

Options available for STDDPC

Pressure ranges

- 1MPa Available on request
- 2MPa Available on request
- 3MPa *Standard Option
- 4MPa Available on request

Volume

- 200cc

Standard Pressure/Volume Controller (STDDPC) v2



Version 2, released 12/01/2010

What is it?

The GDS Standard Pressure/Volume Controller (STDDPC) is a general-purpose water pressure source and volume change gauge. It is designed for use in commercial and teaching soil mechanics laboratories. A stepping motor and screw-drive actuate a piston which directly pressurises water. The pressure is regulated under closed-loop control. The change in volume is measured to 1cu mm (0.001cc) by counting the steps to the stepping motor.

What are its uses?

The STDDPC, typically operating at 3MPa/200cc, provides a cost-effective direct replacement for conventional soil mechanics laboratory pressure sources and volume change gauges. Above all, the device has its own computer interface and so can be controlled directly from a computer. It is ideal as a back pressure source where it can also measure the change in volume of the test specimen. Also, it automatically protects itself from pressure and volume over-ranges.

In stand-alone mode, the instrument is a constant pressure source which can replace traditional laboratory pressure sources such as mercury column, compressed air, pumped oil and dead weight devices. It is also a volume change gauge resolving to 1 cu mm.

Recently upgraded to a version 2 unit, advantages over the version 1 standard controller include;

- USB connectivity,
- Faster Fill / Empty and pressure seek speeds,
- Lighter and with a smaller footprint.

How do you use it?

The instrument may be controlled via a PC or by using the optional Smart Keypad.

Via a PC

Compatible with the GDSLAB software suite, this windows

Technical specification

- **Pressure ranges:** 1, 2, 3, 4MPa
- **Volumetric capacity (nominal):** 200cc for all pressure ranges
- **Resolution of pressure measurement:** 1kPa on display, 0.1kPa via software (10 x improvement on version 1 STDDPC)
- **Resolution of volume measurement:** 1cu mm
- **Accuracy of measurement:** pressure = <0.15% full range, Volume = <0.25% measured value with +/- 30mm³ backlash
- **Closed-loop microprocessor control of pressure:** regulated to 0.1kPa (10 x improvement on version 1).
- **Closed-loop microprocessor control of volume:** regulated to 1cu mm
- **Size:** 620mm x 100mm x 140mm
- **Weight:** 10.2kg
- **Power:** 100-240V~1.6A MAX, 50-60Hz
- **Ambient temperature range:** 10°C to 30°C
- **Relative humidity:** 20% to 80% non condensing
- **User interface:** PC based software or Optional Smart Keypad featuring state-of-the-art Organic LED display technology with 180 degree viewing angle and 16 key input with audio feedback
- **Computer interface:** USB computer interface for computer control and logging of pressure and volume
- **Maximum operational speed:** Control Fill/empty speed = 500 mm³/s. Fast Fill/empty up to 1200 mm³/s.

based application will allow you to operate the device. In its simplest form, a display window shows the current pressure and volume. For example, to set a constant pressure type "500" into the Pressure textbox and press enter or click Seek Pressure. The controller will then seek to a target pressure of 500kPa. The current pressure and volume are displayed above.

Using a Smart Keypad

Simply plug the Smart Keypad into the STDDPC and the Smart Keypad will automatically recognise the controller and display the current pressure and volume. For example, to set a constant pressure merely type "500" using the membrane keypad – the Smart Keypad will display the text "500 kPa". Pressing the green enter key will cause the controller to seek to the target pressure of 500kPa. The current pressure will be displayed in the top right corner.

How does it work?

Liquid (normally deaerated water) in a cylinder is pressurised and displaced by a piston moving in the cylinder. The piston is actuated by a ball screw turned in a captive ball nut by an electric motor and gearbox that move rectilinearly on a ball slide (see Fig. 1).

Pressure is measured by an integral solid state transducer. Control algorithms are built into the onboard microprocessor to cause the controller to seek to a target pressure or step to a target volume change. Volume change is measured by counting the steps of the incremental motor.

Optional: Digital Remote Feedback Module (Digi RFM)

Normally, the feedback to the main control circuit board comes from the internal pressure transducer. However, this input could come from a different source, such as a remote

transducer. GDS has developed this into an elegantly-engineered enhancement which is the Remote Feedback Module (RFM).

The RFM (see Fig.2) enables the output of an external transducer to be measured and displayed by the controller. It also enables the piston action to be controlled from the feedback of the external transducer. Both the internal pressure transducer and the external transducer readings are displayed and transmitted over the computer interface. Benefits of the Digi RFM include:-

- Precision when regulating from the external transducer, as it can be positioned closer to the experiment.
- Can increase the accuracy of the application by choosing a transducer closer to the range of the experiment.
- Can be used with wet wet differential pressure transducer to increase the accuracy and measurement, e.g. for precise control between back pressure and cell pressure for accurate measurement and control of effective stress.

The schematic diagram in Fig 1 shows how the Digi RFM works in relation to the controller

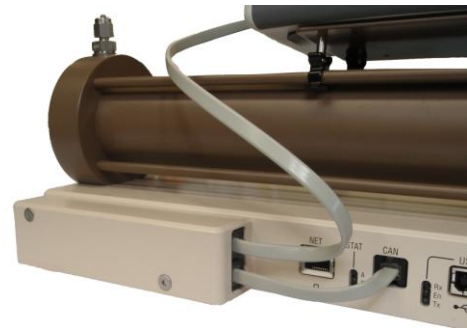


Fig. 2 Optional Digi RFM

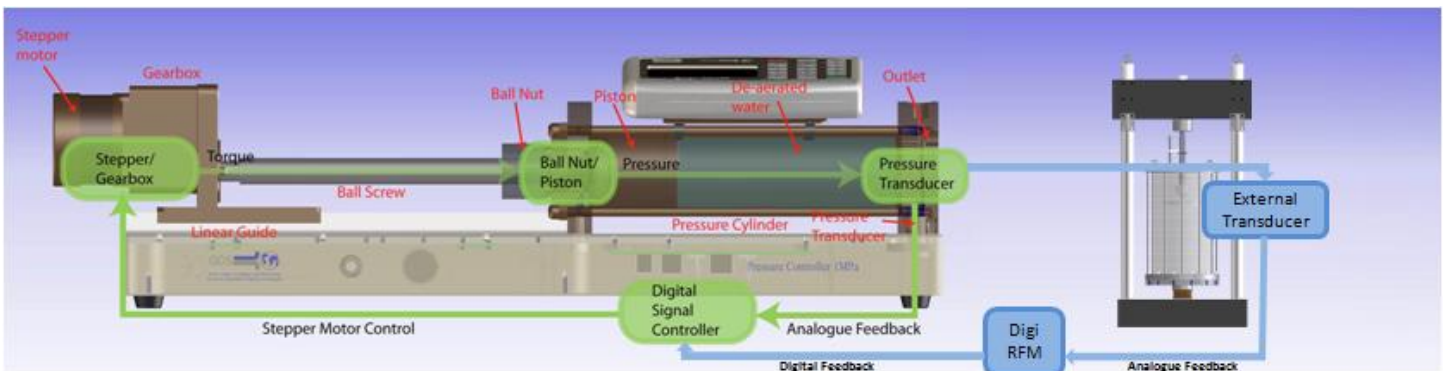


Fig. 1 Schematic of a GDS Standard Level Controller and the extra features of a Digi RFM

Why buy STDDPC?

- Volume resolution = 1cu mm (0.001cc)
- Pressure resolution = 0.1 kPa as displayed on the software, 1kPa on smart keypad
- Can be used stand alone, or computer controlled
- Compressed air not required
- Compatible with GDSLAB control and acquisition software
- USB Interface

Due to continued development, specifications may change without notice.