

INTRODUCTION

The PMG-3 allows you to perform fast, simple measurements. The PMG-3, which is compact and portable, has a generator section and a receive section so that the most important standard parameters can be measured in the exchange or in the field. From 50 Hz to 20 (110) kHz it is possible to measure the gain and attenuation of telephone and data links, to carry out frequency response measurements and to measure noise-to-ground, and weighted noise. As the weighted noise measurement facilities comply with CCITT Rec. P.53 and CCIR Rec. 468-2, there are no compatibility problems when the PMG-3 is used with test equipment and test systems from other manufacturers. The VF-1 is a special version of the PMG-3 for the North American market and conforms to Bell System Publication 41009.

A special feature of the PMG-3 is the synthesiser used in the generator section. It is possible to continuously tune the frequency between 50 Hz and 20 (110) kHz with a resolution of 1 Hz. The set value is very stable. The output level is also very stable so the PMG-3 is able to provide a very accurate test signal. The PMG-3 has three fixed frequencies (420, 820, 3000 Hz) that are selected by means of three buttons. This means that the frequency you want can be quickly selected during frequency response measurements.

The transmission level can be varied between -50 dBm and +10 dBm; the resolution is 0.1 dB. The test output, a 3-pole CF connector, is balanced. Two output impedances, 600 Ω and 1200 Ω , are available.

The receive section of the PMG-3 can be used to perform a large variety of measurements. The test port is balanced. There are three input impedances, 600 Ω , 1200 Ω and high impedance. This means that the test set is compatible with voice- and sound-programme channel systems.

An rms detector is used for level and noise measurements from (20) 50 Hz to 110 kHz. Measurements on sound programme channels are carried out using a quasi-peak value detector to CCIR 468-2. The dynamic requirements stated in CCIR 468-2, 2.2 are also fulfilled by the digital level meter. The appropriate weighting filter is selected by means of a button on the front panel. The level range is selected automatically.

A digital display shows the measured level in dBm; the resolution 0.1 dB. A second digital display shows the measured frequency of the test signal; the resolution is 1 Hz or 10 Hz.

A notch filter can be connected in series with the weighting filters to carry out quantising noise measurements on PCM systems. The notch filter removes the 820 Hz activation signal.

Weighted or unweighted noise measurements can then be made with the other filters.

A dialling unit can be connected as a test aid for performing measurements on 2-wire lines. The connectors for the unit are on the front panel.

Two 3-pole CF connectors are arranged so that the test output and the test input can be exchanged by pressing a button. This means that it is possible to switch from transmit to receive mode when 2-wire measurements are being performed without having to reconnect test cables.

The SZU-969 Speech Attachment and 2-wire Switchover, an option, is ideal for setting up telephone connections of this kind. The SZU-969 is battery powered and has a microphone, loud-speaker, a dialling pad and a 2-wire patching panel.

The PMG-3 is normally mains-powered, but a rechargeable battery pack is available as an option. The battery pack can be charged overnight. A carrying case, which is also available as an option, is ideal for protecting and storing the instrument.

1 SPECIFICATIONS

Unless otherwise stated, the data and the error limits quoted apply immediately after switch-on to any operating conditions or settings within the nominal ranges of use stated in section 1.3.

1.1 GENERATOR SECTION

1.1.1 GENERATOR FREQUENCY

FREQUENCY SETTING	
Quasi-continuous with rotary knob	50 Hz to 20 kHz
Fixed frequencies (selected with buttons)	420, 820, 3000 Hz
Frequency display	5-digit LCD
Max. frequency resolution	1 Hz
Generator frequency error limits	± 1 Hz

1.1.2 TRANSMISSION LEVEL

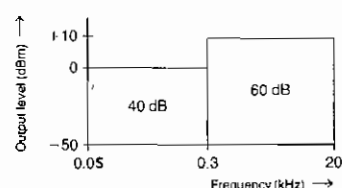
RMS, 3-digit LCD display resolution	0.1 dB
LEVEL SETTING	
Quasi-continuous in one range, coarse/fine setting	
LEVEL RANGE	-50 dBm to +10 dBm
ERROR LIMITS OF THE TRANSMISSION LEVEL	
at $Z_{out} = Z_L = Z_o$	
in the frequency range 200 Hz to 20 kHz	± 0.2 dB
50 Hz to 20 kHz	± 0.5 dB
ERROR LIMITS OF THE FREQUENCY RESPONSE	
referred to 820 Hz, in the frequency range 200 Hz to 20 kHz	± 0.2 dB
50 Hz to 20 kHz	± 0.5 dB

1.1.3 GENERATOR OUTPUT

Balanced, floating	3-pole, CF-connector
Output impedance, switchable	600 Ω , 1200 Ω

1.1.4 SPECTRAL PURITY OF THE OUTPUT VOLTAGE

HARMONIC RATIO a_{k2}, a_{k3} ,
 $Z_{out} = Z_L = Z_o$



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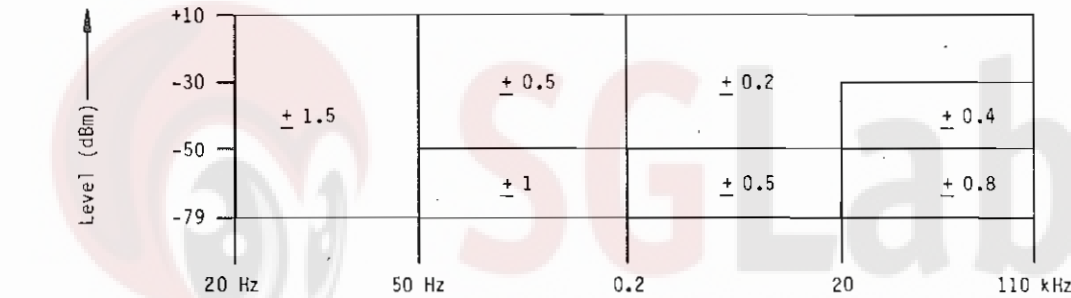
1.2 RECEIVE SECTION

Suitable for level, noise and frequency measurements
 Detector, switchable rms, quasi-peak

1.2.1 LEVEL MEASUREMENTS

Wideband level measurements. The receive signals are passed through an rms detector.
 Power level display, autoranging facility.
 Frequency range 20 Hz to 110 kHz
 Receive-level range -79 dBm to +10 dBm
 Level display 3-digit LCD display with sign
 Resolution 0.1 dB

1.2.2 LEVEL DISPLAY ERROR LIMITS



1.2.3 NOISE MEASUREMENTS

1.2.3.1 Weighted noise measurements

Level range -89 dBm to +9.9 dBm
 Display resolution 0.1 dB
 Frequency range 20 Hz to 35 kHz
 Weighting filters
 Voice channel to CCITT P.53
 Sound programme channel to CCIR 468-2
 Filters switchable to telephone, weighted/flat
 sound programme, weighted/flat

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1.2.5 TEST INPUT

Balanced, floating 3-pole CF connector
 Input impedance, switchable 600 Ω , 1200 Ω or bridging
 Signal balance ratio, at 50 Hz ≥ 80 dB
 Tapping loss, high impedance termination
 $Z_o = 600 \Omega$ ≤ 0.15 dB
 $Z_o = 1200 \Omega$ ≤ 0.3 dB

Return loss

$Z_o = 600 \Omega$	24 dB	32 dB	40 dB	32 dB
$Z_o = 1200 \Omega$	18 dB	26 dB	40 dB	26 dB
	50 Hz	0.2 kHz	0.6	20
				110

1.2.6 OC LOOP-HOLDING CIRCUIT

Voltage-drop across the holding circuit at	600 Ω	1200 Ω
Holding current $I = 20$ mA	approx. 9 V	approx. 9 V
$I = 50$ mA	17 V	34 V
$I = 80$ mA	35 V	(max. 40 V, $I = 55$ mA)

1.3 ADDITIONAL INFORMATION

Power supply and ambient conditions

1.3.1 POWER SUPPLY

1.3.1.1 Mains operation

Mains voltage 120 V, 220 V $\pm 10\%$
 Mains frequency 45 to 66 Hz
 Power consumption mains operation approx. 15 VA
 IEC 348 and VDE 0411 safety classification Class I

1.3.1.2 Battery operation

Rechargeable batteries as option
 Operating time for fully charged battery, at 25°C approx. 5 h
 Charging time, using built-in charger approx. 16 h
 Battery life at least 500 charges

1.3.2 OPERATING ENVIRONMENT

Ambient temperature
 Nominal range of use 0 to +55°C
 Storage and transportation -40 to +60°C
 No condensation must be allowed to form.

1.3.3 DIMENSIONS, WEIGHT

Dimensions (w x h x d) in mm 222 x 155 x 414
Weight without batteries approx. 8 kg

1.4 ORDERING INFORMATION

Transmission Measuring Set PMG-3, CCITT-Version (without batteries)	BN 9202/03
Transmission Measuring Set VF-1 U.S. version (without batteries)	BN 9201/01
<u>Option</u> (charged extra) Set of batteries	BN 9202/00.01
<u>Accessories</u> (charged extra) Speech Attachment and 2-Wire Switch over SZU-969 ¹⁾	BN 969/01
Protective Transportation Covers SD-35 (1 set)	BN 900/00.23
Carrying Case AT-052 S	BN 9000/01
19" Conversion Kit	BN 9000/00.02

1) See specification sheet for more information.

