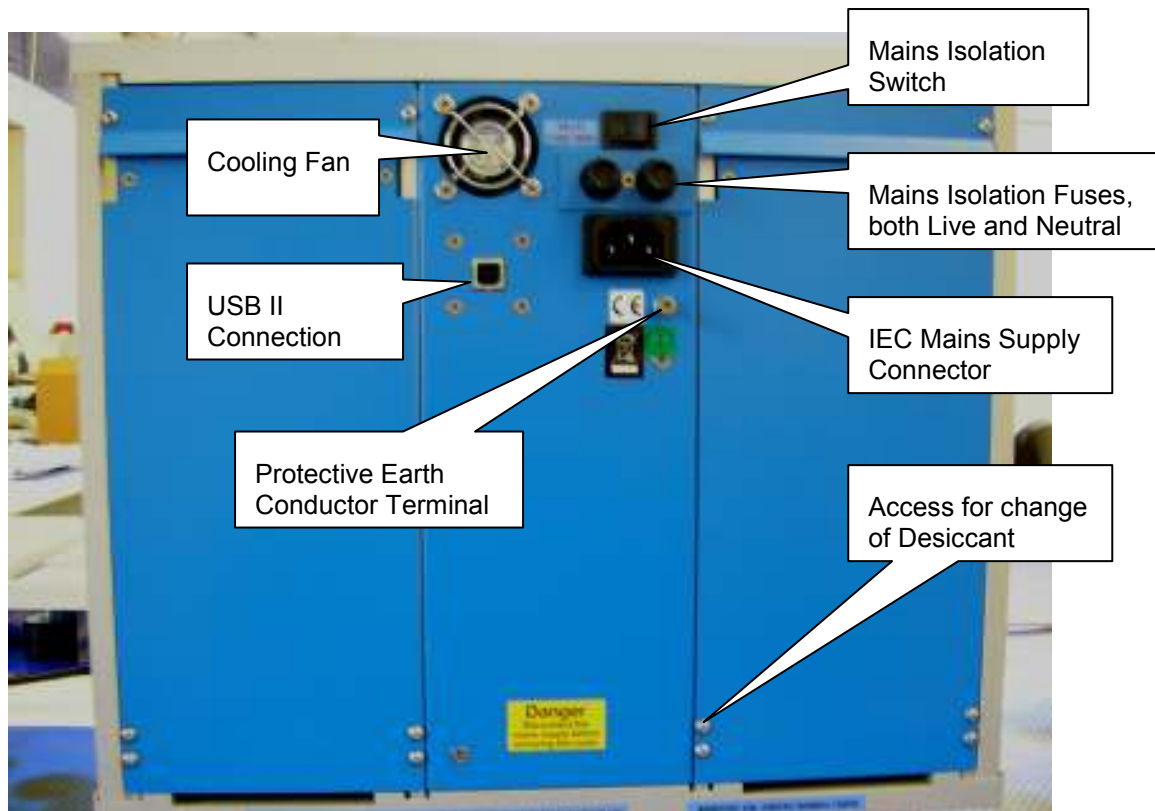


Figure 3

Figures 4 and 5 below show the Humidity Sensor Assembly. The black flange is used to attach the Sensor to the target chamber. It should be arranged such that it can easily be removed if required to allow replacement if the sensor is poisoned or fails for any reason. The normal specification of this sensor allows for operation up to 85°C. Higher temperature operation will severely reduce operational life.

Calibration of sensors/system can easily be accomplished by using a set of saturated salt solutions. The sensors are normally pre-calibrated but users can easily perform this operation if required.



Figure 4 - Sensor with PTFE shield tube



Figure 5 - Sensor without the PTFE shield tube

A final consideration should be given to the distance of the target cell from the Humidity Controller and Generation unit. The heated humidity transfer line ideally needs to be as short as possible. The standard configuration provides a line that is 0.5 metre long. The Sensor connection cable is the same length.

If a longer connection is required, please contact Triton Technology. This is not immediately straight forward and would require modifications, not only to simply extending the heated humidity transfer line and Sensor connection cable, but to the power supply to the heated humidity transfer line as well in order to maintain the correct temperature along its length.