PRECISION PULSE RESISTIVITY MEASUREMENT SET-UP

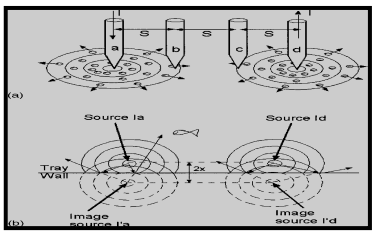
(A.C./D.C./PULSE)

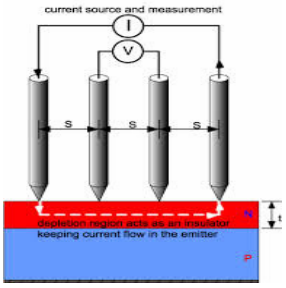
Introduction:

Precision pulse resistivity analyzer are available in 8 different regular models apart from tailor madels (two/three point/four points) solutions virtually covering all industrial and research applications meeting all electrical, thermal, mechanical, and environmental specifications. These pulse resistivity analyzer has in-built variable frequency excitation power source to measure high resistivity sample impedence measurement elimination polarization effect of samples with target electrode. These meters are first choice for online measurement of sample resistance (A.C./D.C.). These finds applications in generation, transmission/distribution, defense, electrical/mechanical m/c testing instrument, industrial electronics, railway, and avionics and solid state physical application like dielectrics characterization, switch gears, lectrochemical,thermodynamical application,MEMS and many research and development activities. These precision instruments are compatible to any standard external current/voltage sensor and power source of specification as specified under.

Operating Principle: Resistivity includes namely 1.Target conductor 2. Connection between the target & conductor and the target electrode. To measure this resistivity Following technique is used…

MPET-0009991





(four-point conductivity measurement profile)

Four point conductivity measurement system:

The 4-point method requires the insertion of four equally spaced and in-line electrodes into the test area. A known current from a constant current generator is passed between the outer electrodes. The potential drop (a function of the resistance) is then measured across the two inner electrodes. The Model MPET-9999990101 are calibrated to read directly in ohmscm

V/I : current and potential drop t = sample thickness,s= distance between electrode

p= sample resistivity, pie = 3.14(nepier constant)

$$\rho = \frac{V}{I}\frac{\pi t}{ln\left(\frac{sinh\left(\frac{t}{s}\right)}{sinh\left(\frac{t}{2s}\right)}\right)}$$

Benefits:

- High input impedence/Low input biased current /higher accuracy/.
- 5-1/2 & 6-1/2 digit display /consistent performance over large temperature/humidity range (70°C and 80 % RH)
- Scaled directly in micro ohm - ohm to giga micro-ohm range instrument repeatable accuracy.
- Auto/manual zero offset without drift. /Auto drift tracking
- RS-32 interface/high sample rate – 10,000 sample/second. / Feed back current measurement technique.
- Safety compliance-IE-1956 or as communicated/ inbuilt variable frequency excitation to get noise free reading in high resistivity area.
- Inbuilt climatically temperature/pressure compensated.

PULSE RESISTIVITY ELECTROMETER D.C./A.C. **$999999x10^{-9}$<resesistivity<$999999x10^{+12}$ ohm.cm**

Model	Range Volt	Range Resistivity Ohm-c.m.	Pulse Frequency	Burdon Micro-volt	Accuracy limted to Resolution	Resolution quantified	Voltage/current source
MPRA-9999990101	10.0/5.0 -999999Nv 1.0 mV-10.0Volts	05.0/02.0 -999999 mili -ohm.cm 0009999-0999999 -ohm.cm	0-50K.Hz	< 100	99.99999%	1/2/5 counts	0050 V/001.0 A
MPRA-9999990401	10.0/5.0 -999999Nv 1.0 mV-20.0Volts	05.0/01.0 -0999999 micro.ohm. 0000.000-099.999 -k.ohm.cm	0-50 k. Hz	< 100	99.99999%	1/2/5 counts	0100 V/001.0 A
MPRA-9999990102	05.0/1.0 -999999Nv 1.0 mV-10.0Volts	05.0/02.0 -099.999 micro-ohm.cm 00.000-099.999 mega-ohm.cm	0-50K.Hz	< 100	99.99999%	1/2/5 counts	0200 V/001.0 A
MPRA-9999990402	05.0/1.0 -999999Nv 1.0 mV-20.0Volts	05.0/01.0 -999.999 micro.ohm. 0.000-999.999 -Giga-ohm.cm	0-50 k. Hz	< 100	99.99999%	1/2/5 counts	0500 V/001.0 A
MPRA-9999991002	05.0/1.0 -999999Nv 1.0 mV-99.9Volts	05.0/02.0 -999.999 mili -ohm.cm 000.000-99.9999 -k.ohm.cm	0-50k.Hz	< 100	99.99999%	1/2/5 counts	1000 V/001.0 A
MPRA-9999992002	05.0/1.0 -999999Nv 1.0 mV-199Volts	05.0/01.0 -999999 micro.ohm. 000.000-999.999 -mega..cm	0-50 k. Hz	< 100	99.99999%	1/2/5 counts	3000 V/001.0 A
MPRA-9999992003	05.0/1.0 -999999Nv 1.0 mV-199Volts	05.0/02.0 -999999 micro.cm 000000-999999 -giga.ohm.cm	0-50 k. Hz	< 100	99.99999%	1/2/5 counts	5000 V/010.0m A

Six digits after product code indicate count; next, two digits indicate voltage and last digit indicate. 01- nano amp/02-pico amp/03-femto amp.

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PRECISION PULSE RESISTIVITY MEASUREMENT SET-UP

(A.C./D.C./PULSE)

Specifications OF Ultra-precision High Currenr/Low voltage sources: source range : upto 3.00000 amps at 20 and 30 volt

Model	Compliance voltage	Source Current	Accuracy limted to Resolution	Resolution quantified	Accuracy limted to Resolution	Stability/1.0 hour	Stability/24 hour
MHCLS-200002	20.0000	2.00000	99.999%	1/2/5 counts	99.99999%	3-10 count	5-15 count
MHCLS-203002	20.0000	2.00000	99.999%	1/2/5 counts	99.99999%	3-10 count	5-15 count
MHCLS-200002	20.0000	3.00000	99.999%	1/2/5 counts	99.99999%	3-10 count	5-15 count
MHCLS-200002	20.0000	3.00000	99.999%	1/2/5 counts	99.99999%	3-10 count	5-15 count
MHCLS-300004	30.0000	2.00000	99.99999%	1/2/5 counts	99.99999%	3-10 count	5-15 count
MHCLS-300002	30.0000	2.00000	99.99999%	1/2/5 counts	99.99999%	3-10 count	5-15 count
MHCLS-302002	30.0000	3.00000	99.99999%	1/2/5 counts	99.99999%	3-10 count	5-15 count
MHCLS-300002	30.0000	3.00000	99.99999%	1/2/5 counts		3-10 count	5-15 count
MHCLS-303002	30.0000	3.00000	99.99999%	1/2/5 counts	99.99999%	3-10 count	5-15 count

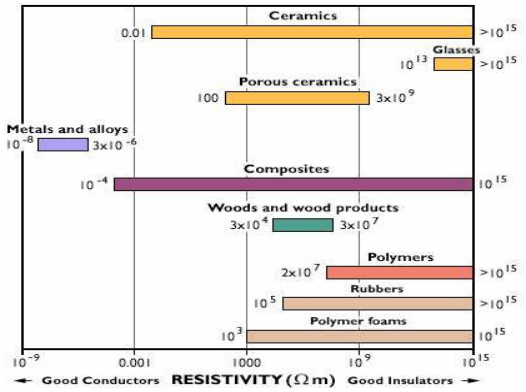
General electrical & mechanical specification of Precision Power source :

Operating voltage : 330 volts, 1phase, 40-60 Hz
Output current/voltage: as in data sheet (linear/pulse) AC/DC
Voltage/current control accuracy: 99.9999% of set point or better for CC/CV
Ripple: 0.000001% of set point for voltage/0.000001% for CC or optional/ma be modified
Voltage regulation: Line: ±0.01%+ 3.0 m.v. (for ±10% of input change)/ Load: ±0.01%+ 3.0 m.v. (for 10 to 100% of Load change)
Current regulation: Line: ±< 0.05%+ 0.1 m.a. (For ±10% of input change)/Load: : ±< 0.05%+ 0.1 m.a. (for 10 to 100% of Load change)
Display Resolution: 1/5 nV & 1/5 nano amps or1/5 nV & 1/5 pico-amp or optional and may be altered based on time behaviour of signal
Range (V/I): Voltage: 10^{-09}-10^{-04} volt/10^{-4}-10^{+1} volt least count- 5.0 nano volt
Current: 10^{-13}-10^{-07} amp/10^{-7}-10^{-3} amp least count- 5.0 pico ampere or optional
Resistivity: 10^{-13}-10^{-07} ohm.cm/10^{-7}-10^{-3} ohm.cm/10^{-3}-10^{+2} ohm.cm
Accuracy error: 0.0000001% of set volts for (CV mode/0.0000001% of set current (CC mode)
Step down ratio : 0-1000000 or option
Temperature coefficient of variation: < 10^{-9}ppm
Control options 1.cascade feedback control with soft start / 3. Constant voltage mode with external adjustment.
Display $5_{1/3}$ &$6_{1/3}$ digit LED display
Other option: D.C./A.C./PULSE (100-10000 Pulse/sec)
Protection : over voltage/short ckt
Option: These power supplies may offer in pulse mode.
Interface: RS-333/U.S.B.

Dimension of Precision Power Spplies

MHCLS-001003	08X06X06	MHCLS-013003	13x10x10	MHCLS-050003	14X13X13	MHCLS-300004	14X13X13
MHCLS-003003	08X06X06	MHCLS-013004	13x10x10	MHCLS-050004	14X13X13	MHCLS-300008	14X13X13
MHCLS-006003	08X06X06	MHCLS-013008	13x10x10	MHCLS-050008	14X13X13	MHCLS-400005	14X13X13
MHCLS-006003	13x10x10	MHCLS-013015	13x10x10	MHCLS-100015	14X13X13	MHCLS-400010	14X13X13
MHCLS-006004	13x10x10	MHCLS-013030	13x10x10	MHCLS-100001	14X13X13	MHCLS-800005	14X13X13
MHCLS-013001	13x10x10	MHCLS-035003	13x10x10	MHCLS-100003	14X13X13	MHCLS-800010	14X13X13
MHCLS-001003	13X10X10	MHCLS-013003	13x10x10	MHCLS-050003	14X13X13	MHCLS-150010	14X13X13

.Three numerals after MHCLS indicates voltage of power supply and last three digit Indicates current. All dimensions are in inches.



Four point resistivity analyzer set-up

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