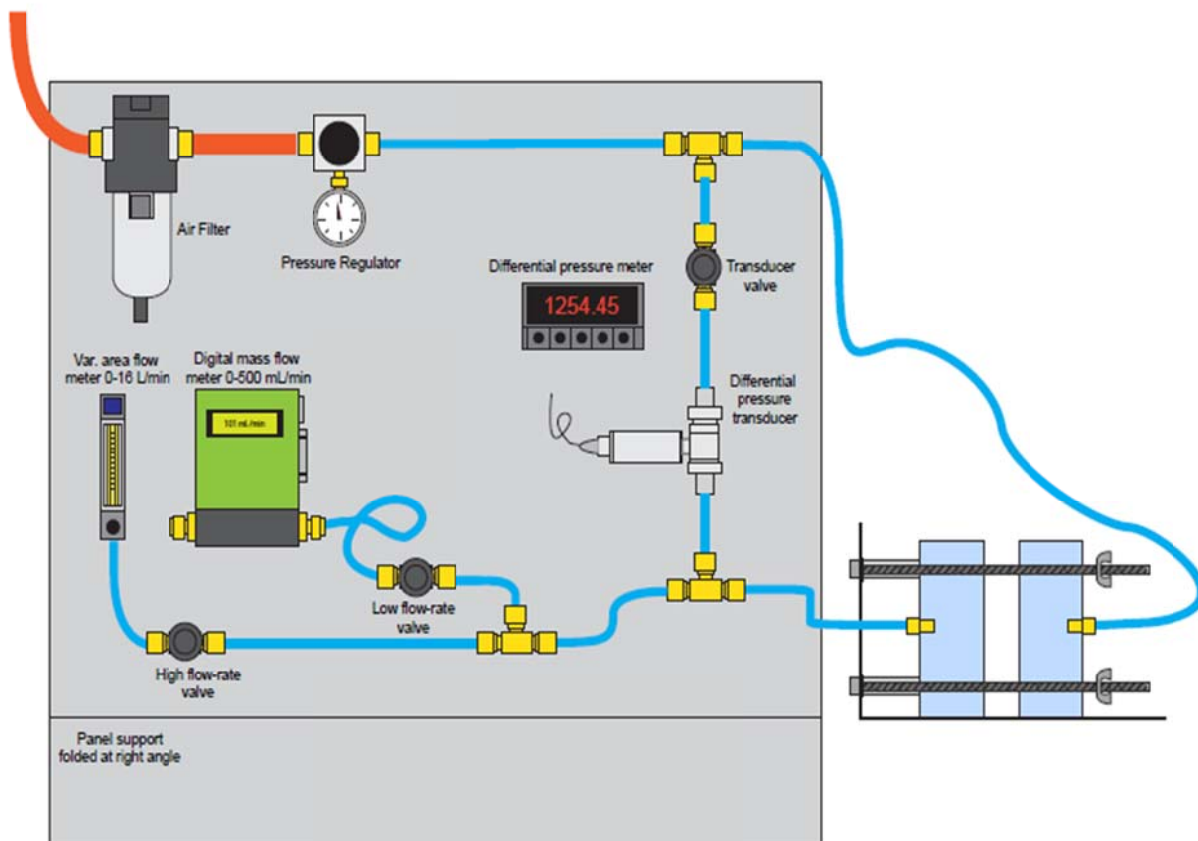
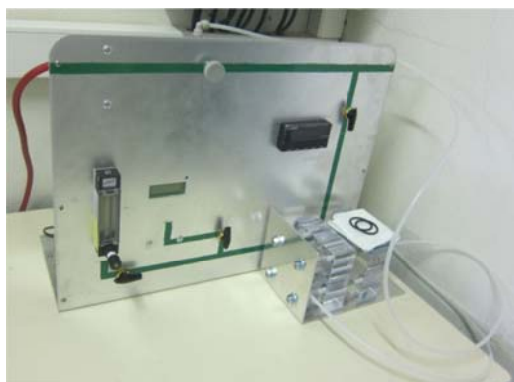


Permeameter measurements

Meaning The efficiency of volatile escape from volcanic conduits during eruptions is inferred to play an important role in eruption dynamics, particularly in controlling shifts between explosive and extrusive eruption styles. Permeability measurements and detailed quantification of the pore structures of samples from different styles of eruptions would aid in understanding observed large (orders of magnitude) disparities in permeability between samples of the same porosity. Furthermore, textural data such as bubble geometries and pore aperture sizes are useful input parameters for numerical percolation simulations. to understand permeability development and degassing of vesicular magmas.



Methodology Within the visiting position of Thomas Shea at Clermond Ferrand in May 2013 we built a permeameter designed by Takeuchi et al. (2008) to perform very reproducible permeability measurement of quenched volcanic porous materials. The permeameter has broad measurement ranges of pressure difference (10^1 – 10^5 Pa) and gas-flow rate (10^{-9} – 10^{-5} m³/s). These ranges enable us to measure viscous permeability in the range of 10^{-17} – 10^{-9} m² for 1 centimeter-scale samples, using the Forchheimer equation (Rust and Cashman 2004), which includes the inertial effect of gas flow permeating through samples. The most time consuming side is the preparation of the samples, as shown in the cartoon



Permeametr at LMV

