Sr#	Description	Qty.
1	**High Precision Piezometer (D33 Meter) or equivalent** D33 range: 1-100 pC/N Accuracy: ±2% ±0.1 pC/N Capacitance Range: 10pF-0.1µF Test Frequency: 1 kHz Tan Range: 0.0000-0.2000	One

Notes:

a. Model: PM 300 or equivalent.
b. Equivalent products from other manufacturers are also acceptable.
c. Please refer to attached Technical Specifications for further details.

PiezoMeter System PM300 Technical Specification

High Precision, Piezoelectric d_{33} Testing System
Measuring d_{33} in four ranges, capacitance and tan δ

Piezoelectric Tests

d_{33} – Very High Range

d_{33} range: 100 to 10,000 pC/N
Accuracy: ± 2% ± 1 pC/N
Loading: 1.0 µF

d_{33} - High Range

d_{33} range: 10 to 1000 pC/N
Accuracy: ± 2% ± 1 pC/N
Loading: 1.0 µF

d_{33} - Low Range

d_{33} range: 1 to 100 pC/N
Accuracy: ± 2% ± 0.1 pC/N
Loading: 1.0 µF

d_{33} – Very Low Range

d_{33} range: 0 to 10 pC/N
Accuracy: ± 2% ± 0.01 pC/N
Loading: 0.1 µF

d_{31} & d_{15}

Adapters are available for various sample geometries, and supplied separately.

Polarity

Sample polarity is indicated for all ranges.

Test Frequency

Frequency Range: 30 Hz to 300 Hz
Setting: steps of: 1 Hz
Accuracy: ± 0.1 Hz

Calibration is at 110 Hz. Other frequencies may be used to tune away from system resonances with large samples.

Force amplitude

Testing is by an oscillatory force, variable by user setting between 0.05 to 0.50 N.

Static force of approximately 10 N used to grip the sample. This may be different for force head units with non-standard suspension (see section on 'Sample Size' below).

Dielectric Tests

Capacitance

Capacitance range: 10 pF to 0.1 µF
Accuracy (< 100pF): ± 2% ± 0.1 pF
Accuracy (> 100pF): ± 2% ± 1 pF
Test frequency: 1 kHz

Tan δ

Tan δ range: 0.0000 to 0.2000
Accuracy: ± 2% ± 0.0001

General Operation

Response Time

d_{33} Only: 5s to 1% of final reading
C and tan δ: 2s to 1% of final reading
d_{33}, C and tan δ: 10s to 1% of final reading

Sample Size

Maximum dimensions:

50 mm in polarisation direction.

68 mm perpendicular (i.e. maximum diameter of a symmetrically supported disc is 136 mm)

Maximum sample mass:

1 Kg with standard suspension.

Different suspension mechanisms can be provided to special order for more massive samples or very thin or soft samples.

Calibration

The system is supplied fully calibrated and tested. d_{33} calibration may be checked using the reference sample provided. In normal use, recalibration is recommended annually.

Calibration may be carried out to customer reference using the remote interface.

Data Storage

The standard PM300 will store up to 100 measurements. All results are numbered and stored along with the test frequency and the measurement range in use.

Data is retained when the PiezoMeter is switched off.

Stand-Alone Operation

40 character by 4 line alphanumeric liquid crystal display showing sample number, d_{33}, test frequency and operation mode. Simple keypad to control all PiezoMeter functions for stand-alone operation.

Printing facility when used directly with standard PC printer, providing tabulated output and statistical analysis.

Remote Operation

The PiezoMeter may be controlled by a computer equipped with Windows. A free serial port, or suitable USB-Serial adapter, is required. All PiezoMeter functions may be controlled.

Remote control software for Windows supplied separately. Also allows real-time calculation of ε_{33}^{T}, g_{33} and g_{31} using sample dimensions supplied by the user.

Remote Interface δ

Industry standard RS-232C interface, configured as data terminal equipment (DTE) using 9 pin D-connector.RS-232 parameters: 9600 baud, 1 stop bit, no parity. Connection is by a standard PC serial file transfer cable (supplied).

Printer Interface

Industry standard parallel printer interface, using 25 pin D-connector, configured as for a standard PC. Connection is by a standard PC printer cable (supplied).

Power supply

220-240V a.c. 50-60Hz 0.5A or
100-120V a.c. 50-60Hz 1A
(Specify with order).

Temperature Limits

Storage: 0°C to 50°C
Operating: 10°C to 40°C
System calibrated: 25°C

Physical dimensions

Electronics unit: 350 x 230 x 90 mm
Force unit: 145 x 150 x 175 mm

Total Unpacked Weight: Approx. 13 Kg
Total Packed Weight: Approx. 20 Kg