

INSTRUCTION MANUAL

DIGITAL PSC-LOOP TESTERS

**MODEL KMP 4116DL, KMP 4118DL,
KMP 4120DL**

ROBIN

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IMPORTANT

The KMP4120DL unit incorporates the unique Robin patented D-Lok circuits designed to electronically by-pass most RCD's at Distribution Boards. This saves time and money by not having to take the RCD out of circuit during testing and is a safer procedure to follow.

The D-Lok circuits may not by-pass some RCD's and this will result in the RCD tripping out as they would do with a conventional loop tester. Also, in the case of high sensitivity RCD's rated at 10mA or less the D-Lok circuits may not function. If there is doubt as to whether this tester will by-pass a particular RCD, please contact Robin Electronics with details of manufacturer, model no., rating and sensitivity.

Remember, please read this instruction manual carefully before using this tester.

For those units with D-Lok, the RCD may be inoperative during the test period.

1. WARNING

- 1.1 This instrument must only be used by a competent, trained person and operated in strict accordance with the instructions. Robin Electronics will not accept liability for any damage or injury caused by misuse or non-compliance with the instruction or safety procedures.
- 1.2 It is essential to read and understand the safety rules contained in the instructions. They must always be observed when using the instrument.
- 1.3 This instrument is only intended for single phase operation, 230V AC $\pm 10\%$ phase to earth or phase to neutral operation. It must **never** be connected phase to phase — damage will result.
- 1.4 When conducting a test, particularly on earth spikes, do not touch any exposed metal work. This is because the earth has a current flowing through it for the duration of the test (approx 20 ms).
- 1.5 **Never open the instrument case** — there are dangerous voltages present. Only trained competent Electronic Engineers should open the case. Please send the unit back to Robin Electronics Ltd if a fault develops.
- 1.6 This instrument is primarily protected by HRC Ceramic fuses. DO NOT ATTEMPT to replace them if they fail. Should they fail please contact Robin Electronics Ltd.
- 1.7 If the overheat symbol appears in the display () disconnect the instrument from the mains and allow to cool down.
- 1.8 For those testers without the D-Lok circuitry (models KMP 4116DL, KMP 4118DL) all RCD's (RCCB, ELCB) in the circuit must be by-passed for the duration of the test. Do **not** operate the RCD Test Button with the RCD by-passed.
- 1.9 This unit is designed to give minimum "splash" when connecting to an earth point using the external earth probe. To reduce this effect further, always connect the probe in a firm and positive manner.

- 1.10 If abnormal conditions are suspected (e.g. faulty display, anomalous readings, broken case, cracked leads etc.) do not use the tester and return it to Robin Electronics.
- 1.11 External Earth Probe. The tip is at mains potential (low current). Be careful to keep your hands behind the finger guard and make a firm and positive contact with the surface to be tested.
Always keep your hands and fingers behind all finger guards on test leads used with this meter.
- 1.12 If the unit does not power up check the leads for damage (e.g. blown fuse). Never assume an installation/circuit is not live.
- 1.13 If at anytime during testing there is a momentary degradation of reading, this may be due to excessive transients or discharges on the system or local area. Should this be observed, the test should be repeated to obtain a correct reading. If in doubt always contact Robin Electronics.
- 1.14 For safety reasons always only use accessories (e.g. leads, probes, fuses, cases etc) recommend by Robin as they are designed to work with the tester. The use of any other items is prohibited as they may not have the same safety features built in.

2. Features

- Model KMP4120DL with unique D-Lok circuit avoids the need to by-pass most RCD's
- Large custom high contrast display
- Auto lock out if test resistor overheats
- Voltage indication
- Microprocessor controlled
- Models KMP4120DL/KMP4118DL measure PSC
- Measure low loop with 0.01 Ω resolution
- High loop ranges permit measurement of ground spikes
- Bright colour coded LED mains status indicators
- Distribution board lead included as standard on model KMP4120DL/KMP4118DL

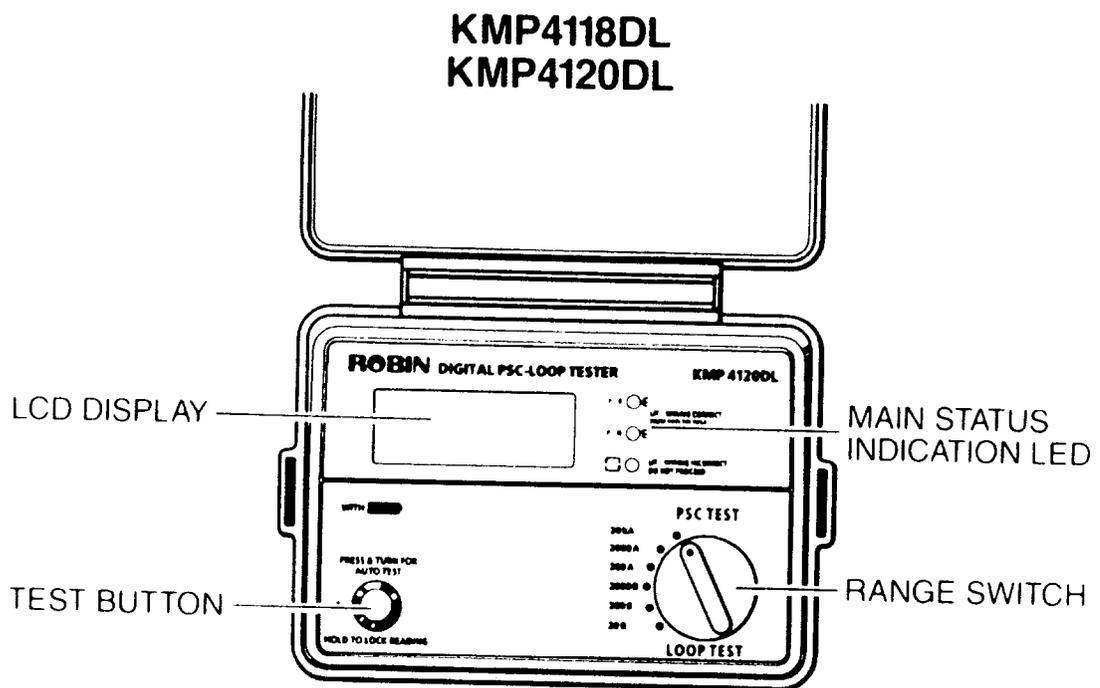
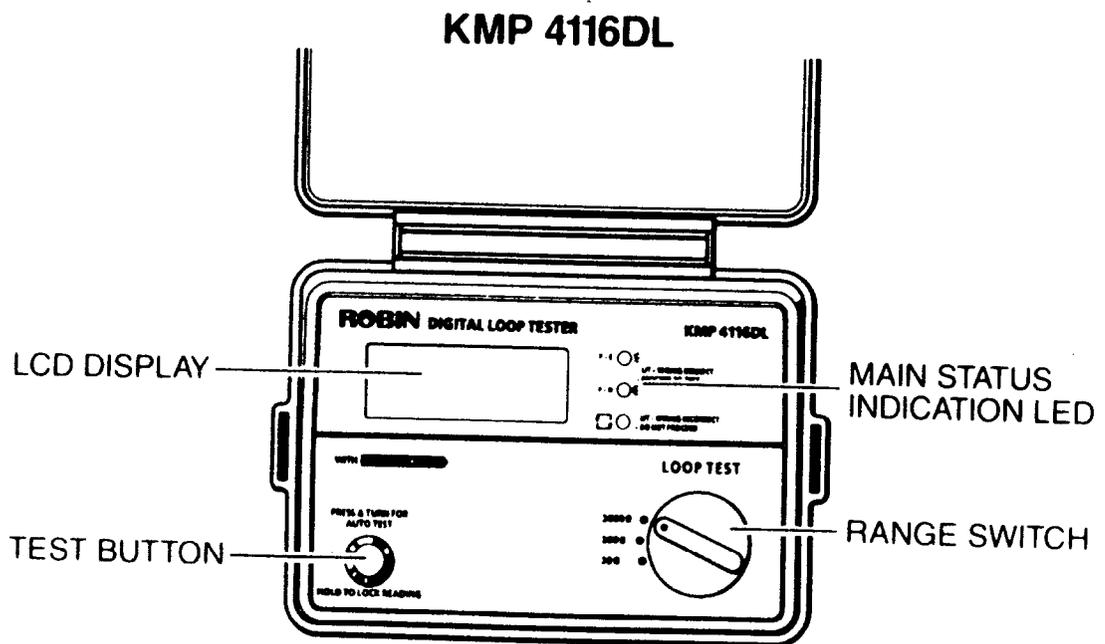
3. Specifications

Rated Voltage:	230V \pm 10% 50Hz
Operating Temperature:	0°C to 40°C
Storage Temperature:	-5°C to 60°C
Operating Humidity:	85% Maximum
Storage Humidity:	85% Maximum
Accuracy of Mains Voltage Display:	\pm (2% +2D)
Accuracy (Loop Impedance):	\pm (2% +3D)
General Dimensions	175×115×85.7mm approx.
Weight:	KMP4116/KMP4118=440g KMP4120=610g
Test Current:	25A approx. (20 ohm range)
Display:	3 1/2 Digit custom LCD
AC Test Period:	2 half cycles of AC (20ms)
Display Hold on Mains Loss:	Approx 1 second
Over Range Indication:	"1" and "↑" on display
Over Temperature Indication:	"1" and "↓" in display
Accessories:	Mains Test Lead with IEC Connector KAMP10 Earth Probe SLP5 Carrying Pouch for leads Distribution Board Lead SL16E (fused 10A/440V/20kA fast acting ceramic)

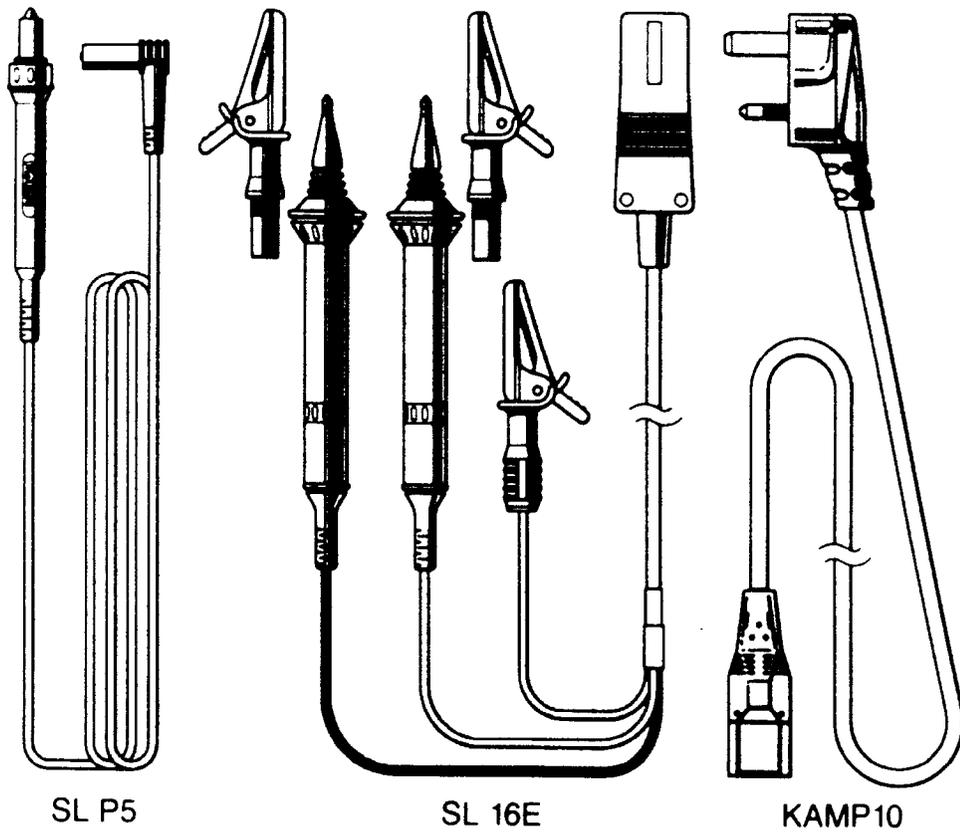
Model	KMP4120DL	KMP4118DL	KMP4116DL
D-Lok Circuit*	✓	×	×
Loop 0-19.99Ω/ 199.9Ω/0-1999Ω	✓	✓	✓
PSC 0-199.9A/ 0-1999A/0-19.99kA	✓	✓	×
Mains Lead for Sockets KAMP10	✓	✓	✓
External Earth Probe SLP5	✓	✓	✓
Distribution Board Lead SL16E	✓	✓	×

* D-Lok does not operate on the 2000Ω/20kA ranges

4. Instrument Layout



TEST LEAD



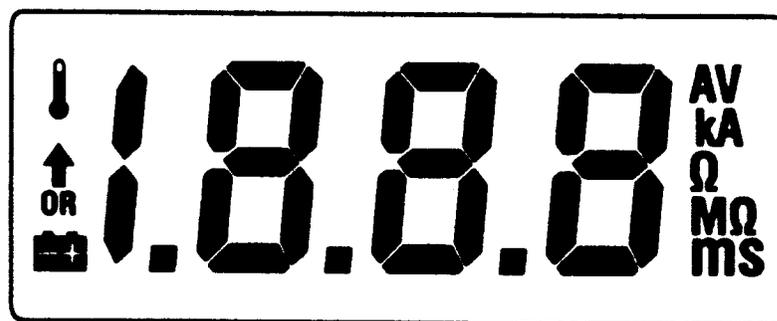
SL P5

SL 16E

KAMP10

EXTERNAL
EARTH PROBE

LCD DISPLAY



5. Operating Instructions

- 5.1 **Initial Checks** — To be carried out before any testing.
- Always inspect your test instrument and lead accessories for abnormality or damage. If abnormal conditions exist **DO NOT PROCEED WITH TESTING**. Have the instrument checked by Robin Electronics.
 - Before pressing the test button, always check the LED's for the following sequence: —
P-E Green LED must be ON
P-N Green LED must be ON
Red LED must be OFF
If the above sequence is **NOT** displayed or the **RED** LED is on for any reason, **DO NOT PROCEED AS THERE IS INCORRECT WIRING**. The cause of the fault must be investigated and rectified.
 - **Voltage Measurement**
When the instrument is first connected to the system, it will display the phase-neutral voltage which is updated every 0.5s. This mode is cancelled the first time the test button is pressed. If this voltage is not normal or as expected, **DO NOT PROCEED**.
NOTE: This is a single phase (230V AC) instrument and **under no circumstances** should it be connected to 2-phases or a voltage exceeding 230V $\pm 10\%$.

5.2 MEASUREMENT OF LOOP IMPEDANCE

a. Loop Impedance at Mains Socket Outlet

- Select the 20 Ω , 200 Ω or 2000 Ω range as desired
- Connect the mains lead to the IEC socket of the instrument
- Plug the moulded plug of the mains lead into the socket to be tested
- Carry out the initial checks
- Press the test button. A beep will sound as the test is conducted and the value of loop impedance will be displayed
- Wait for the display to clear to zero before conducting another test or before disconnecting the instrument from the socket

If the display shows "1 [↑]OR" then this usually means the value measured exceeds the range selected, e.g. if the 20 Ω range was selected then the loop impedance is greater than 19.99 Ω and you must switch up a range to the 200 Ω range.

5.2.1 External Earth Probe

The phase-earth loop impedance of exposed metalwork (e.g. pipes/conduit etc.) can be tested using the external earth probe.

Connect the unit to the socket as normal. Plug the external earth probe into the instrument external earth probe socket, ensuring the probe is held with fingers behind the finger guard. This will break the earth continuity at the socket and the red LED will switch on. The point at which the probe is now connected becomes the new earth point instead of at the socket. When the probe is placed in contact with the earthed surface to be measured, the LED mains status should revert to the correct sequence described in initial checks. When this happens, press the test button to measure the loop impedance.

b. **Loop impedance at the distribution board**

[WARNING: NEVER CONNECT 2 PHASES]
[TO THIS INSTRUMENT]

- Select the 20 Ω , 200 Ω or 2000 Ω range as required
- Connect the distribution board lead model SL16E to the IEC socket on the instrument
- Connect the red phase lead of the SL16E to 1 phase of the distribution board, the black neutral lead to the neutral of the distribution board and the green crocodile clip to the earth
- Carry out the initial checks
- Press the test button. A beep will sound as the test is conducted and the value of loop impedance will be displayed
- Wait for the display to clear to zero before conducting another test or disconnecting from the distribution board. When disconnecting from the distribution board, it is good practice to disconnect the phase first

c. **Loop impedance at 3-phase equipment.**

Use the same procedure as (b) ensuring only

1-phase is connected at a time i.e.: —

FIRST test-red prod to phase 1, black prod to neutral, green crocodile clip to earth;

SECOND test-red prod to phase 2, black prod to neutral, green crocodile clip to earth etc.

d. The SL16E can also be used for testing at luminaires

Testing as described in (a), (b), (c) and (d) will measure the Phase-Earth loop impedance. If you wish to measure the Phase-Neutral loop impedance in items(b), (c), (d), then same procedure should be followed except the earth clip should be connected to the neutral of the system i.e. the same point as the black neutral probe.

If the system has no neutral then you must connect the black neutral probe to the earth i.e. same point as the green earth clip. This will only work if there is no RCD in this type of system.

5.3 Measurement of PSC (prospective Short Circuit Current) (models KMP4120DL/4118DL)

[WARNING: NEVER CONNECT 2 PHASES]
[TO THIS INSTRUMENT]

This is normally measured at the distribution board between the **phase and neutral**.

- Select the 20 kA, 2000A or 200A range
- Connect the SL16E distribution board lead to the IEC socket on the instrument
- Connect the red phase probe of the SL16E to the phase of the system, the **black probe to the neutral of the system** and the **green crocodile clip to the neutral of the system**
- Carry out the initial checks
- Press the test button. A bleep will sound as the test is conducted and the value of PSC will be displayed
- Wait for the display to clear to zero before conducting another test or disconnecting the instrument. It is good practice to disconnect the phase lead first

Note: For loop impedances greater than 50Ω (PSC less than 5A approx.) it is not possible to obtain an accurate PSC reading and the unit will lock out the PSC range by displaying the \uparrow _{OR} overrange symbol.

If the PSC ranges are selected whilst connected to a socket outlet via the mains lead KAMP10, a test will take place between Phase and Earth due to the fixed wiring of the moulded mains plug i.e. a **Phase-Earth fault current** test.

5.4 **GENERAL**

- 5.4.1 If the "1  " symbol appears, this means that the test resistor is too hot and the automatic cut out circuits have operated. Allow the instrument to cool down before proceeding. The overheat circuits protect the test resistor against heat damage.
- 5.4.2 The test button may be turned clockwise to lock it down. In this auto mode, when using distribution board lead SL16E, tests are conducted by simply disconnecting and reconnecting the red phase prod of the SL16E avoiding the need to physically press the test button i.e. "hands free".

6 Servicing and Calibration

If this tester should fail to operate correctly, return it to Robin Electronics marked for the attention of the Service Department, stating exact nature of fault. Make sure that: —

- a. operating instructions have been followed
- b. leads have been inspected
- c. the unit is returned with all accessories

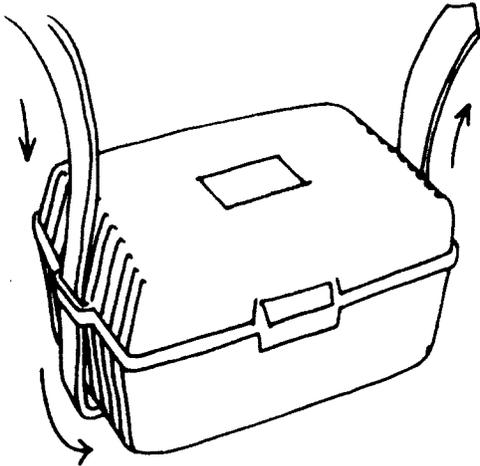
Regular re-calibration is recommended for this instrument. We recommend that with normal use, the instrument is calibrated at least once in every 12 month interval. When this is due for re-calibration return it to Robin Electronics marked for the attention of the Calibration Department and be sure to include all accessory leads, as they are part of the calibration procedure.

Robin Electronics Ltd
Precision Centre
Dwight Road
Watford
Herts
WD1 8HG

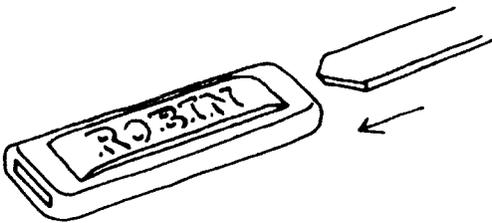
Robin reserve the right to change specifications and design without notice and without obligation.

CASE, STRAP, SHOULDER-PAD AND TEST-LEAD POUCH ASSEMBLY

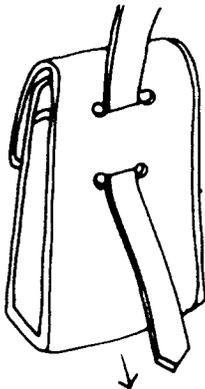
Assemble the shoulder strap through the case lugs and the test-lead pouch in the following sequence:



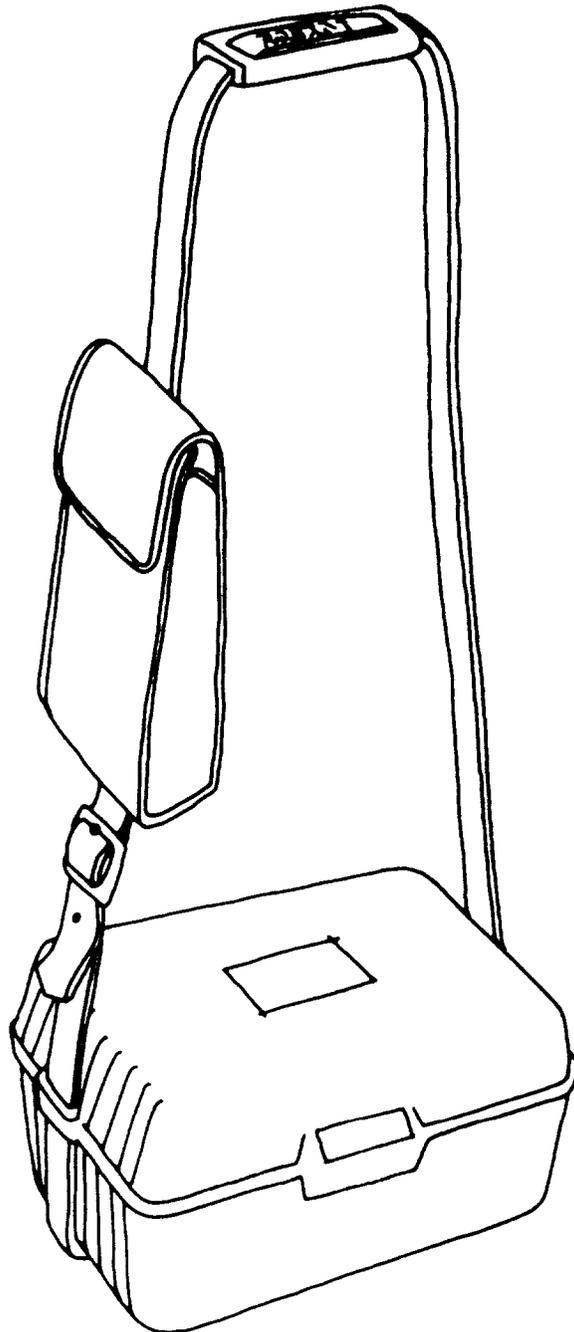
- 1 Pass the strap DOWN through the first case lug, under the case and UP through the other lug.



- 2 Slide the shoulder-pad onto the strap.



- 3 Feed the strap DOWN through the slots in the back of the test-lead pouch.



- 4 Pass the strap through the buckle, adjust the strap for length and secure.

Quality and reliability is our tradition

DISTRIBUTOR

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