

Protocols for use of Douglas Bags, Servomex and Dry Gas Meter

Douglas bag preparation

- Evacuate Douglas bag using the Dry Gas Meter.
- Attach the bag to the Dry Gas Meter, open the valve on the bag, turn on the vacuum and run until the number on the vacuum remains stable.
- Close the valve on the bag, turn off the Dry Gas Meter.

Douglas bag data collection

- It is imperative that data collection is precisely timed using the stopwatch.
- Ensure that the participant is in a well ventilated area and away from others as much as possible to prevent contamination of inspired gases.
- Respiratory gases are collected for an exact period of time (normally 60 seconds).
- It is important that the mouthpiece and nose clip are worn by the participant PRIOR to the start of the data collection period (e.g. ask the participant to attach the nose clip and mouth piece in the 30 seconds before the planned time for data collection).
- The data collection period should have a clear count down from the timekeeper e.g. 3, 2, 1, GO, in which the valve of the designated Douglas bag is opened/closed in line with the count down. At the same time, the stopwatch is started.
- Record the Heart Rate during the final 15s of the expired air collection.
- Once this data collection has been completed, remove the mouthpiece and nose clip from the participant.
 - It may be advisable to provide the participant with some blue roll to remove the mouthpiece.

Douglas bag data analysis

- Firstly, the gas concentration (%O₂, %CO₂) of each bag must be sampled.
 - Analysing the gas concentration is completed for an exact period of time (1 min) and is precisely timed using the stopwatch.
 - A 1 minute sampling period equals the removal of 1.8 L of air.
 - Hold the sample line of the Douglas bag firmly closed and THEN remove the clip/stopper from the end.
 - Still holding this sample line closed, attach the sample line of the Douglas bag to the sample line of the Servomex gas analyser.
 - The sampling period should have a clear count down from the timekeeper e.g. 3, 2, 1, GO, in which the sample line is opened/closed in line with the count down.
 - Press the bottom left button on the Servomex to commence/stop collection.
 - Record the numbers on the Servomex within the last 15 seconds of the sampling period. If these are not recorded at this point, they will disappear when the sample line of the Servomex is put back into ambient air.
 - At the end of the sampling period, hold the sample line of the Douglas bag firmly closed until the clip/stopper has been replaced.
- Secondly, the volume of gas within the bag must be measured.
 - Attach the Douglas bag to the Dry Gas Meter as previously described.
 - Make sure the Dry Gas Meter monitor is reset to 0 before starting.

- Opening the valve and turning on the Dry Gas Meter must be coincided for accurate measurement of volume. Again, an individual should countdown, e.g. 3, 2, 1, GO, when the Dry Gas Meter should be turned on, and the valve of 1 bag opened.
- When the number is stable, note the value.
- Add 1.8 L to the value. This is to accommodate for the 1.8 L removed during the gas concentration sampling.

Cleaning

All mouthpieces, nose clips and breathing tubes must be sterilised with Milton between participants.

Results

Sample	Ambient Temp (Deg C)	Ambient Pressure (mmHg)	Subject Weight (kg)	Subject Height (m)	Bag Volume (L)	Time Sampled (s)	FEO2 (%)	FECO2 (%)	HR
<i>e.g. rest, 100W, etc</i>									

Use the Gas Calc Excel document on the PC in order to convert the raw data into relevant variables.

Ensure the ambient conditions and participant characteristics have been input into the datasheet.