

SIWE nr.: 169	DC-Potentiometer P3
Doel:	Nauwkeurige meetbrug voor het meten van spanningen, stromen en weerstanden
Type:	P3 serienummer 21248
Foto	 <p>The image shows a wooden carrying case for the DC-Potentiometer P3. The instrument panel is light grey and features a central galvanometer with a scale from 0 to 10. To the left of the galvanometer is a '2 VOLTS' section with a 'CROICO' brand galvanometer and a 'SHORT GALV. WHEN NOT IN USE' switch. To the right of the galvanometer is a 'POTENTIOMETER' section with two large red knobs, a 'RHEOSTAT' knob, and a 'MULTIPLY POTENTIOMETER AS' knob. The panel also includes several terminals for 'STD. CELL', 'BATT', and 'GALV. SERIES RESISTANCE OHMS'. The instrument is labeled 'TYPE P3' and 'CROYDON PRECISION INSTRUMENT CO. MANUFACTURED IN ENGLAND'.</p>
Bouwer:	Croydon Precision Instrument Co Engeland invoerder; Drua Brussel
Bouwjaar:	1954 of 1963
Afkomst:	VUB Brussel
Afmetingen:	BxDxH: 50x35 x 18 cm
Gewicht:	11 kg
Materiaal	Houten kast, metalen, elektrische componenten
Werkwijze:	zie blad 2 Bij een potentiometermeetbrug wordt de waarde niet op de galvanometer afgelezen, maar op de instellingen van de weerstand, de galvanometer dient voor het nauwkeurig instellen van het nulpunt.
Staat	goed, alleen 2 ^{de} batterij ontbreekt
Nwe bestem.	
Opmaak:	A.B. op 28.11.2010 - laatste aanpassing: 28.11.2010 e-mail: alex.baerts@skynet.be

Operating Instructions

Place the Varley type V40 accumulator into the battery compartment and connect to the spade tags. This should be done 2 to 3 hours before use to ensure that the potentiometer current will be stable. The battery leaves our factory in a charged condition but over a customer's time, are advised to charge before use.

Please note that the battery supplies the galvanometer projector as well as the potentiometer, and whilst the battery supplied instrument is being used in a portable form, for permanent set-ups in the factory or laboratory we would recommend the use of a battery for the potentiometer current, and a transformer for the lamp supply, or Type P3.5 mains operated potentiometer supply unit.

Remove link shorting the galvanometer terminals, and replace between the galvanometer and potentiometer terminals.

Set the galvanometer zero by means of the coarse and fine controls on the galvanometer panel. The coarse control is effected by turning the knob which appears through a hole in the front of the scale, and the fine adjustment is made by rotating the knurled knob with which it is possible to make adjustments by movement of the galvanometer scale. The galvanometer scale movement is in millimetres.

Standardisation

To make the potentiometer read accurately in volts it is necessary to standardise the instrument against the internal standard cell as follows. Set the selector switch in the top right hand corner of the instrument to the STD. CELL. position, and with the GALV SERIES RESISTANCE selector in the 10⁰ position, press the galvanometer key and rotate the knob marked RHEOSTAT until the galvanometer balances at zero.

Repeat this on all other positions of the GALV SERIES RESISTANCE switch until the galvanometer balances at zero in the 0 position of maximum sensitivity. The instrument is now standardised and ready for use.

Note: The instrument can be standardised irrespective of dial or range plug setting.

Measurement

Connect the voltage to be measured to terminals 1 or 2, making sure that the polarity is correct. Set the test position selector switch in the 10⁰ position, in the appropriate position 1 or 2.

Select the range required by means of the plug switch engraved "MULTIPLY POTENTIOMETER READING BY". This plug should be in the selected position.

Range of Measurement

- × by 1 1.8 volts to 0.5 millivolts.
- × by 0.1 0.18 volts to 50 microvolts.
- × by 0.01 0.018 volts to 5 microvolts.

With the GALV SERIES RES switch in the 10⁰ position press the galvanometer key and adjust the two voltage measuring dials until the galvanometer balances at zero, repeat on all positions of the sensitivity control until balance is obtained at maximum sensitivity.

Note: When the galvanometer spot is deflected toward the operator's right hand the knobs of the voltage measuring dials should be rotated in the direction or vice versa.

Storage

Store with panel horizontal, in this position the standard cell is upright.

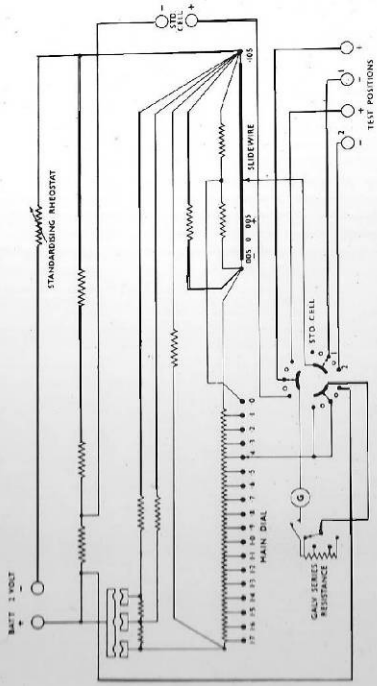
Maintenance

Replacement of projector lamp: Remove all connections to the galvanometer unit, and the screws which are underneath the unit of the wood case. The complete galvanometer unit can then be withdrawn.

Remove the two knurled screws at the rear of the projector, withdraw bulb unit and replace bulb. Replace the bulb holder and the knurled screws, then adjust the position of the ebonite bulb holder until the bulb filament is focused on the galvanometer mirror. The lamp type 2.5 volts 0.3 amp M.E.S. Two spare bulbs are to be found on the base plate inside the galvanometer unit.

The only other servicing that the instrument requires is the cleaning and lubrication of the switches, rheostat and slide-wire; this should be done annually as follows:—First, remove all the potentiometer connections, and knobs. The knobs are grub screwed to the switch shafts and one of the screws is tapered to give correct location and firm fixing, also each knob is numbered and the number will correspond with the top of each switch spindle.

Secondly, unscrew the five 2BA chromium plated screws securing the top panel, which can then be removed and clean and polish all the contact surfaces with a chamfered leather or non-fluff, soft, and re-lubricate with good quality contact oil such as "Shoebol". **Caution:** Servicing should be carried out by an experienced instrument mechanic as any disfigurement of the contact surfaces of the slide-wire will seriously affect the satisfactory operation of the potentiometer.



PORTABLE D.C. POTENTIOMETER

TYPE P3.

Voltage Measurement

Potential differences up to 1.8 volts can be measured directly on the potentiometer, and the indication in the circuit of a voltage ratio box of type V.R.B.1 will extend the range of measurement to 600 volts, or by V.R.B.2 up to 2,400 volts.

As seen from Fig. 2, voltmeters are calibrated by connecting them across the volt ratio box, the applied voltage varied, and a number of potentiometer readings taken at various points on the voltmeter scale.

Current Measurement

A standard resistance type R.S.1 or type R.S.2 of suitable value is connected in the circuit in which the current is to be measured. The resistance is chosen so that the current produces across its terminals a p.d. of convenient value. For maximum accuracy of measurement we would suggest a p.d. of 1 volt.

Ammeters are calibrated by connecting them in series with a standard resistance, varying the current through them and taking potentiometer readings at various points on the scale.

Resistance Measurement

The resistance to be measured is connected in series with a standard resistance of similar value, a steady current is maintained in the circuit, and the p.d. compared on the potentiometer.

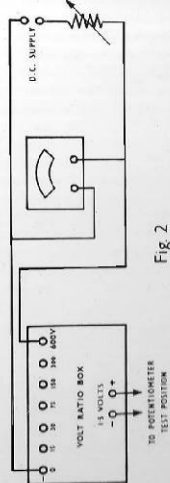


Fig. 2

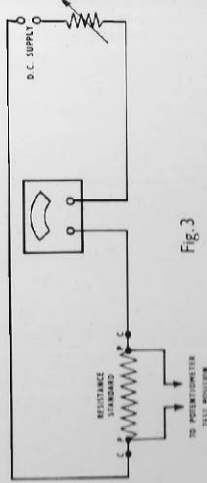


Fig. 3

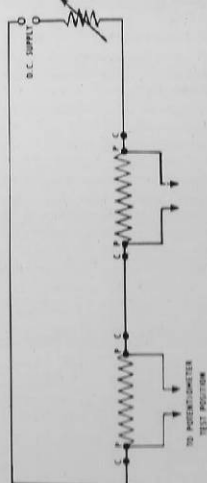


Fig. 4