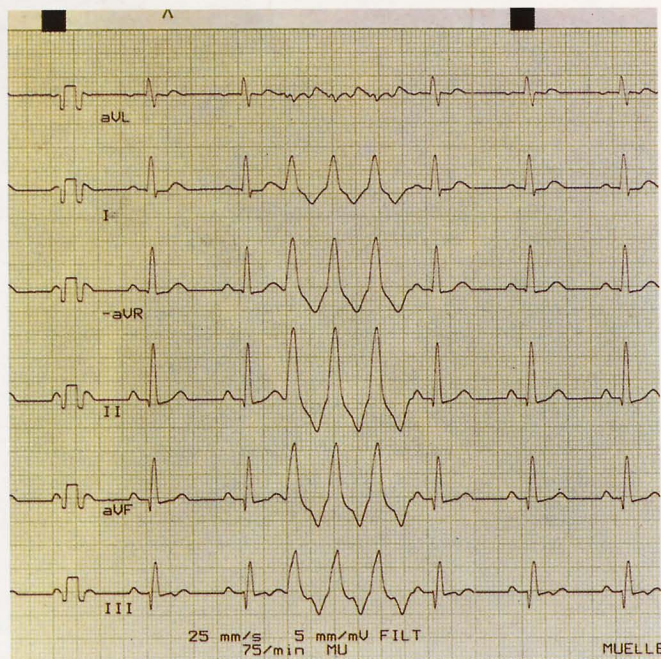


Concept:

The »phantom 320« is a newly developed tester for all ECG devices. First class technique, exclusive details and easy usage are the advantages of this ECG simulator.

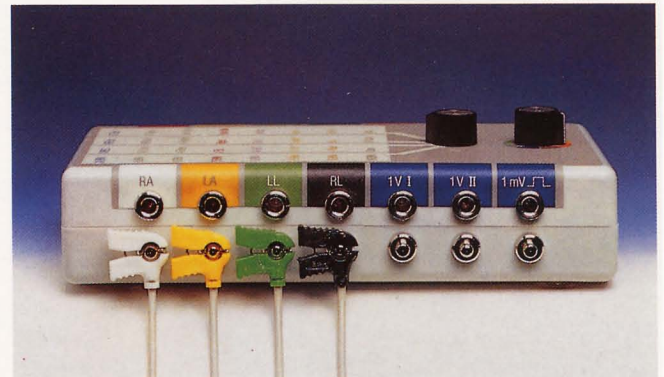
The new digital storage technology of the »phantom 320« guarantees an independent ECG wave for every lead (up to 12)!



Every simulation is possible with up to 12 leads.

Connections:

The »phantom 320« has standard connections for up to twelve ECG leads. ECG cables with clips or with plugs can be directly connected to the device.



The jacks are color coded. Each color on the device correlates to the color on a standardized ECG cable. Additionally, the jacks are labeled for each lead (e.g. RA, LA, LL ...).

Thus, mistakes are almost impossible.

The »phantom 320« also has a 1 mV/1 Hz connection (square signal) and two 1 V connections for devices without amplifiers (e.g. additional monitors).

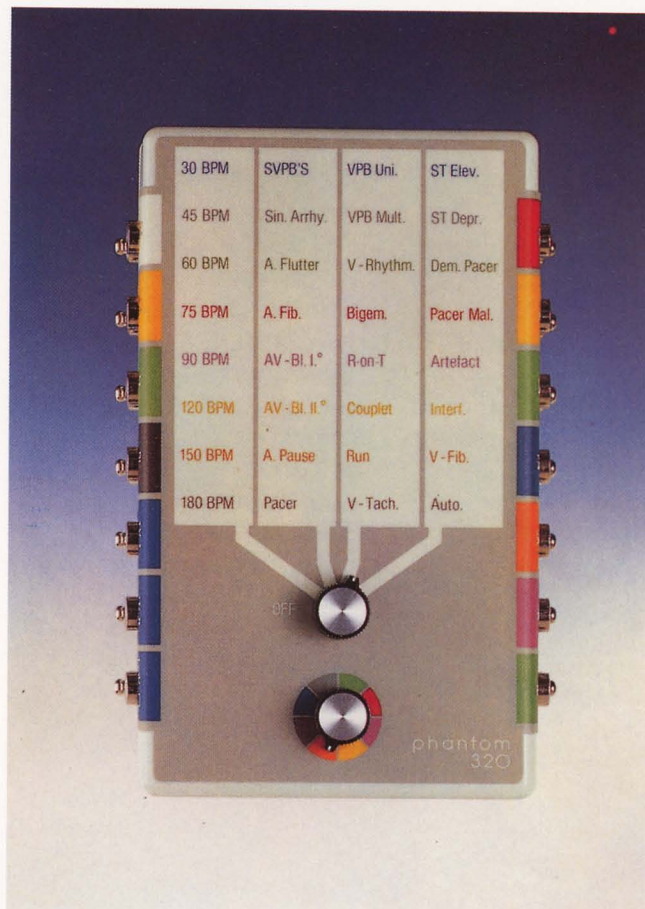
Programs:

The »phantom 320« has a total of 32 programs for checking ECG devices. The following ECG signals can be simulated:

1	30 BPM	Normal Sinus Rhythm, HR = 30 BPM
2	45 BPM	Normal Sinus Rhythm, HR = 45 BPM
3	60 BPM	Normal Sinus Rhythm, HR = 60 BPM
4	75 BPM	Normal Sinus Rhythm, HR = 75 BPM
5	90 BPM	Normal Sinus Rhythm, HR = 90 BPM
6	120 BPM	Normal Sinus Rhythm, HR = 120 BPM
7	150 BPM	Normal Sinus Rhythm, HR = 150 BPM
8	180 BPM	Normal Sinus Rhythm, HR = 180 BPM
9	SVB'S	Supraventricular Premature Beats
10	Sin. Arrhy.	Sinus Arrhythmia
11	A. Flutter	Atrial Flutter
12	A. Fib.	Atrial Fibrillation
13	AV-Bl. I.°	AV-Block, First Degree
14	AV-Bl. II.°	AV-Block, Second Degree
15	A. Pause	Atrial Pauses (>2,5 Sec.)
16	Pacer	Artificial Pacemaker Rhythm
17	VPB Uni.	Unifocal Ventricular Premature Beats
18	VPB Mult.	Multifocal Ventricular Premature Beats
19	V-Rhythm	Ventricular Rhythm
20	Bigem.	Bigeminy
21	R-on-T	R-on-T Phenomena
22	Couplet	Ventricular Premature Beats-Couplets
23	Run	Ventricular Premature Beats-Runs of 3 VPB's
24	V-Tach.	Ventricular Tachycardia
25	ST Elev.	ST-Segment Elevation
26	ST-Depr.	ST-Segment Depression
27	Dem. Pacer.	Ventricular Demand Pacemaker
28	Pacer Mal.	Pacemaker Malfunction
29	Artefact	Sinus Rhythm with Artefact
30	Interf.	Sinus Rhythm with 50/60 Hz Interference
31	V-Fib.	Ventricular Fibrillation
32	Auto.	Automatic Arrhythmia Program (17 Min.)

The »phantom 320« offers a special 17 minute arrhythmia program with a selection of different pathological signals (program 32).

Program Selection:



The »phantom 320« has two selector knobs for program selection. The first knob is for choosing a program column and the second knob is for the program row.

If you want to simulate e. g. runs, select the third column with the first knob and the color orange with the second knob. (orange = 7th program row.). (see picture above)

Please note that the color code of the second knob pertains only to the 4 columns on the front side of the device!

Technique:

Leads	12 leads: I, II, III, RA, LA, LL, V1-6	Wave forms	8 sinus rhythms (normal PQRST) bradycardia tachycardia
Connections	14 banana jacks 4 mm 14 connectors for press-button, clamp and clip		7 supraventricular arrhythmias 9 ventricular arrhythmias 3 pacemaker
Identification	electrode identification and color code DIN IEC 62D(CO)6 CODE2		2 ST deviations (elevation and depression) ECG with artifacts ECG with 50 and 60 Hz Hum
1 Volt-ECG	2 independent orthogonal leads: 1 VI and 1 VII		30, 45, 60, 75, 90, 120, 150 and 180 BPM
Square signal	1 mV / 1 Hz	Heart rates	
Storage	digital storage 1,6 MB	Basic rate	75 BPM in all arrhythmia programs
Amplitude resolution	8-Bit	Signal width	PQ, QRS and QT dependent upon R-R interval
Scanning frequency	256 Hz	Battery	standard 2 x 1,5 V LR6
Signal bandwidth	0-120 Hz	Battery life	approx. 100 hours continuous operation
Signal amplitude	0,25-3,0 mV +/- 2%		
Time base	32768 Hz Quartz	Dimensions	150 mm (D) x 100 mm (W) x 40 mm (H)
Impedance	electrode connections: approx. 20 Ohm 1 V ECG: 100 Ohm 1 mV square: 10 Ohm	Weight	400 g
Program selection	32 programs		



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