

# Impedance Cardiography (ICG)

## Competitor Overview

## Medis ▶ Niccomo

### Device:

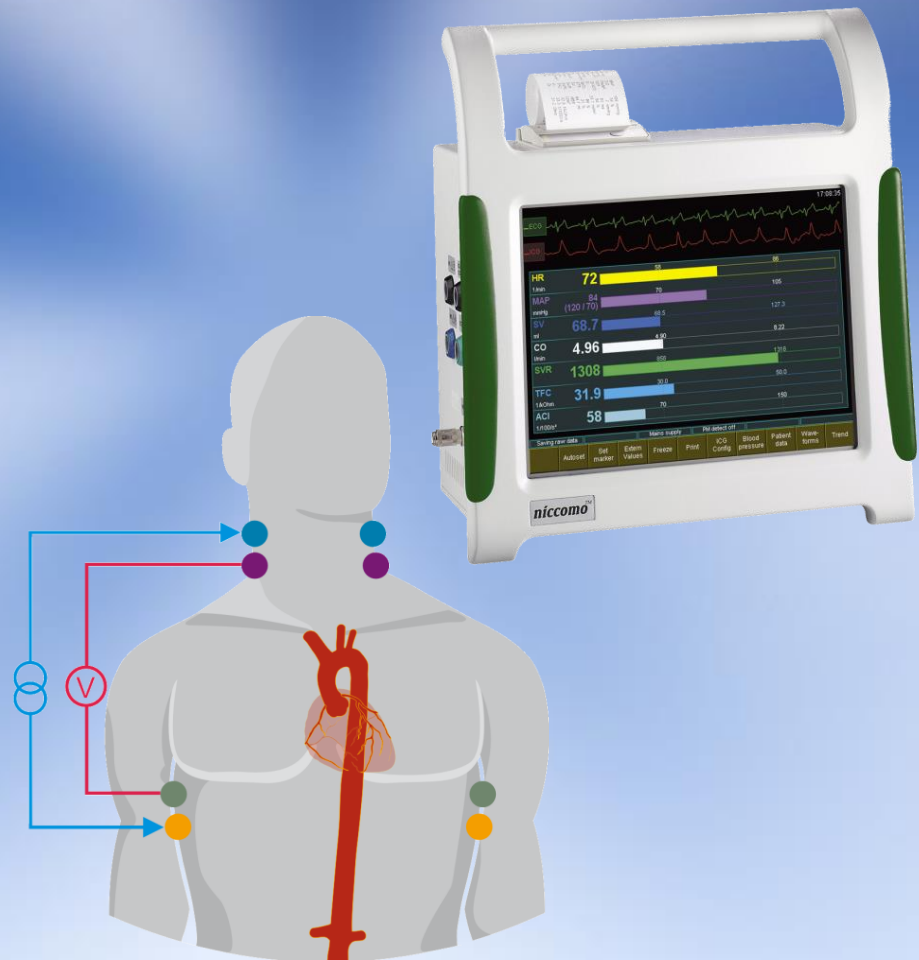
- Integrated Monitor
- Touchscreen operation

### Application:

- 4 dual-sensors

### Additional Modules:

- NIBP
- SpO<sub>2</sub>
- PWV



## Osypka Medical (Germany) ▶ AESCULON

### Device:

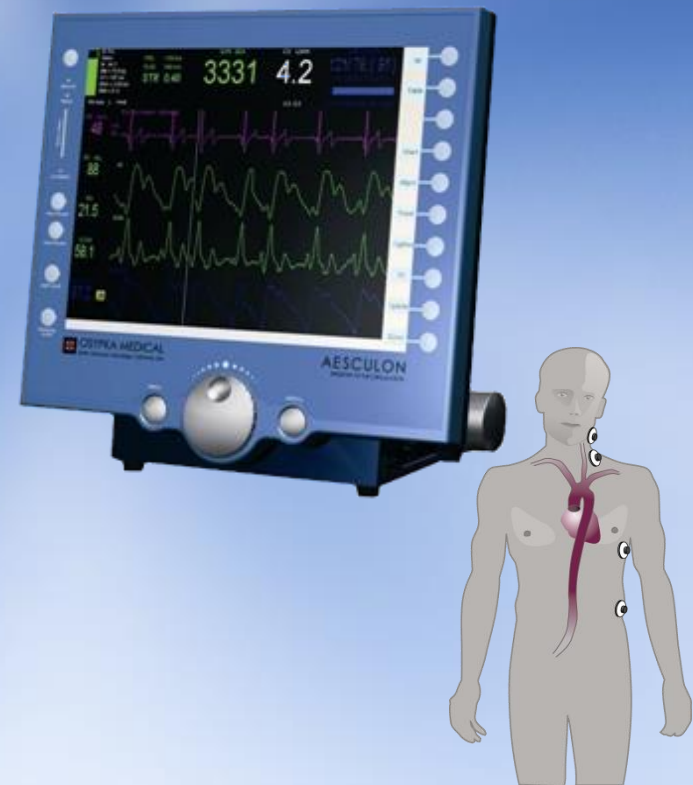
- Integrated Monitor
- Soft- and Hardkey operation

### Application:

- 4 electrodes (measuring “electrical-velocimetry”)

### Additional Modules:

- NIBP
- SpO<sub>2</sub>



## Cheetah Medical (Israel) ▶ NICOM

### Device:

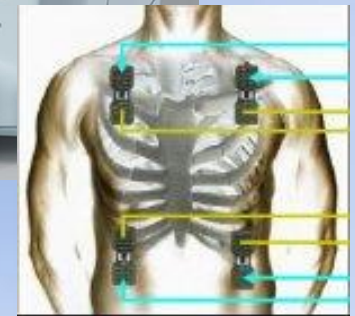
- Integrated Monitor
- Soft- and Hardkey operation

### Application:

- 4 dual sensor (measuring “bioreactance”)

### Additional Modules:

- NIBP



## Analogic (USA) ▶ Lifeguard II

### Device:

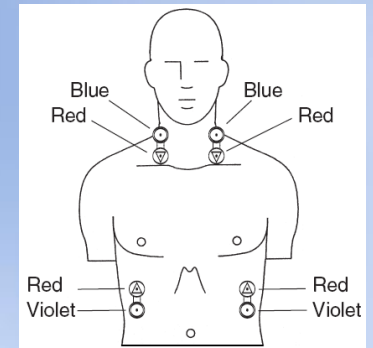
- Integrated Monitor
- Soft- and Hardkey operation

### Application:

- 4 dual-electrodes

### Additional Modules:

- NIBP
- SpO<sub>2</sub>



## CN-Systems (Austria) ▶ Task-Force Monitor

### Device:

- PC-operated

### Application:

- 3 electrode bands

### Additional Modules:

- 3-channel ECG
- NIBP and CNAP





## Hemosapiens (Romania) ▶ EXT-TEBCO

### Device:

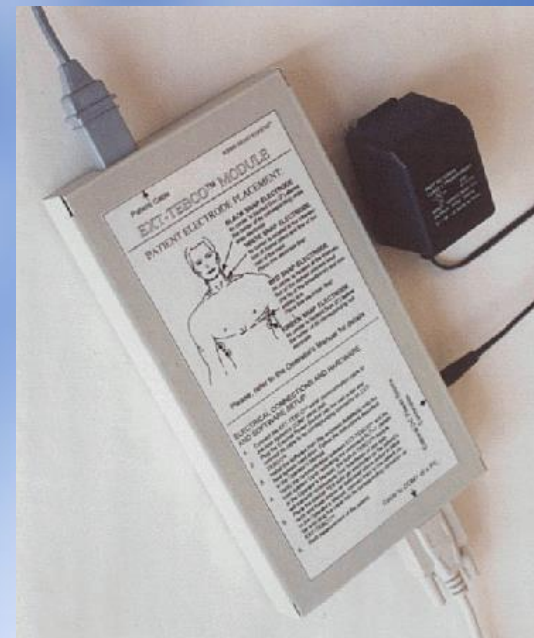
- PC-operated

### Application:

- 8 electrodes

### Additional Modules:

- none



## Manatec biomedical (France) ▶ PhysioFlow

### Device:

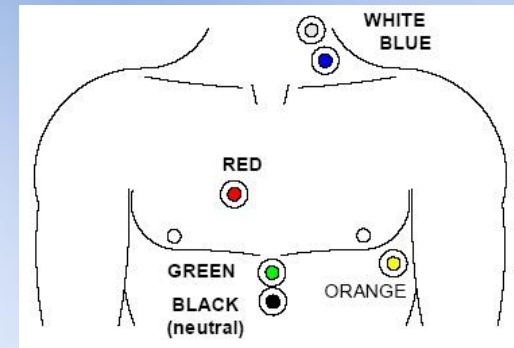
- PC-operated

### Application:

- 6 electrodes

### Additional Modules:

- none

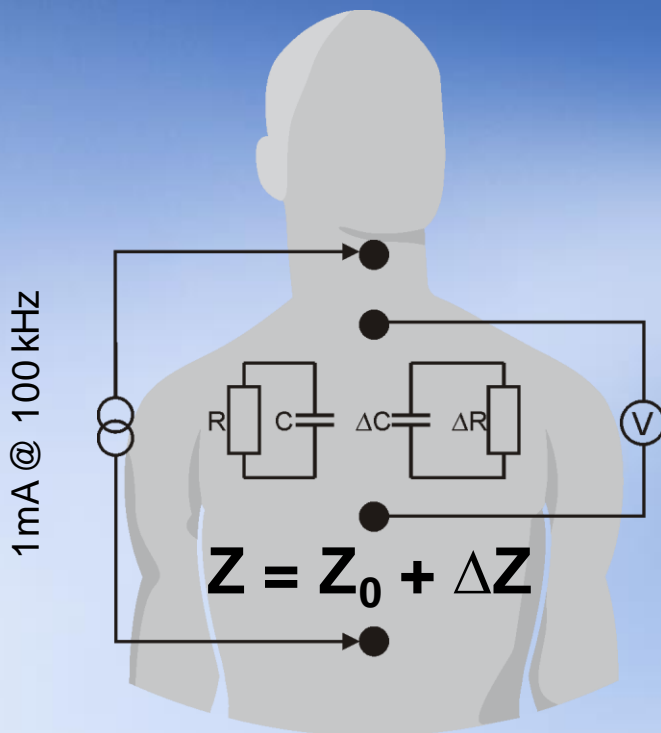




# Impedance Cardiography (ICG)

## Method variation overview

electrical

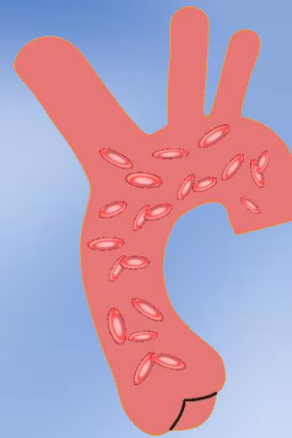


$Z_0$  - basic impedance

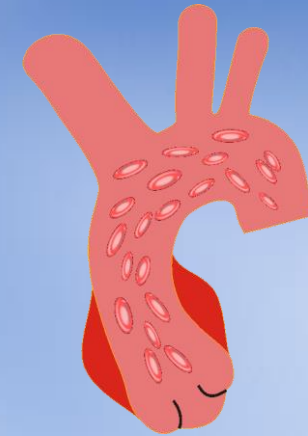
$\Delta Z$  - impedance change

mechanical

Systole



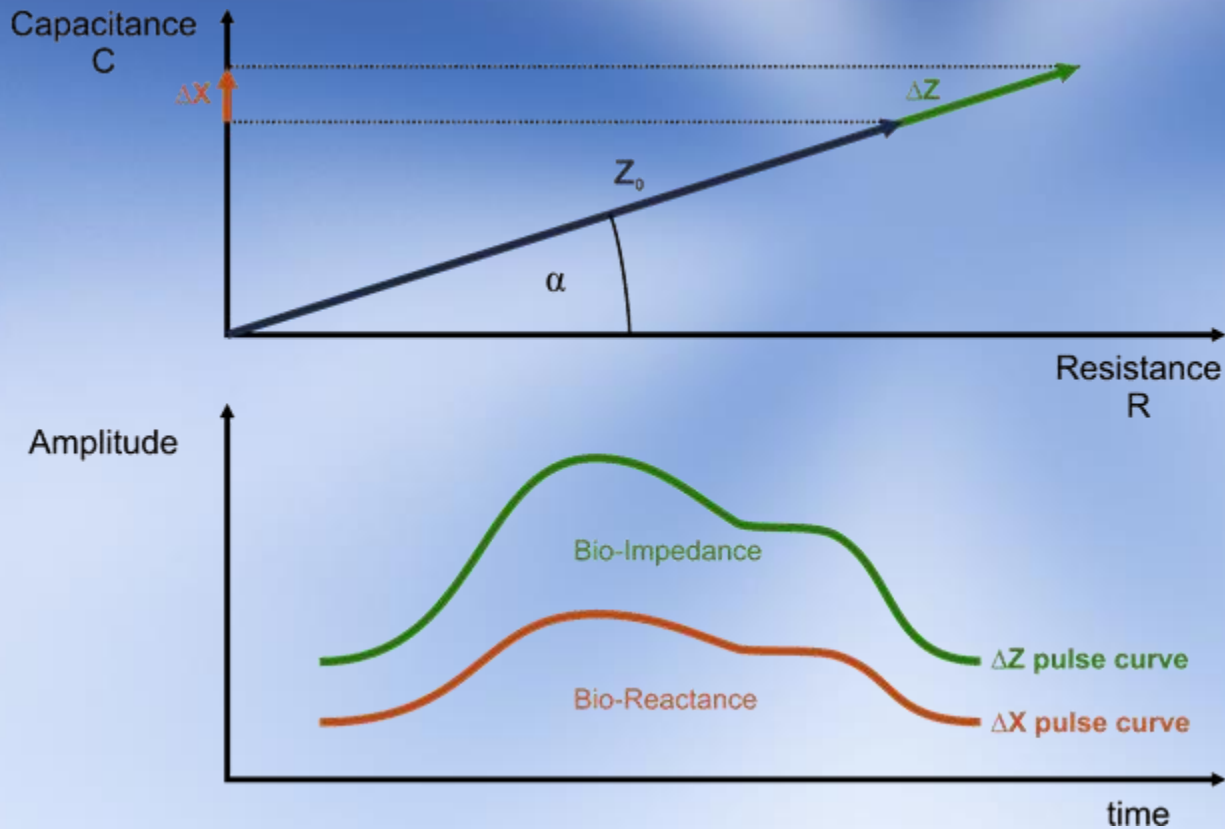
Diastole



Volume change in the thorax (also artefacts) influence both resistance AND capacitance

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► Phase shift  $\Delta X$  and impedance change  $\Delta Z$  have the same behavior

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