

PHILIPS

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**VHF Millivoltmeter  
Type GM 6025**



**Features**

- Very large frequency range
- High sensitivity
- Great accuracy
- Linear scale of 12.5 cm effective length
- Only two scales for all measuring ranges
- High input impedance
- Built-in calibration voltages
- For measurements on 50  $\Omega$  coaxial cables use can be made of the T-piece GM 6050 T.

Industrial equipment division  
Electronic measuring apparatus  
VHF millivoltmeter  
Type GM 6025



### Application

The GM 6025 is indispensable in those fields of electronics where low voltages have to be measured quickly and accurately over a very large frequency range, e.g. UHF-TV bands, tunnel diodes etc.

### Description

The voltage to be measured is rectified by the measuring crystal in the probe. This direct voltage is then measured by means of a stable and sensitive d.c. microvoltmeter. The deflection of the pointer is an indication of the voltage measured. The scale is calibrated in the r.m.s. value of a sinusoidal VHF voltage.

Owing to the diode characteristic, the scale would not be linear if no special precautions were taken. Each measuring range would then require a separate scale, which might cause confusion. Also, changing a measuring diode would mean changing the scale.

With the GM 6025 these drawbacks are eliminated by including a voltage-dependent feedback circuit in the amplifier. The voltage dependency is obtained by using a diode in the feedback circuit. The two diode characteristics (measuring diode and feedback diode) fully compensate each other. As a result the GM 6025 has only 2 linear voltage scales (0—100 and 0—300), so that the measuring diodes can be changed without replacing the scale. This may be necessary if a VHF voltage  $>15$  V is erroneously applied to the measuring diode. Replacement of the measuring diodes and recalibration is then quite simple. Other auxiliary equipment is not required, as a generator which supplies the necessary calibration voltages is incorporated.

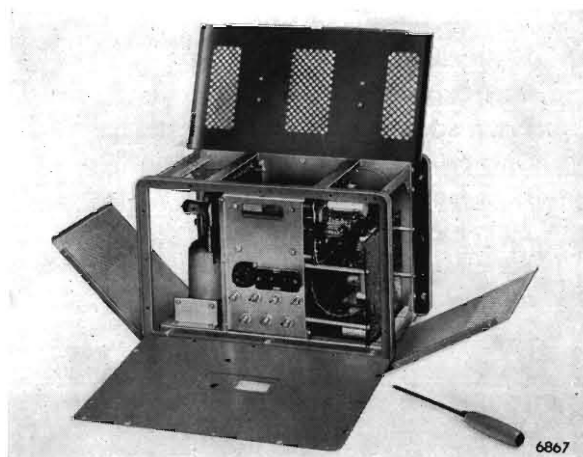
There are 7 calibration voltages, one for each measuring range. As all of these voltages are alternately available at one output socket (according to the position of the measuring-range switch) the appropriate calibration voltage is automatically selected. Recalibration can thus be carried out quickly and errors cannot be made.

The measuring diode being a germanium diode has a PN potential, due to which the meter would have

a certain predeflection. To prevent this the GM 6025 possesses an adjustable compensating voltage, which eliminates the diode potential and thus guarantees an effective zero adjustment. As a result, a greater degree of accuracy is obtained for very sensitive measurements.

For measurements on  $50 \Omega$  coaxial cables a T-piece GM 6050 T is available.

The construction of the GM 6025 is such that each side-cover can be removed separately (see photograph). This results in extreme ease of access, making maintenance very easy.



### Technical data

#### MEASURING RANGE

##### Voltage range

10 mV (full scale deflection) —10 V  
7 ranges: 10 mV - 30 mV - 100 mV - 300 mV -  
1 V - 3 V - 10 V

##### dB scale

from —50 dB to +22 dB (0 dB = 0.775 V)

##### Maximum permissible voltage

VHF voltage: 15 V  
direct voltage: 350 V

##### Total measuring error

With the T-piece for all measuring ranges  
from 1 Mc/s - 300 Mc/s: < 5 %  
from 0.1 Mc/s - 1 Mc/s: < 15 %  
from 300 Mc/s - 800 Mc/s: < 15 %

This includes the maximum error of the calibration voltages.

##### Pre-deflection

< 1 mV

#### FREQUENCY RANGE

If the earthing is good, voltages with frequencies up to 250 Mc/s can be measured by means of the probe. The GM 6025 with the T-piece can be employed as a voltage indicator for frequencies in excess of 4,000 Mc/s.

##### Response (with the T-piece)

from 1 Mc/s to 300 Mc/s:  
flat to within 1,5 % (—0.2 dB)  
at 0.1 Mc/s: —10 % (—0.9 dB)  
at 800 Mc/s: +10 % (+0.8 dB)

#### INPUT IMPEDANCE

##### Input capacitance

1 pF

##### Input damping

at 1 Mc/s - 65 k $\Omega$   
at 10 Mc/s - 60 k $\Omega$   
at 100 Mc/s - 50 k $\Omega$   
at 200 Mc/s - 35 k $\Omega$

#### CALIBRATION VOLTAGES

7 calibration voltages giving a f.s.d. on each measuring range

#### SUPPLY

110 - 125 - 145 - 200 - 220 - 245 V (40—100 c/s)  
A 5 % mains voltage variation results in a deviation of not more than 0.5 % after recalibration

##### Power consumption

36 W

#### TUBE COMPLEMENT

E80F (2  $\times$ ); EF86 (3  $\times$ ); PCL82; EZ80; 85A2 (2  $\times$ ); E88CC; OA202 (7  $\times$ ); EAA91 (2  $\times$ )

#### DIMENSIONS AND WEIGHT

Height: 24 cm (10")  
Width: 36 cm (14")  
Depth: 22 cm (9")  
Weight: 11 kg (24 lbs)

### Coaxial T-piece GM 6050 T



#### Technical data

##### Frequency range

0.1 ... 1000 Mc/s

##### Characteristic impedance

50  $\Omega$

##### V.S.W.R.

< 1.1 for frequencies up to 800 Mc/s  
< 1.2 for frequencies up to 1000 Mc/s