

PROCESS TOMOGRAPHY LTD

CAPACITANCE TRANSDUCER TYPE PTL110



The PTL110 capacitance transducer measures small values of capacitance up to 10 picoFarads (pF) and parallel conductance up to 10 microSiemens (uS) in the presence of larger values of stray capacitance to earth. The measurement range can be extended to measure up to 100 pF and 100 uS with slightly reduced accuracy. Sets of both analogue and digital output signals are available..

The transducer uses the charge transfer measurement principle, operating at a switching frequency of 500kHz. The transducer is intended for use with screened capacitance sensors having isolated (unearthed) electrodes. Applications include moisture and product uniformity measurement. The transducer has two sets of analogue and digital outputs which correspond predominantly to the real and imaginary parts of the admittance between the sensing electrodes, expressed as capacitance and conductance. The transducer can be used, in conjunction with a test cell and personal computer, as a calibrated moisture meter using software supplied with each instrument. Optional accessories include an infra-red temperature probe and a range of capacitance cells.

Technical Details

The transducer is connected to the test cell by short lengths of miniature coaxial cable and is largely insensitive to the stray capacitance between the sensor electrodes and earth, and also to the cable capacitance, provided the total capacitance to earth is kept below a specified value. This limits the length of connecting leads to approximately 1.5 metres.

The analogue output signals are direct voltages which increase linearly with the magnitude of the capacitance or conductance between the sensor electrodes. The measurement bandwidth exceeds 1kHz. Two integral 3.5 digit panel meters show the measured capacitance and conductance directly in picoFarads and microSiemens. A variable offset voltage can be applied to each channel of the transducer to remove the effects of any large standing capacitance or conductance via multi-turn controls on the front panel. Alternatively, external offset voltages can be applied to the unit via a connector on the rear panel.

The transducer is housed in a metal instrument case and is mains-powered (230 or 115 V 50/60Hz versions are available).

PTL110 DETAILED SPECIFICATIONS

MEASUREMENT RANGES 10 pF /10uS maximum between sensor plates
(100pF/100uS with use of source level range extension switch)

The stray capacitance between each sensor plate and earth must not exceed 200 pF (including the capacitance between the inner and outer conductors of the coaxial connecting leads). This normally restricts connecting lead lengths to less than 1.5 metres of RG174A/U cable. (RG174A/U cable capacitance is 100pF/Metre).

RESOLUTION: 1 femtoFarad/10 nanoSiemens

SWITCHING FREQUENCY: 500KHz

OUTPUT SENSITIVITY: 1V/pF, 1V/uS (Gain X1) 10V/pF, 10V/uS (Gain X10)

CONTROLS AND INDICATORS

CAPACITANCE AND CONDUCTANCE CHANNELS

GAIN switch X1 or X10

OFFSET ENABLE switch and LED indicator

10-turn OFFSET potentiometer with locking dial mechanism.

SET GAIN multiturn trimmer potentiometer (screwdriver adjustment)

SET ZERO multiturn trimmer potentiometer (screwdriver adjustment)

3.5 DIGIT PANEL METER displaying capacitance in picoFarads/conductance in microSiemens .

MEASURE/CALIBRATE switch

SUPPLY ON switch (on rear panel) and LED indicator (front panel)

SOURCE LEVEL HIGH/LOW switch (rear panel)

INPUT and OUTPUT CONNECTORS (Mounted on rear panel)

Two coaxial input sockets type SMB.

One 5-way 180 degree DIN output socket for capacitance and conductance outputs and external offset voltage inputs ($\pm 10V$).

9-way D connector (female) for digital output to PC serial port.

Two 4mm sockets for infra-red temperature probe (optional)

Fused IEC mains input connector (fuse 2A).

ENCLOSURE Painted metal instrument case with dimensions 255w x 155h X 280d mm
(excluding carrying handle). Weight 5kg.

POWER SUPPLY 230V or 115V versions available, 50 or 60 Hz

For further information, please contact us at the address below or visit our internet web site at:
www.tomography.com.

PROCESS TOMOGRAPHY LTD

86 Water Lane, Wilmslow, Cheshire. SK9 5BB United Kingdom.

Phone/Fax +44 (0)1625 549021

email: enquiries@tomography.com Website: www.tomography.com

Registered in England No. 2908507. Registered Office 15, Croft Road, Wilmslow, Cheshire. SK9 6JJ United Kingdom.

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