

MEDICAL

Body composition analysis systems from HealthCare GmbH



BIACORPUS RX 4000 BODY COMPOSITION ANALYSIS

BIACORPUS RX 4000

MODERN TECHNOLOGY – RELIABLE RESULTS

Modern nutritional medicine no longer evaluates a person's state of health and nutrition based on body weight, but instead analyzes the body composition using bioelectric impedance analysis (BIA). Changes in body weight can be caused by changes in body water, fat, or muscles – which means it is necessary to take the individual body compartments into account when evaluating the success of a weight-loss program [1].

For many years, bioelectric impedance analysis (BIA) has been recognized as an easy, fast, and non-invasive method of measuring body composition. A reliable analysis of developments in the body's condition can be obtained with very little time and effort. In 2004 the *European Society for Clinical Nutrition and Metabolism* (ESPEN) established European guidelines for BIA methodology and application, laying the groundwork for the successful employment of bioelectric impedance analysis (BIA) [1].

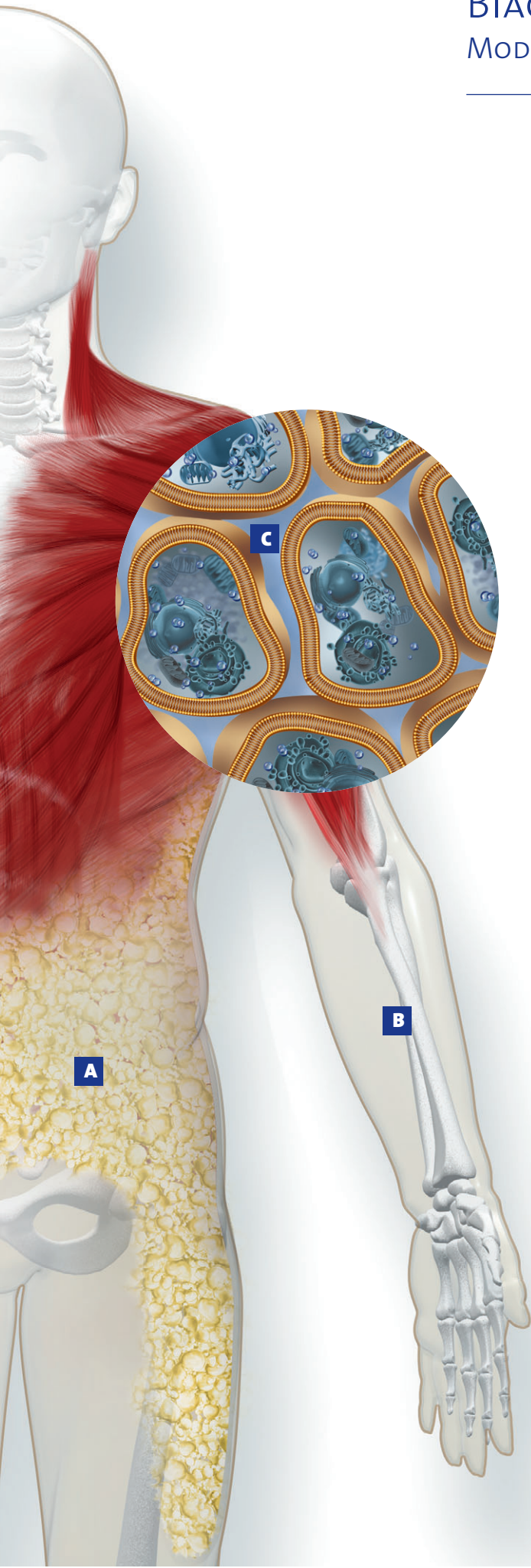
The phase-sensitive measurement method of the **BIACORPUS RX 4000** uses the different conductivity of the individual compartments to determine body composition. A weak alternating current is applied to measure the body's resistance and the phase angle:

- **Rz** = ohmic resistance to determine body water
- **Xc** = capacitive resistance for the measurement of body cells (musculature)
- **Phase angle (PA)** = phase shift in current and voltage that occurs when flowing through the cells of the body. The phase angle is often cited as the most important parameter for evaluating body cell mass/musculature [1].

A LOOK INSIDE THE BODY

The following compartments can be evaluated using the **BIACORPUS RX 4000**:

- Fat mass (A)
- Nonfat mass (B) incl. body cell mass (BCM)
- Total body water (TBW)
- Water distribution in the extracellular/intercellular space (C)



BIACORPUS RX 4000

SEGMENTAL, PHASE-SENSITIVE IMPEDANCE ANALYSIS

In classical BIA measurement, the right half of the body is usually evaluated. The assessment model for this one-sided measurement assumes that the shape of the body is a symmetrical and uniform cylinder. This assumption is a major oversimplification; on no account should the body be viewed as a cylinder, but at the very least as a series of several cylinders.

The **BIACORPUS SEGMENTAL MODEL** sees the arms, legs, and torso as individual cylinders (segments). When we break down the percentage of resistance in these different segments, we observe that, taken together, the arms and legs are responsible for approx. 88 - 94% of the body's resistance. The torso only delivers approx. 6 - 12% of the resistance.

SEGMENTAL EVALUATION ENSURES PRECISION

Segmental measurement of the extremities is essential for a precise assessment, especially in cases of localized edema and water retention or strongly divergent body symmetry (e.g. truncal obesity versus peripheral obesity). Because the torso only makes up approx. 10% of the body's resistance but the mass of the torso often represents 50% of body weight, changes within the torso can only be measured with difficulty. If we know precisely what changes have occurred in the extremities, however, we can calculate back to the torso. By this means, segmental measurement also assists in achieving a correct measurement of the torso.

PERFORMING SEGMENTAL BIACORPUS MEASUREMENT

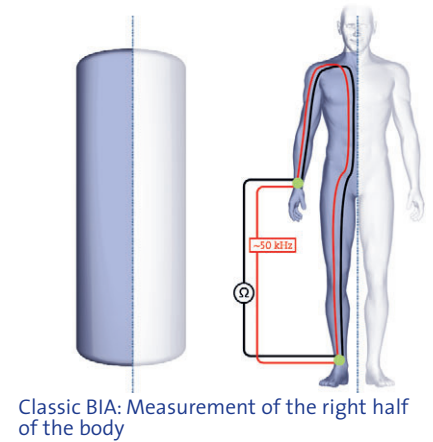
Practically speaking, it is very easy to carry out the measurements. Two electrodes each (total of 8 electrodes) are attached to the hands and feet of the person to be examined. The measurement process is started by the push of a button; the instrument then automatically measures all segments successively. After about 20 seconds the measurement is complete and the data can be transferred to the analysis systems manually or via USB interface.

SAMPLE ASSESSMENT

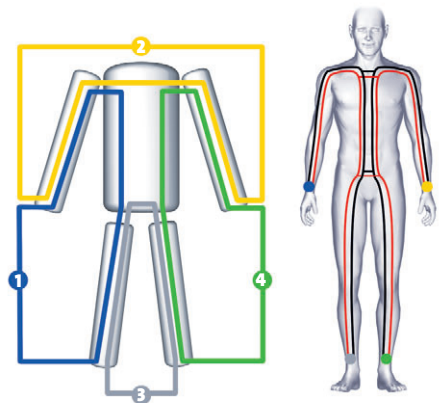
Segmental measurement data can be used for the statistical evaluation of the distribution of body fat and nonfat mass.

	RARF	RALA	RFLF	LALF
Rz	440	440	398	424
Xc	56	56	49	56
Pa	7,3	7,3	7,0	7,5

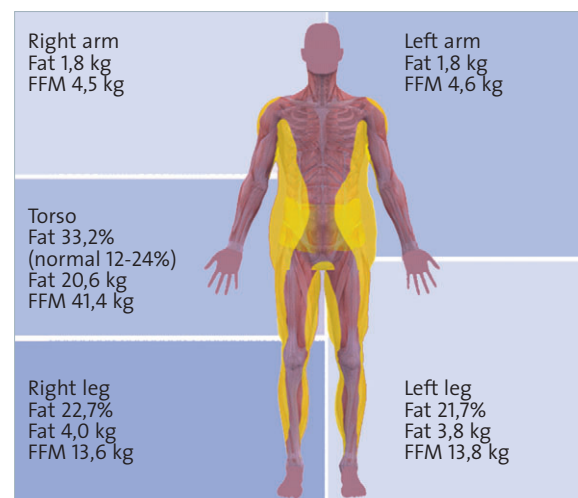
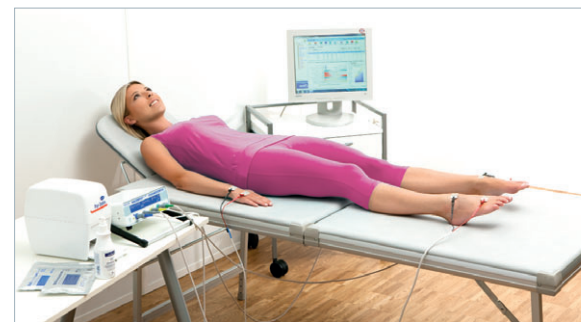
- Segment 1 right half of body (right arm - right foot RARF)
- Segment 2 upper body (right arm - left arm RALA); percentage of total resistance = 40%
- Segment 3 lower body (right foot - left foot RFLF); percentage of total resistance = 50%
- Segment 4 left half of body (left arm - left foot LALF)

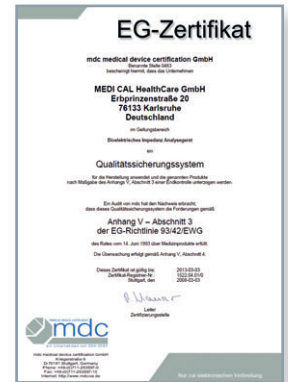


Classic BIA: Measurement of the right half of the body



BIACORPUS 4 segment model: Measurement of individual segments of the body





TECHNICAL DATA

Measurement parameters	Output unit
Rz (50 kHz)	Ohm
Xc (50 kHz)	Ohm
Phase angle (50 kHz)	degrees °

TECHNICAL INFORMATION

Duration of measurement	approx. 20 seconds
Data output	LC display, USB interface

DIMENSIONS

without handle (WxHxD):	22 x 7.7 x 18 cm
with handle (WxHxD):	22 x 7.7 x 27.5 cm

Weight:	1.5 kg
Measurement frequency:	50 kHz
Battery:	4 x NiMH rechargeable (max 2000 mAh)
Capacity:	approx. 5 hours
AC adaptor:	100 - 240 V, 50-60 Hz
Operating environment:	10 - 25 °C, relative humidity < 65%

Languages:	German, English, French, Italian
Medical device classification:	Ila

ORDERING INFORMATION:

BIACORPUS RX 4000

- BIACORPUS RX 4000 device
- 4 patient cables for segment measurement
- USB cable (3 m)
- AC adaptor
- Test resistor
- Carrying case
- 100 BIAPHASERTABS measurement electrodes

BIAPHASERTABS ELECTRODES

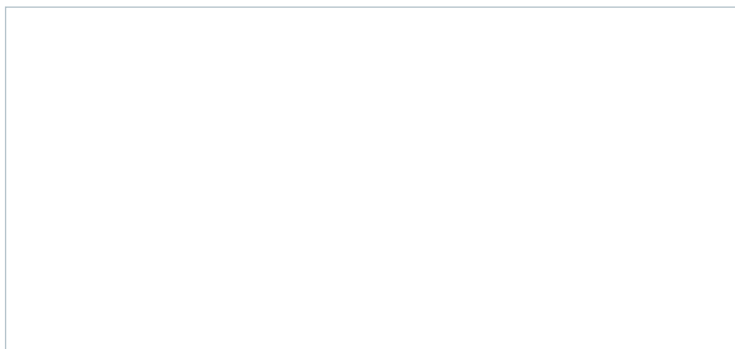
- 100 electrodes in reclosable aluminum packet, especially suitable for BIA measurement

MANUFACTURER



HealthCare GmbH
 MEDI CAL HealthCare GmbH
 Amalienbadstr. 41
 D-76227 Karlsruhe
 Tel.: +49 (0) 721 / 16 17 8 - 0
 Fax: +49 (0) 721 / 16 17 8 - 29
 E-Mail: info@medi-cal.de
 www.medi-cal.de

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idiag AG
 Mülistrasse 18
 CH - 8320 Fehraltorf
 Tel.: +41 44 908 58 58
 Fax: +41 44 908 58 59
 E-Mail: info@idiag.ch
 www.idiag.ch