

# Automatic RCL Meter

PM 6303



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## PM 6303 Automatic RCL Meter

- Easy-to-read LCD display
- Extremely fast automatic operation
- Displays component value, measurement units and equivalent circuit
- All displays appear simultaneously
- Push-button selection of nine different parameters
- Two- or four-wire connection
- SMD Testing via Optional Test Attachment

### Fast Operation, Clear Display

The PM 6303 automatic RCL meter will rapidly determine the value, electric dimension and equivalent circuit of passive components to a very high order of accuracy, and over a wide range. The measured value, together with the appropriate unit of measurement and the equivalent circuit-graphics, are easily read on a large 4-digit liquid crystal display.

### Rapid Connection

Connection of a component to be tested is quick and simple, using either a two- or four-wire connector or an optional test attachment. Less than one second after connection, the dominant component's measured value, its effective dimension and its equivalent circuit will be clearly displayed. For example: when measuring a coil having a Q-factor of 1, both the series inductance and resistance and the equivalent circuit-graphics will be displayed almost instantly. Apart from using the auto mode of the PM 6303, it is possible to select from a maximum of nine differing parameters (D, Q, Rp, Rs, Z, Ls or Lp, Cs or Cp and Cs 2V bias), using only two push-buttons.

### Universal Capability

Features like these make the PM 6303 an ideal instrument for a very wide range of applications; educational institutes, R & D laboratories, specialized service centers, or in general-purpose workshops. Its automatic operation, coupled with a direct digital readout, also makes the PM 6303 a most attractive tool for use in research, development, and quality-control. Plus manufacturing engineers will find the PM 6303 a most useful aid in batch-sampling techniques.

#### Connection Facilities Include:

- 2 sockets for measuring voltage (HI) Drive and Sense connection
- 2 sockets for measuring current (LO) Drive and Sense connection
- 1 socket guard connection

#### Parameter Selection

- 2 push-buttons for stepping from item to item in the parameter menu.
- 1 push-button to reset to RCL auto mode in which the dominant component is measured.

### Parameters

- Dominating component R, C or L (autoselection)
- Q
- D
- Rp
- Rs
- Z
- Cp, Lp
- Cs, Ls
- Cp Biased (internally generated DC voltage)

### Optional Accessories

When making measurements of already mounted components, connection between the PM 6303 and the component to be tested would be difficult. The problem is easily overcome by the use of the 4-wire test cable PM 9541. This consists of a cable fitted at one end with Kelvin clips, the other end fitted with a Kelvin connector which plugs into the front panel socket on the PM 6303.

In addition, and especially useful for testing batches of individual components of all different physical sizes, there is the 4-wire RCL adapter, PM 9542. This is a box-mounted set of 'slide-in' connectors having a similar cable end to the PM 9541.

Also available is a fixture for all types of Surface Mounted Devices (SMDs). Designated the PM 9542SMD, it plugs into the PM 9542 and allows measurement on and testing of all shapes and sizes of SMDs. A direct readout of the component type and value is displayed on the PM 6303, together with a display of the equivalent-circuit symbol for the component. As for other components, a 4-wire technique is used for measurement, ensuring high accuracy even for low-impedance components.

All three accessories may be seen on the following page.

## Specifications

### Technical Specifications

#### General

- Display:** Large 18 mm, 4-digits LCD
- Dimension Indications:**  $\Omega$ , k $\Omega$ , M $\Omega$ , pF, nF,  $\mu$ F, mF,  $\mu$ H, mH, H, kH
- Out of Range Indication:** 4 middle digit segments flashing




#### Measuring Ranges

- Resistance:** Rp, Rs, Z 0.000 $\Omega$  to 200 M $\Omega$
- Capacitance:** Cp, Cs 0.0 pF to 100 mF
- Inductance:** Lp, Ls 0.0  $\mu$ H to 32 kH
- Quality Factor:** Q 0.002 to 500
- Dissipation Factor:** D 0.002 to 500 manual





#### Maximum Resolution Per Range

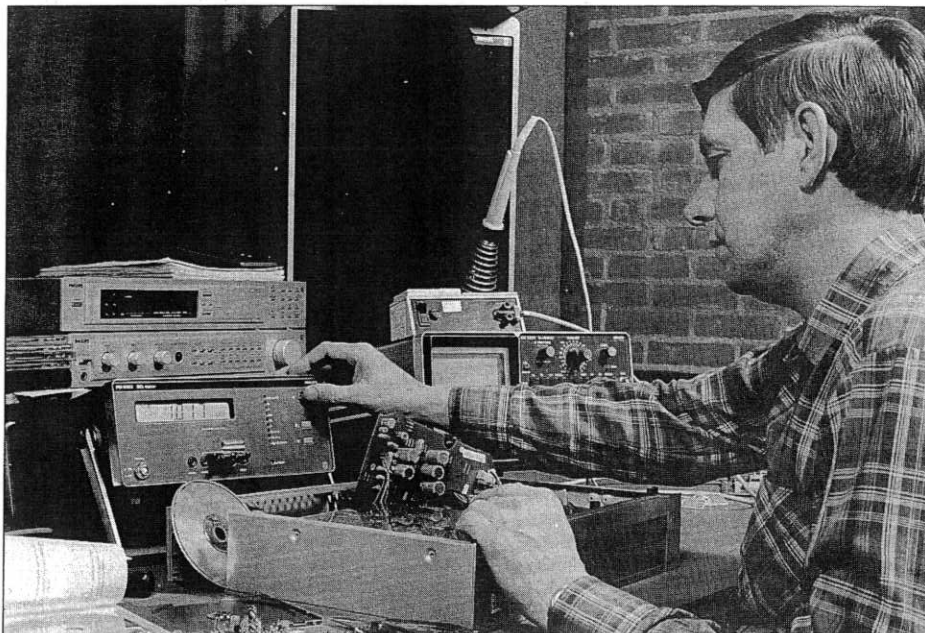
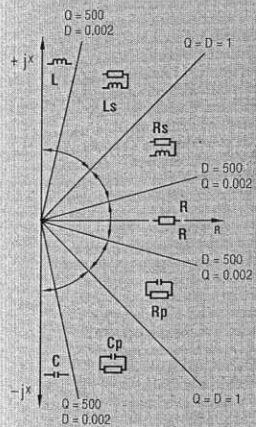
- Resistance:** 1 m $\Omega$
- Capacitance:** 0.1 pF
- Inductance:** 0.1  $\mu$ H

**Equivalent circuits**  
-7 Equivalent circuits

-   $D > 500$
-   $D < 0.002, Q > 500$
-   $Q > 500$ , no display of the secondary parameter

D or C  
Q=D=1      parameter selection

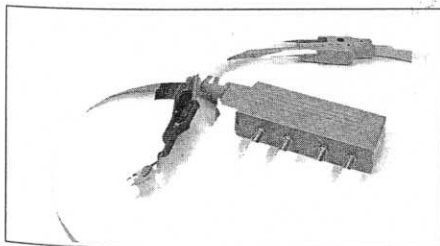
-  500      RCLAUTO, Cp, Rp, D, Z
-  500      Cs, Rs
-  500      RCLAUTO, Ls, Rs, Q, D, Z
-  500      Lp, Rp



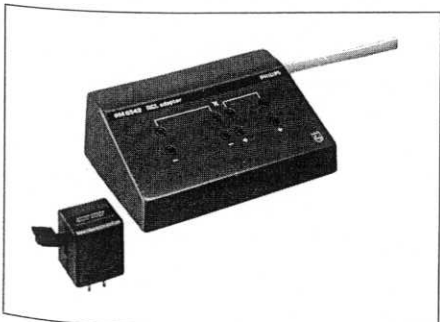
PM 6303 is extremely versatile making it a valuable measurement tool in industry, service workshop or education.

Performance Characteristics	PM 9541	PM 9542*
DUT-connection	by two Kelvin clips	by Kelvin contacts in the test pods
Short-circuit inductance	0.1 $\mu$ H typical 10.3 $\mu$ H max	<0.1 $\mu$ H max
Mechanical Specifications		
Cable length	600 mm	600 mm
Case dimension	—	50 x 145 x 95 mm
Weight	0.2 kg	0.6 kg

\* Alone or combined with 9542SMD



4-wire test cable PM 9541 (optional)



4-wire RCL adapter PM 9542 with SMD adapter PM 9542SMD (optional)

**Quality/Dissipation Factor:** 0.001  
**Measuring Accuracy:** Basic Error  $\pm 0.25\%$   $\pm 1$  digit  
**Measuring Frequency:** 1 kHz  $\pm 0.025\%$   
**DUT Stress:**  $\leq 5$  mA,  $\leq 2$ V, (linked to a 2V rms source with an internal resistance of 400 $\Omega$ )  
**Measurement Update Rate:** Approx 2 measurements per second  
**Zero Capacitance Adjustment:** Co-trim by means of screwdriver adjustment on front panel  
**Maximum Adjustable Capacitance:** 5 pF  
**Type of Connectors:** 4 mm sockets; 2 sockets for measuring voltage (HI); drive and sense connection; 2 sockets for measuring current (LO); drive and sense connection; 1 socket guard connection

**Power Requirements**  
**Voltage:** 110V, 128V, 220V, 238V  $\pm 10\%$   
**Frequency:** 50 Hz to 100 Hz  $\pm 5\%$   
**Power Consumption:** 13W

**Environmental Conditions**  
**Ambient Temperatures**  
**Reference Value:**  $+23^\circ\text{C} \pm 1^\circ\text{C}$

**Operation:**  $+5^\circ\text{C} + 40^\circ\text{C}$   
**Storage and Transport:**  $-40^\circ\text{C}$  to  $+70^\circ\text{C}$

**Mechanical Specifications**  
**Size:** 310 mm W x 140 mm H x 310 mm L (12.2 in W x 5.15 in H x 12.2 in L)  
**Weight:** 4.8 kg (10.6 lb)  
**Included with Instrument:** Two-terminal fixture/operating manual

**Ordering Information**

**Model**      January 1991 prices  
 PM 6303/008 Automatic RCL Meter ..... \$1450

**Accessories** (Also see Section 5)  
 PM 9541/00 Four-wire Test Cable ..... \$ 65  
 PM 9542 RCL Test Adapter ..... 255  
 PM 9542SMD SMD Adapter for PM 9542 95

*Note: The above configurations meet North American power requirements. For other power options, see Section 19.*