

96 GDS Helpsheet



*World Leaders in Computer Controlled Testing
Systems for Geotechnical Engineers and Geologists*

Hardware

STD & ADV Controller

Volume Change Under Constant Pressure

1. Introduction

You can test for leaks in a controller by closing the pressure outlet and setting a constant pressure of say 2000 kPa. The controller is not leaking if over a period of three days the volume change just goes up and down through the day - this is due to changes in air temperature. The controller is leaking if the volume change just gets progressively more negative day after day at the same time in the day.

You can perform the test over a period of three or four days for the controller. If the controller is a 1000cc controller the variations in volume change that you should expect will be much larger (probably five times larger). Everything changes shape and volume with temperature and the bigger it is the more it changes - this is why for high quality laboratory testing you should have good temperature control. You only notice it with the GDS controllers because they have such good volume resolution. For example 1000cu. mm represents only 0.1% of the volume change of a 1000cc controller.

Results that show large variations in volume change on a daily basis could indicate a combination of two things:

1. The controller has not been properly de-aired or the water was not de-aired.
2. The laboratory is not temperature controlled.

What happens is that temperature changes cause volume changes in the water (and any trapped air) in the controller. Because the controller is maintaining a constant pressure it will change the position of the piston to keep the pressure constant - this change in position is recorded as a volume change.