Climate measurements
Equipment and methods
Climate parameters

• Temperature
• Relative humidity
• Air movement / air infiltration
• Air quality / air pollution
• Light and radiation
Temperature

- Thermal expansion (ethanol, mercury)
- Electric resistance (pt 100)
- Electric voltage (thermo element, CuCo etc.)
- Infrared radiation (surface temperature)
Relative humidity

- Hygric expansion (wood, hair)
- Electric resistance/capacity (polymer)
- Psykrometric temperature (wet bulb)
- Dew point temperature (condensation)
Mechanical hygrometer
+/- 10 %RH
Electronic hygrometer
 +/- 5 %RH
Psykrometer

+/- 2 %RH
Psychrometric Chart

Barometric Pressure 101.325 kPa
Dew point mirror
+/- 1 % RH
Psychrometric Chart
Barometric Pressure 101.325 kPa

- Wet bulb
- Dew point

Enthalpy at Saturation (J/g Dry Air)

Wet Bulb Temperature (°C)

100% RH
50% Relative Humidity
0% Relative Humidity

Humidity Ratio (gm Water / gm of dry air)

Temperature (°C)
Calibration
Salt solutions

MgCl$_2$ (33 %RH)  
NaCl (75 %RH)
Climate chamber
How often?

- Daily readings. Hand held devices. Will only give annual variation
Where to measure?
Air movement/air infiltration

- Anemometer (air speed)
- Cold smoke (air leaks)
- Soap bubbles (drafts, convection)

- Pressurization test (blower door)
- Decay rate of inert gas concentration (CO2)
- Constant dose of inert gas (pft – method)
Measuring air exchange rate by PFT-method
The PFT-method PolyFlourcarbon Tracergas

Tracergas source

Absorption tube
Measure AER by inert gas emitted at constant rate
Doors and windows are single glazed and quite leaky.
Ground floor 547 m³  ‘Yellow’ tracergas
First floor 301 m³  ‘Red’ tracergas