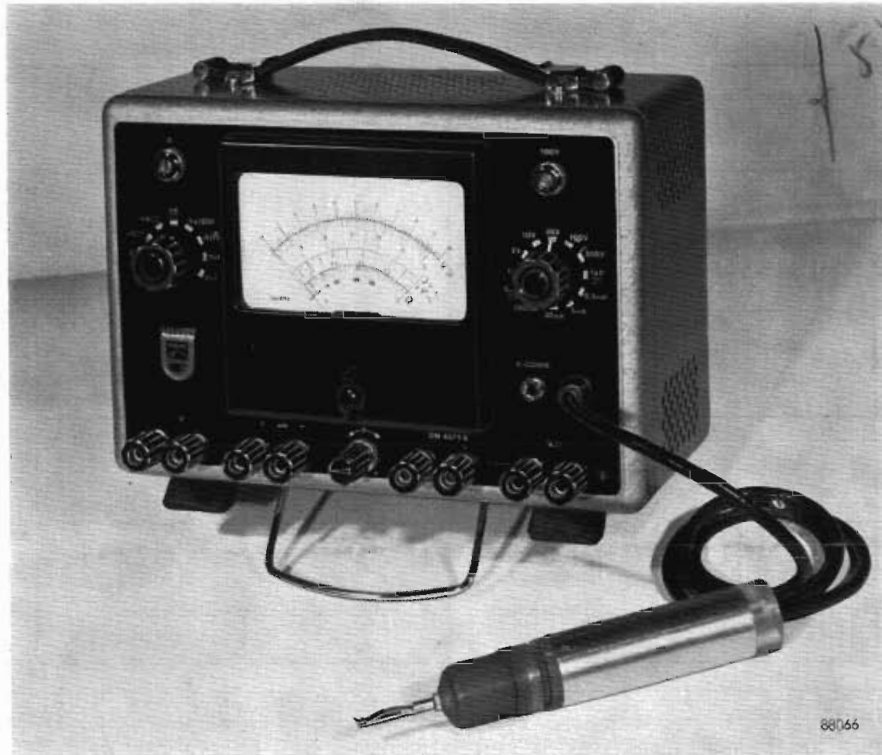


# PHILIPS

## MEASURING APPARATUS

### ELECTRONIC VOLT-OHM-mA-METER TYPE GM 6009



The GM 6009 succeeds the well-known GM 7635, which has proved to be of great practical value, particularly for radio and TV service. The apparatus has been completely modernised, both electri-

cally and mechanically. The excellent properties of the GM 7635 have been further improved, whilst moreover some new measuring possibilities are provided.

#### FEATURES

The following measurements can be made :

Direct voltages from 10 mV to 1000 V and, with the aid of the H.T. probe GM 4579 B, up to 30 kV.

Alternating voltages from 100 mV to 300 V in the frequency range 20 c/s - 100 Mc/s.

By means of an extra H.F. probe GM 6050 alter-

nating voltages up to approx. 900 Mc/s.

Direct currents from 10  $\mu$ A to 300 mA.

Resistances from 10  $\Omega$  to 10 M $\Omega$ .

By means of the voltage available from the front panel, which is also used as calibration voltage, resistances up to about 1000 M $\Omega$ .



### DESCRIPTION

The apparatus consists of an attenuator, a D.C. amplifier and a moving coil instrument. For measuring A.C. and H.F. voltages a diode is connected before the attenuator.

The measuring instrument is connected between the anodes of the double-triode, one half of which is used as amplifier whilst the other half serves for compensation. The attenuator is built up of very stable high-precision resistors, so that calibration of one measuring range ensures the guaranteed accuracy of all other measuring ranges. For the

alternating voltage ranges variable resistors are incorporated in series with the measuring instrument, which makes it possible that also the two lowest ranges, which, due to the series diode, follow a square-law pattern, can be extended along the whole scale.

Direct currents are directly measured with the moving coil instrument; the various ranges are switched on by means of shunts. For resistance measurements the amplifier is not used either.

### TECHNICAL DATA

Quantity measured	Measuring range (total)	Subdivided into ranges	Input	Measuring error	Remarks
Direct voltages	10 mV - 1000 V 1 - 30 kV	300 mV; 1; 3; 10; 1000V; 3; 10; 30 kV	3 MΩ 10 MΩ 900 MΩ	3 % 3 % 20 %	with GM 4579
Alternating voltages	100 mV - 300 V	1; 3; 10; 300 V	3 MΩ + ca. 7 pF	3 %	calibrated in r.m.s. values
Direct currents	10 μA - 300 mA	0.3; 3; 30; 300 mA	voltage drop max. 0.3 V		
Resistances	10 Ω - 10 MΩ	0.2; 2; 20; 200 kΩ centre-scale value		5 %	measuring error at centre-scale

#### Frequency-response curve

The frequency range of the measuring instrument extends from 20 c/s to 100 Mc/s, with a maximum deviation of 2 % in the range 100 c/s to 90 Mc/s. At 20 c/s the max. deviation is less than 3% with respect to 100 c/s, and at 100 Mc/s less than 10 % with respect to 90 Mc/s. By using the probe GM 6050 the frequency range can be extended up to 900 Mc/s.

#### Input impedance

In all positions of the attenuator the input capacitance is approx. 7 pF. The input impedance for alternating voltages is 3 MΩ for the lower frequencies; due to dielectrical losses the damping increases at higher frequencies.

#### Calibration voltage

The error of calibration voltages is less than 1 %.

#### Dependence of mains voltage

Mains-voltage fluctuations of ± 5 % cause a drift of the zero point of max. 2 % and a drift of the sensitivity of max. 1%, so that the error after renewed zero setting cannot amount to more than 1 %.

#### Zero setting

Zero correction is carried out with a fine-adjusting knob on the front panel and a rough screwdriver adjustment at the rear of the apparatus. This rough adjustment is only used after an amplifying tube has been replaced or for the purpose of placing the pointer in the centre of the scale, e.g. for measuring discriminator curves. There will be hardly any deviation from the zero point when the apparatus is switched over from alternating-voltage to direct-voltage ranges or switched over from one voltage range to another.



### Moving coil instrument

The incorporated moving-coil instrument of 100  $\mu$ A, 3000 $\Omega$  is protected against overloads.

### Supply

The apparatus is entirely mains-fed and can be adapted to 110, 125, 145, 200, 220, and 245 V; 40 - 100 c/s. The power consumption amounts to about 30 W.

### Tube complement

1 x E 80 CC amplifying tube (for professional use)

1 x EAA 91 double-triode

1 x EZ 80 full-wave rectifying tube

1 x 6864 T dial lamp

### Dimensions and weight

Height 25 cm

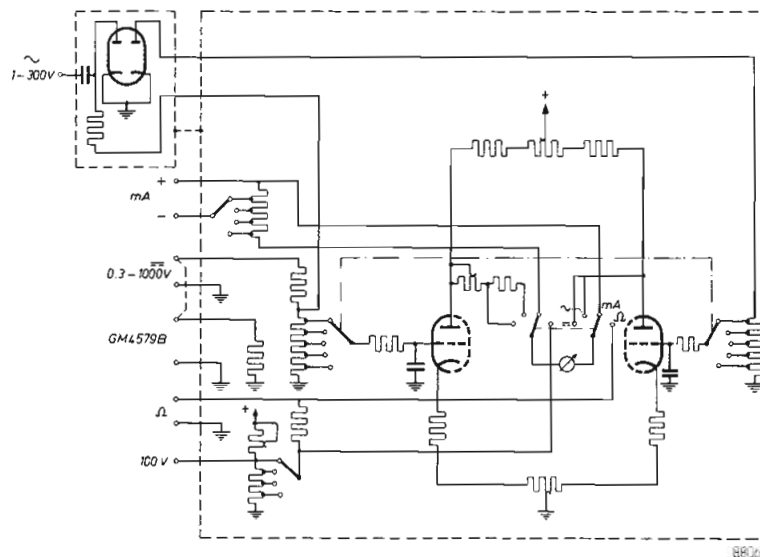
Width 20 cm

Depth 17 cm

Weight 5.2 kg

### Finish

The apparatus is enclosed in a grey enamelled metal case with leather handgrip.



Simplified circuit diagram of the GM 6009

*Every PHILIPS apparatus is supplied together with full directions for use.*

*We reserve the right to make any modifications to the products to be supplied that we may consider to be necessary, without giving previous notice.*



