SPN

Generator SPN 1 Hz to1.3 MHz

- Compact, economy-priced generator with wide frequency range
- High frequency accuracy (synthesizer)
- Wide output-voltage range, outputs for sinewave and squarewave signals
- Low distortion
- Switch-selected output impedance: 600/50/≈5 Ω
- IEC/IEEE-bus-compatible, swept-frequency operation (lin/log) possible
- Maximum stability with external reference frequency (1 MHz)

IEC 625 Bus

An optimum combination of time-proven BCD and modern synthesizer techniques, the Generator SPN offers a combination of high frequency stability, extremely low distortion, high spectral purity and flat frequency response of the output signal.

Applications

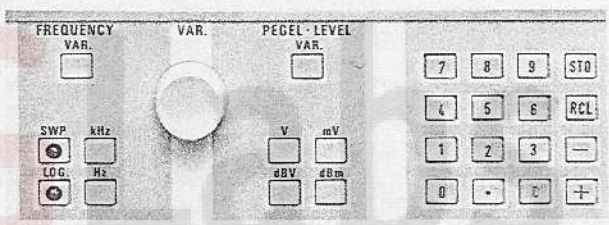
The Generator SPN can be operated manually as well as via the IEC/IEEE bus so that it finds widespread use in many fields such as

hifi technology, acoustics
development and production
research and training
servicing

There is also a large number of other fields where accurate frequencies are required, for instance in telemetry and physics or in mechanical control processes. In addition, the outputs of two SPN generators can be connected in parallel for measuring non-linear distortions.

Characteristics

Ease of operation The built-in microprocessor makes the generator an intelligent unit which is easy to operate and to program. Manual settings are made by pressing the keys first for the numerical value and then for the unit. Quasi-continuous settings are possible with the rotary knob.



Keyboard of SPN affording great ease of operation

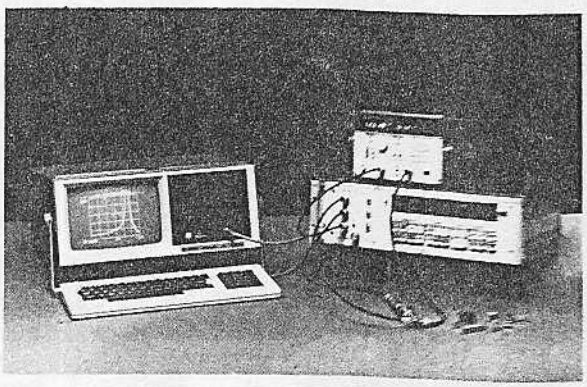
Storage capability The SPN is able to store five complete setups (memory addresses: 1 to 5). The RCL key permits both complete setups and individual frequency or level settings to be recalled.

Frequency State-of-the-art synthesizer technology ensures crystal-referenced output frequencies from 1 Hz to 1.3 MHz with a frequency setting time of only 50 ms. The short setting time is important in computer-controlled test systems with a high measuring rate or for the generation of tone sequences such as those required for measurements on selective calling equipment. The frequency entered via the keyboard is read out on the display in five digits (smallest resolution: 0.1 Hz) with a floating decimal point. The frequency can be varied quasi-continuously using a rotary knob. The SPN offers another convenient way of frequency variation by frequency jumps with selectable step size and by calling up the standard octave and third-octave sequences. Logarithmic frequency variation is possible by entering a multiplication or division factor between 1.00 and 2.00.

Output level (sinewave output) Adjustable between 0.1 mV and 10 V with smallest resolution of 0.01 mV (depending on output impedance selected). The output level is read out in three digits with a floating decimal point on the level display (in V, mV, dBV or dBm). The output level entered can also be varied quasi-continuously or in steps and it can be converted from one unit into another simply at the push of a button. The maximum output EMF is 10 V_{rms}.

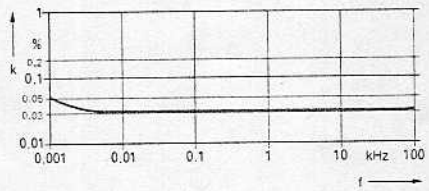
Distortion is as low as 0.03% in the frequency range from 50 Hz to 100 kHz, so that the SPN fulfils the most demanding requirements of the audio-frequency range.

Test assembly using SPN for computer-controlled measurement of components



Output level on/off The level is switched off by pressing the illuminated R_i key and switched on by pressing one of the dark R_i keys.

Guaranteed distortion limits for maximum output EMF of 10 V_{rms} (k=distortion)



Output impedance The impedance of the sinewave output can be selected between 600, 50 and approximately 5 Ω at the push of a button and thus be matched to the standard system impedances. Modification to other output impedances is possible upon customer's request. The output impedance is linear and real, allowing the sinewave outputs of two SPN generators to be connected in parallel.

Squarewave output In addition to the sinewave output, an output with a squarewave signal of the same frequency is available for driving digital circuits as well as for other measuring tasks.

External sweeping The generator frequency can be swept in linear or logarithmic mode over the entire frequency range or certain subranges – required sweep voltage 0 to 2 V. The logarithmic conversion is done internally. The sweep range extends from 1 Hz to the upper range limit which can be selected and is indicated on the display.

Range 1 1 Hz to 2.000 kHz 3 1 Hz to 130.00 kHz
2 1 Hz to 20.00 kHz 4 1 Hz to 1300.0 kHz

Remote control All settings of the Generator SPN can be made remotely. The short programming time makes the SPN suitable for use in automatic measuring assemblies and test systems.

SPN-Z1

Balun (option) Used for feeding balanced line systems or amplifiers and for eliminating hum pickup in test setups. Stepdown transformation, so low internal impedance (≈15 Ω).

Specifications

Frequency range	1 Hz to 1.3 MHz
Frequency setting	entry via keyboard or rotary knob in Hz or kHz
Display	5-digit readout
Resolution	
bei 1 Hz to 2 kHz	0.1 Hz
2 to 20 kHz	1 Hz
20 to 130 kHz	10 Hz
130 to 1300 kHz	100 Hz
with special function RCL 05	
1 Hz to 20 kHz	1 Hz
Frequency switching time	50 ms
Crystal aging	$<1\times10^{-5}$/month
Temperature effect	$\leq1\times10^{-6}$/°C
Reference frequency connection	1 MHz (int./ext., common connector)
Output	TTL levels
Input	0.2 to 2 V_{rms} into 500 Ω or TTL levels
Levels	
Sinewave output (short-circuit-proof)	
Output EMF in V_{rms}	1 mV to 10 V (Z_{out} = 600 and 50 Ω) 0.1 mV to 1 V (Z_{out} ≈ 5 Ω)
Level setting	keyboard entry or rotary knob
Indication	3-digit readout of EMF in V, mV, dBV and of power in dBm with matching
Resolution	
0.1 to 0.99 mV	0.01 mV
1 to 99.9 mV	0.1 mV
100 to 999 mV	1 mV
1 to 10 V	0.01 V
for dBV and dBm	0.1 dB
Error of output EMF	
300 mV to 10 V	<2%
10 to 300 mV	<3%
1 to 10 mV	<5%
Frequency response flatness of output EMF	
10 Hz to 9.999 kHz	<1%
10 kHz to 1.3 MHz	<1%
10 Hz to 1.3 MHz	<2%
Output impedance, switch-selected	600/50 Ω ±1% approx. 5 Ω
Switching off level	by pressing R_i keys
Level switching time	<30 ms
Connector	BNC female
Squarewave output	TTL levels, positive
Connector	BNC female
Spectral purity	
Total distortion at 10 V EMF (Z_{out} = 600 Ω and 50 Ω	
1 to 50 Hz	<0.05%
50 Hz to 100 kHz	<0.03%
Harmonics	
$f_{carrier}$ ≤100 kHz	<−70 dBc
$f_{carrier}$ >100 kHz	<−54 dBc
Non-harmonics (V_{out} >100 mV)	
$f_{carrier}$ ≤700 kHz	<−70 dBc
$f_{carrier}$ >700 kHz	<−65 dBc
AC supply- and microphony-dependent spurious signals	
$f_{carrier}$ ≤130 kHz	<−65 dBc
$f_{carrier}$ >130 kHz	<−50 dBc
Sweep operation	with external signal; linear or logarithmic scale, switch-selected
Sweep range from 1 Hz to	2 kHz/20 kHz/130 kHz/1.3 MHz
Sweep voltage	0 to 2 (1.3) V/10 kΩ
Sweep frequency	0 to 10 kHz
Local/remote control	
Frequency-proportional output voltage	0 to 2 (1.3) V/200 Ω, BNC female connector
Remote control	
System	IEC 625-1/IEEE 488
Functions	L4, T6, RL1, DC1, SR1
Connector	24-contact female (Amphenol)

General data

Rated temperature range	+5 to +45 °C
Storage temperature range	−40 to +70 °C
RF leakage	full compliance with VDE 0871 and MIL-STD-461A, methods CE 03 and RE 02 (radiated and conducted interference) and VDE 0875 (limit values of radio interference grade K)
Mechanical resistance	shock- and vibration-tested to DIN 40046, parts 7 and 8 (corresponding to IEC Publications 68-2-27 and 86-2-6)
AC supply	100/120/220/240 V ±10%, 47 to 63 Hz (80 VA), safety class I to VDE 0411
Dimensions, weight	245 mm×154 mm×347 mm, 6.5 kg

Ordering information

Order designation	▶ Generator SPN 336.3019.02
Accessories supplied	power cable
Recommended extras	
Balun SPN-Z1	265.4319.02
19" Adapter ZZA-13	079.0702.00

Specifications of Balun SPN-Z1

Input connector	BNC male with coaxial cable
Output connector	4 mm knurled terminal
Frequency range	30 Hz to 100 kHz
Open-circuit turns ratio	3,16:1 ≙ −10 dB (±0.1 dB)
Impedance	≈15 Ω
Permissible load impedance	≥150 Ω up to open circuit
Distortion	<0,2% (for source voltage 10 $V_{rms\ max}$ and Z_{out} = 50 Ω)
Dimensions, weight	83 mm×130 mm×105 mm, 1.5 kg