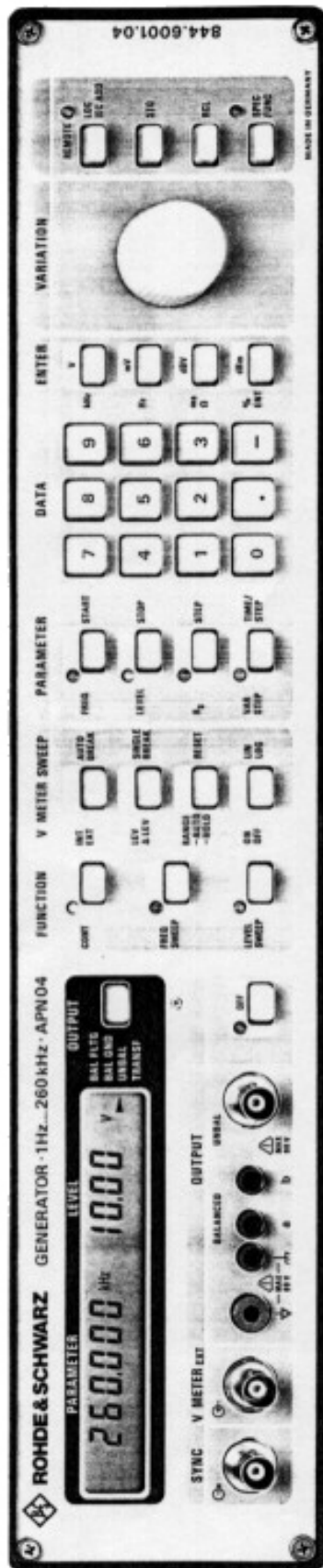


APN 02
APN 04
APN 06



AF Generator

APN

1 Hz to 260 kHz

- Synthesizer
- 50 μ V to 20 V – balanced and unbalanced
- Source impedance settable to values between 10 Ω and 640 Ω

AF Test Set

APN

with integral voltmeter
50 μ V to 50 V

- Floating
- True rms at
 - generator output
 - test input

IEC 625 Bus IEEE 488


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APPLICATIONS

Range of applications

Advantages of the APN

Routine lab and service dept measurements

high output voltage, flat frequency response, frequency and level sweep, synthesizer accuracy, integral voltmeter

Ultrasound measurements

synthesizer accuracy, external synchronization possible, high output level

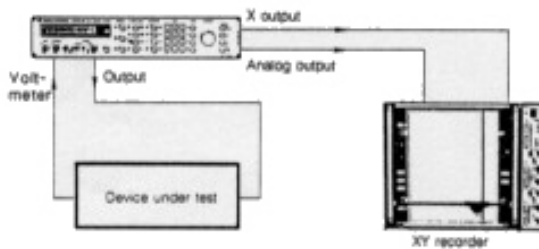
Radiotelephone measurements (test systems, multi-tone modulation, selective-call tone sequences, SSB)

high frequency resolution, no phase hits when frequency changed, synthesizer accuracy, integral voltmeter

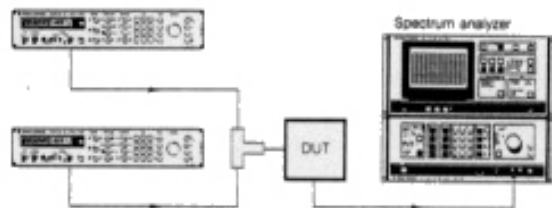
Automation and control

frequency and level sweep, floating output, high voltage, square signal with adjustable level

Transmission measurements



Distortion measurements



Telemetry

fast frequency selection with no settling time

AF transmission systems (telephone)

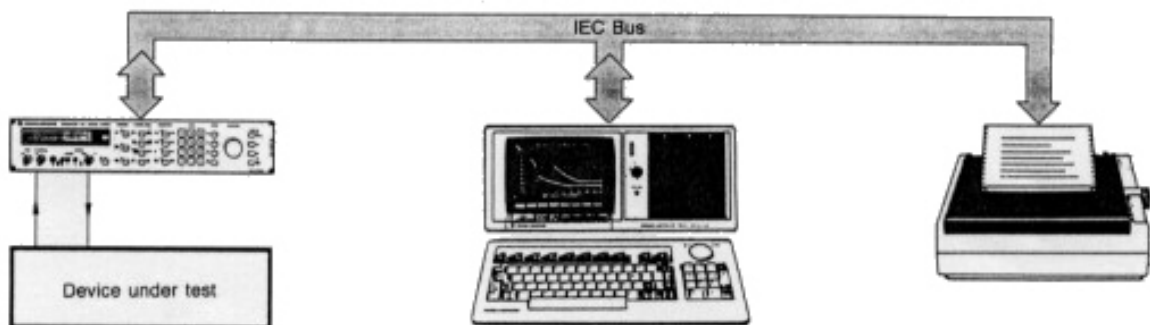
selectable source impedance floating and balanced output configurations

Acoustics (loudspeakers, microphones)

low distortion, selectable source resistance, floating and balanced output configurations, frequency sweep

Determining the load impedance

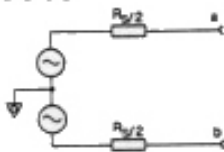
selectable source impedance, simultaneous display of load voltage and EMF ($V_{load} = 1/2 EMF$ if $R_{source} = R_{load}$)



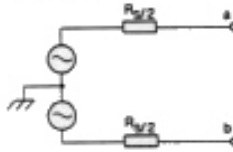
Computer-controlled test setup for transmission measurements

SPECIFICATIONS

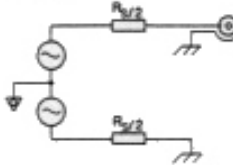
BAL FLTG



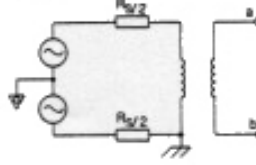
BAL GND



UNBAL



TRANSF



Frequency	1 Hz to 260 kHz
Range	1 Hz, 0.1 Hz at f < 20 kHz
Resolution	
Switching time (after reception of last character via IEC bus)	15 ms
Frequency error (after 10 min warmup time)	$< 4 \times 10^{-8} + \text{aging error}$
Aging	$< 10^{-5}/\text{year}$
Signal output	entry via keypad
Impedance	(nominal values > 640 Ω to customer specifications)
Balanced, floating	10 to 640 Ω in 5- Ω steps
Balanced, grounded	2 x (5 to 320 Ω) in 2.5- Ω steps
Unbalanced	10 to 640 Ω in 5- Ω steps
Impedance error	$\pm 2 \Omega$
Level	V, μV , dBm
Balanced, floating	100 μV to 20 V EMF, $I_{\text{max}} = 200 \text{ mA}$ (10 V into 50 Ω)
Balanced, grounded	2 x (50 μV to 10 V) EMF, $I_{\text{max}} = 200 \text{ mA}$ (2 x 5 V into 25 Ω)
Unbalanced	100 μV to 20 V EMF, $I_{\text{max}} = 200 \text{ mA}$ (10 V into 50 Ω)
Level resolution	at least 10 μV or 0.1 dB
Total level error ¹⁾	$< \pm 0.5 \text{ dB}$
Frequency response	$< 0.5 \text{ dB}$
Attenuator error	$< 0.3 \text{ dB}$
Level setting time (after reception of last character via IEC bus)	15 ms
Connectors	
Balanced	3-contact female, DIN 41628
Unbalanced	BNC
Spectral purity	
THD ²⁾	
10 Hz to 100 kHz	$< -80 \text{ dBc}$ ($< 0.1 \%$ typ. -70 dBc)
Sum 2nd to 9th harmonic 10 Hz to 20 kHz	-80 dBc typ.
Harmonics and nonharmonic ³⁾	
100 to 260 kHz	$< -46 \text{ dBc}$ ($< -55 \text{ dBc}$ typ.)
SYNC output	same as signal output
Frequency	
Duty cycle	2
Level	TTL/HCMOS
Impedance	50 Ω
Sweep, frequency	
Digital start-stop sweep	
Operating modes	automatic after sawtooth or triangular signal, single shot, manual with knob, lin or log
Sweep range	any value from 1 Hz to 260 kHz
Stepwidth	any value $\geq 1 \text{ Hz}$ (lin) or 1% (log)
Step time	any value between 1 ms and 65 μs
Output voltage proportional to frequency	0 to 5 V (option APN-B1)
Sweep, level	
Digital start-stop sweep	
Operating modes	as above
Sweep range	any value $\geq 20 \text{ dB}$
Stepwidth	any value above $\geq 10 \mu\text{V}$ (lin) or 0.1 dB (log)
Step time	any value between 2 ms and 65 μs
Output voltage proportional to level	0 to 5 V (option APN-B1)
APN models	
Model 02	Generator 1 Hz to 260 kHz
Model 04	Generator 1 Hz to 260 kHz; with voltmeter and IEC connector
Voltmeter	
Function (true RMS)	digital display, INT/EXT selectable, voltage difference measurements in V or dB, trend display
Measurement range (V _{RMS})	50 μV to 50 V
Display	3 1/2 digits
Resolution	10 μV
Measurement error ¹⁾ (crest factor < 3)	$< \pm 0.5 \text{ dB}$ (5 Hz to 200 kHz) $< \pm 1 \text{ dB}$ (5 Hz to 260 kHz) $> 100 \text{ kHz}$
Input impedance	0 to 10 V, proportional to measured value
Analog output	

Model 06	Generator 1 Hz to 260 kHz; sine and square signal with adjustable level; IEC-bus connector
Square signal	0 to 10 V into 100 Ω
Rise/fall time	$< 10 \text{ ns}$
Over/undershoot	$< 5 \%$
T _{tr} ($f > 500 \text{ Hz}$)	$< 5 \%$
Remote control	provided for models 04 and 06
System	IEC 625-1 (IEEE 488)
Connector	24-contact, Amphenol
Remote-controllable functions	all front-panel functions that can be set manually, except power ON/OFF and variation
IEC-bus address	set via keypad, 00 to 30
Interface functions	listener and talker SH1, AH1, T5, L4, SR1, RL1, PP0, DC1, DT0, C0
Option APN-B1: reference-frequency input/output and output voltage proportional to level or frequency	
Input/output frequency	5 or 10 MHz, selectable
Output level	$> 0.2 \text{ V}$ into 50 Ω
Input level	0.2 to 2 V into 50 Ω or TTL/HCMOS
X-output	
1 Hz	0 V
260 kHz	5 V
For sweep (frequency and level)	
Start	0 V
Stop	5 V

Extra specifications

SINAD (signal to noise and distortion), typical measured values at $f = 1 \text{ kHz}$ and $R_{\text{source}} = R_{\text{load}} = 600 \Omega$, signal level 1 V and 100 μV , balanced and unbalanced

	1 V	100 μV
Bandwidth 22 Hz to 22 kHz	80 dB	40 dB
Weighted to CCITT	84 dB	50 dB
Weighted to CCIR	70 dB	32 dB

General data

Rated temperature range	0 to +55 °C
Storage temperature range	-40 to +70 °C
Power supply	100/120/220/240 V $\pm 10 \%$ 47 to 440 Hz, safety class I to VDE 0411 (IEC 348) shock-tested to DIN 40046, part 7 (30 g, 11 ms) and vibration tested to DIN 40046, part 8 (5 to 55 Hz, 2g); corresponds to IEEE 98-2-27 and 98-2-5
Mechanical resistance	
Dimensions (B x H x G), weight	435 mm x 103 mm x 350 mm, 7.5 kg

Ordering information

Order designation	► Generator APN
APN 02	844.6001.02
APN 04	844.6001.04
APN 06	844.6001.06
Supplied accessories	power cable, manual
Option	
Reference-frequency input/output and output voltage proportional to frequency or level	844.8340.02
Recommended extras	
19" Adapter	ZZA-92 396.4866.00
Set of Front-panel Handles	ZZG-92 396.5147.00
Feed-through Termination 50 Ω	RAD 50 844.9362.02
Feed-through Termination 100 Ω	RAD 100 844.9400.02
Feed-through Termination 600 Ω	RAD 600 844.9452.02
Two-core cable, shielded, balanced, with 3-contact connector and 3 banana plugs	APN-Z1 864.9652.00
Service Kit with test connector for unbalance measurements and a floppy disk for checking the instrument	APN-Z5 844.9898.00

¹⁾ Level > 10 mV (EMF), frequency > 5 Hz
²⁾ Level > 100 mV (EMF)



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Model 62 model APN 62 is a modified version of the APN 06. It contains an output transformer and has different AC supply voltage ranges

Transformer

Frequency range	20 Hz to 25 kHz
Impedance	2 kΩ
Level range	100 μV to 30 V into 2 kΩ
Level resolution	min. 10 μV or 0.1 dB
Total level error ¹⁾	< ±1.0 dB
Frequency response	< 1.2 dB
Attenuator error	< 0.6 dB
Connector	3-contact female, balanced, DIN 41628

General specifications

Power supply	94 to 127 V, 188 to 265 V 45 to 440 Hz
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All other specifications are the same as those of the APN 06 ²⁾

Order designation ► Generator APN 62
844.6001.62

Recommended extra:
Accessory Case ZZT-97 396.9936.00

¹⁾Level > 10 mV (EMF), frequency > 20 Hz

²⁾ With the exception of SINAD-Extra specifications at the condition: level 100 μV/unbalanced

