

## Body measurements

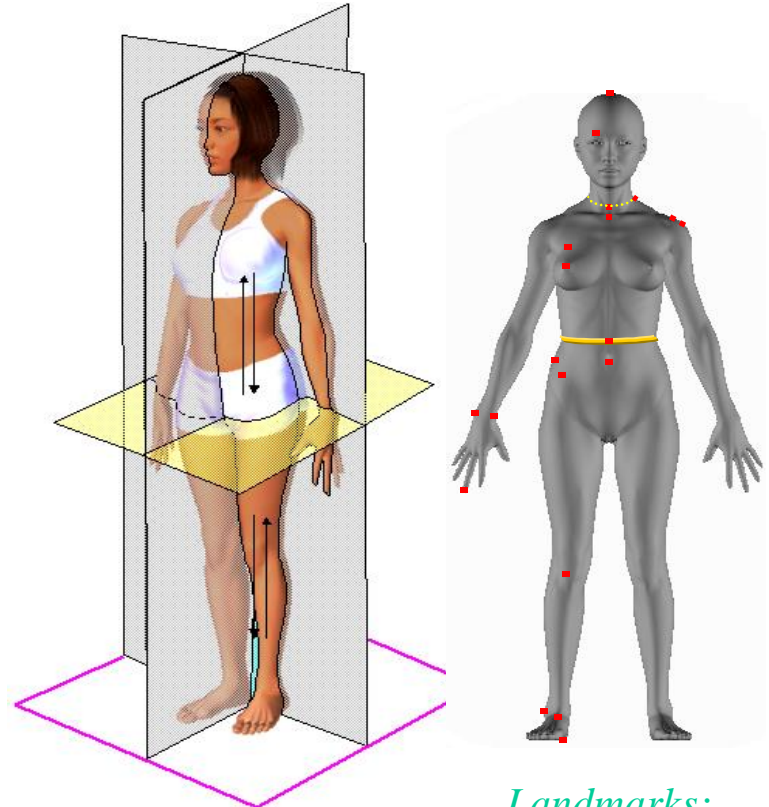
### Measurements, orientation on a body surface

#### ***The Human body is 3-dimensional***

We can mark basic geometric shapes on the **body surface** and use the human anatomy as the guide for the orientation on the body.

- Plains,
- Lines,
- Landmarks,

can divide and mark the human body. We can imagine how these forms clearly and accurately mark the surface of the human body. The virtual plains, lines and points enable us to measure the distances on the surface of a human body.



*Landmarks:  
Anatomical points*

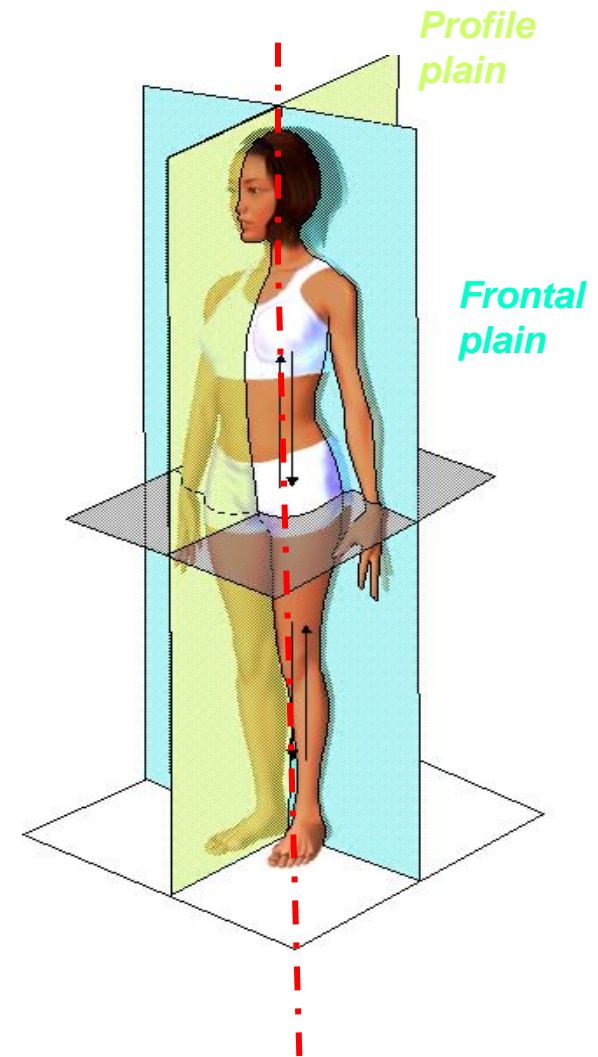
## The anatomy plains compendium

### Vertical plains

**Frontal plain** is parallel with forehead and divides the human body into front and rear sections.

**Profile plain (medial)**, is perpendicular to the frontal plane and divides the human body into the left and right section.

The intersection of the profile and frontal plain creates **the axis** of the human body.





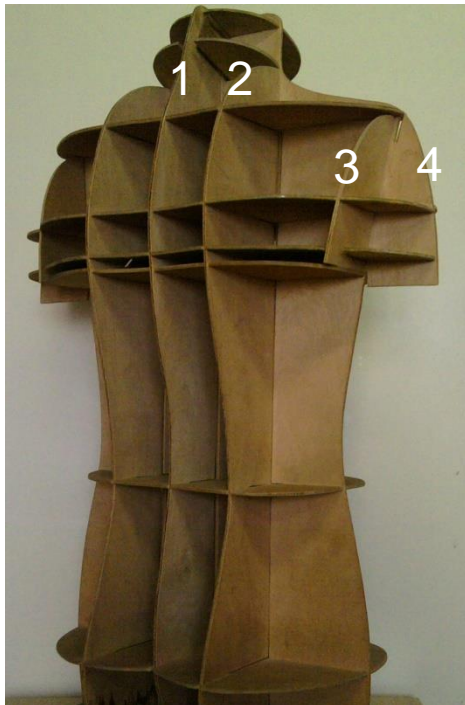
The parallel plains with the basic plain are *horizontal plains* and perpendicular to the *vertical plains*. Significant horizontal (transversal) plains, which are situated in important points on the human body surface, are e.g.

### Horizontal plains

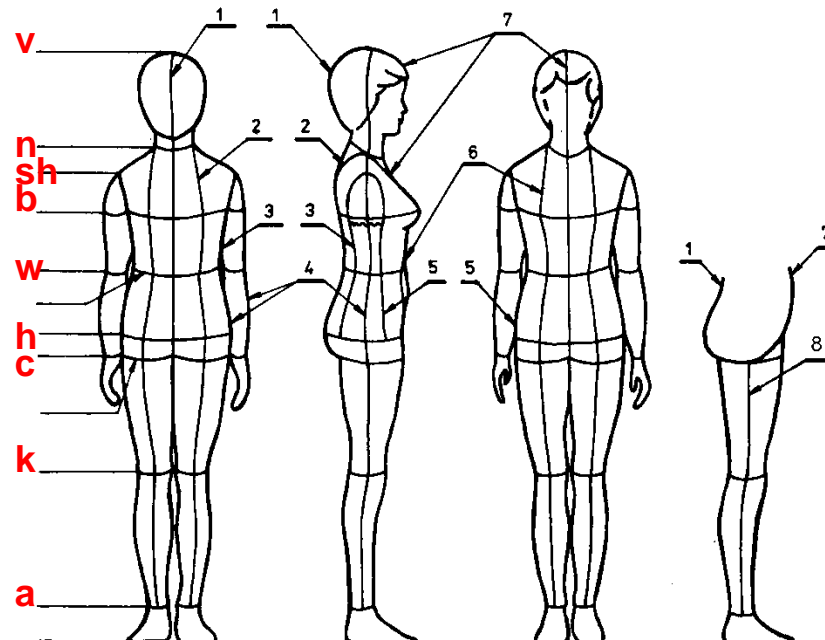
- v - vertex plain,
- n - neck plain,
- sh - shoulder plain,
- b - bust plain,
- w - waist plain,
- h - hip plain,
- c - crutch plain
- t - thigh plain,
- k - knee plain,
- a - ankle plain.

### Vertical plains

- 1 - centre back plain,
- 2 - side neck plain,
- 3 - back armhole plain,
- 4 - side plain,
- 5 - front armhole plain,
- 6 - chest plain,
- 7 - centre front plain,
- 8 - inside leg plain.



Back body



Basic plain



Front body

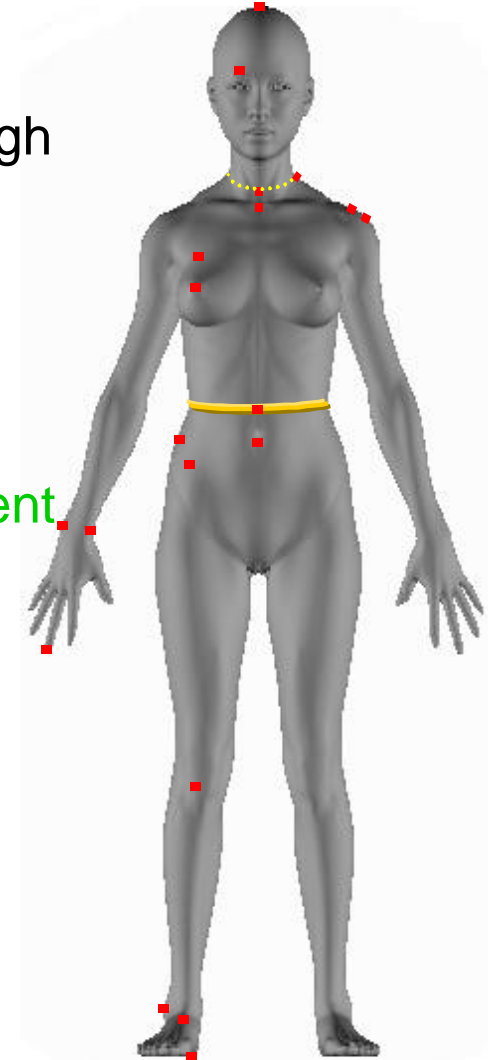


The names of these measurements are determined by the names of the anatomical plains that they go through the human body. e.g: *Waist plain – waist girth*

Through the imagine cross cuts of the body in the levels of the specific plains we achieve the shape of the cross section.

The circumference of the section is the body measurement - girth.

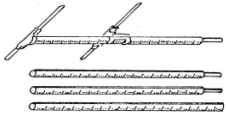
**Landmarks** are located by anatomical points and grouped according to their positions on the body. Clear landmarks with logical coding would be useful to explain all critical measurements for basic pattern development. From landmark points to body lines, all definitions and measuring methods should be standardised and commonly agreed.



*Landmarks:  
Anatomical points*

# Body measurements

measuring tool-  
anthropometre

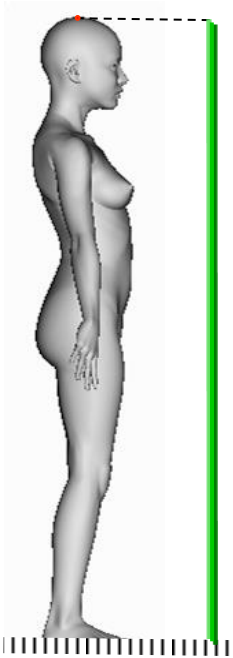


**Straight-lined  
(linear)**

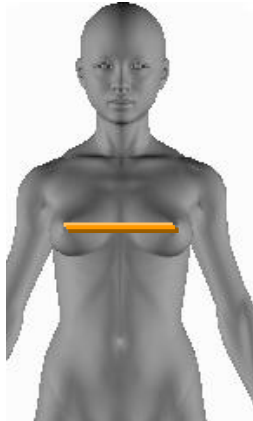
Height

Width

Front Profile



Stature



Bust prominence width



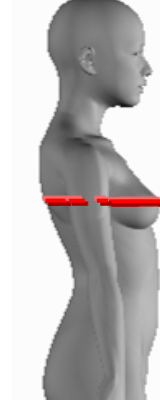
Head width



Under arm length



Shoulder width



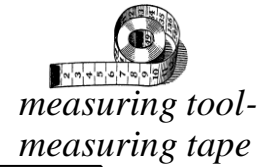
Bust girth

**Curves  
(non-linear)**

Length

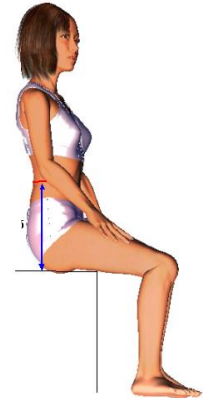
Width

Girth



measuring tool-  
measuring tape

**Others**



Crutch depth  
(Body rise)

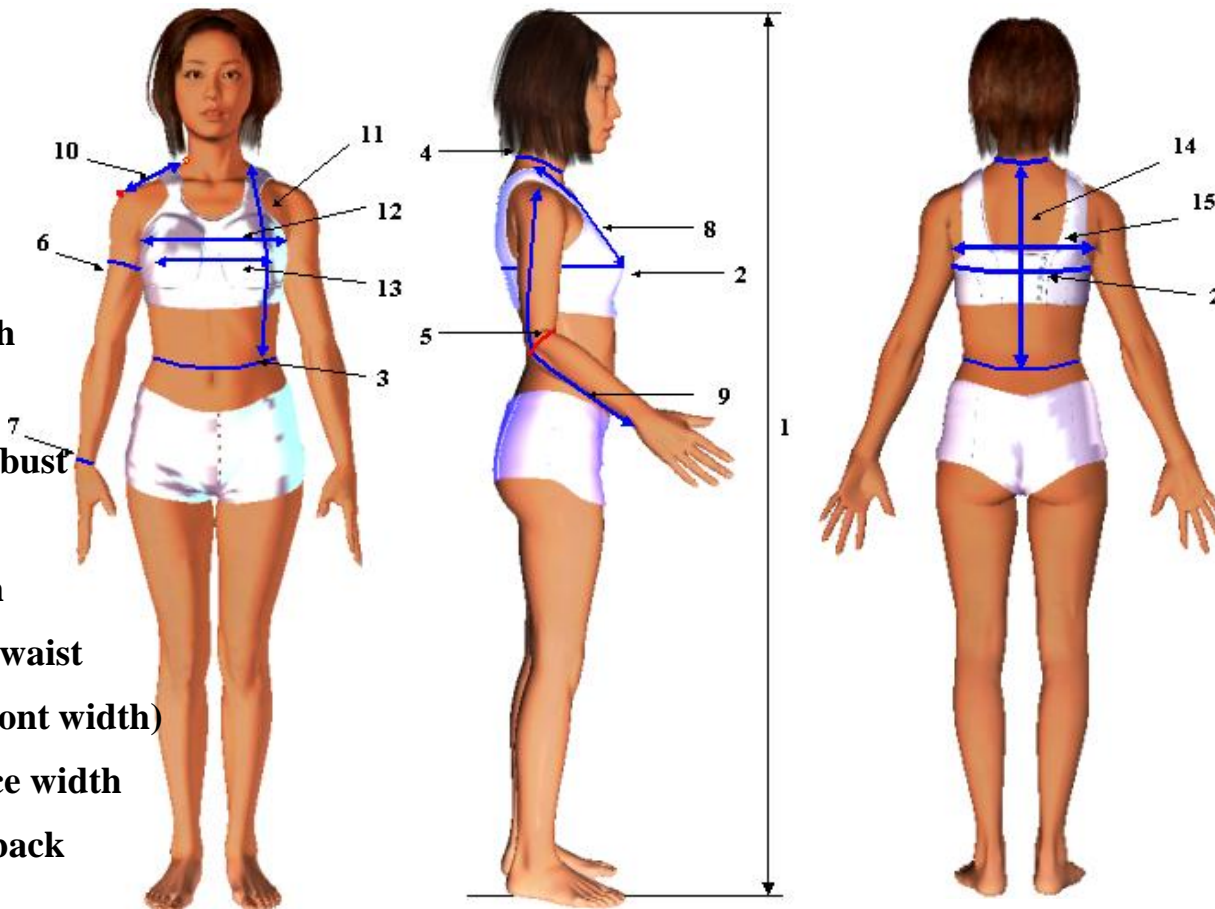
# Taking body measurements manually

## Measuring positions for bodice and sleeve



### Measurements

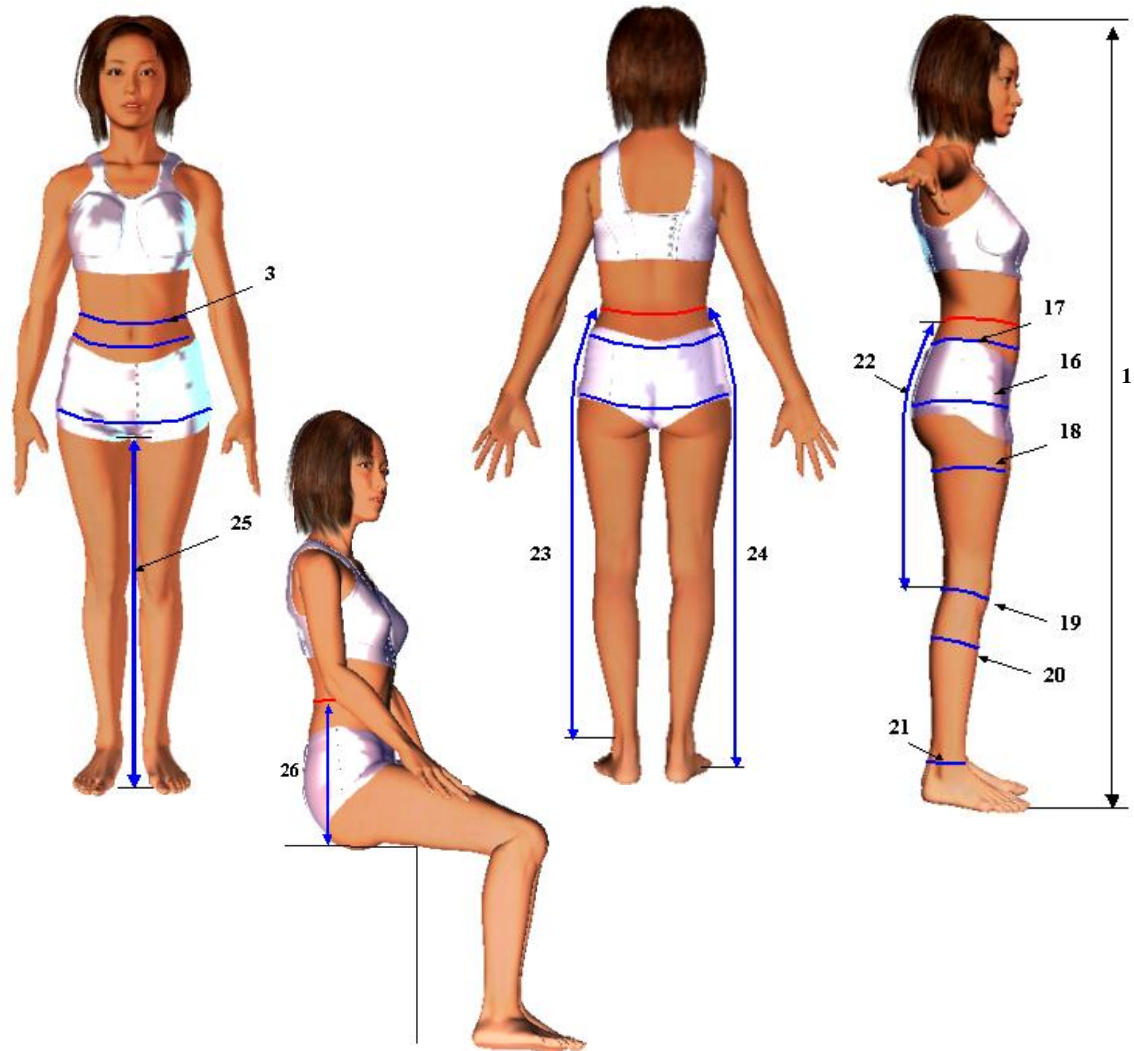
- |    |   |                |   |                             |
|----|---|----------------|---|-----------------------------|
| 1  | – | ( <i>h</i> )   | – | Body height                 |
| 2  | – | ( <i>bg</i> )  | – | Bust girth                  |
| 3  | – | ( <i>wg</i> )  | – | Waist girth                 |
| 4  | – | ( <i>ng</i> )  | – | Neck girth                  |
| 5  | – | ( <i>eg</i> )  | – | Elbow girth                 |
| 6  | – | ( <i>uag</i> ) | – | Upper arm girth             |
| 7  | – | ( <i>wrg</i> ) | – | Wrist girth                 |
| 8  | – | ( <i>bfl</i> ) | – | Front length to bust        |
| 9  | – | ( <i>al</i> )  | – | Arm length                  |
| 10 | – | ( <i>shl</i> ) | – | Shoulder length             |
| 11 | – | ( <i>wfl</i> ) | – | Front length to waist       |
| 12 | – | ( <i>fw</i> )  | – | Across front (front width)  |
| 13 | – | ( <i>bwp</i> ) | – | Bust prominence width       |
| 14 | – | ( <i>nw</i> )  | – | Nape to waist (back length) |
| 15 | – | ( <i>bw</i> )  | – | Across back (back width)    |



## Measuring positions for skirt and trousers

### Measurements

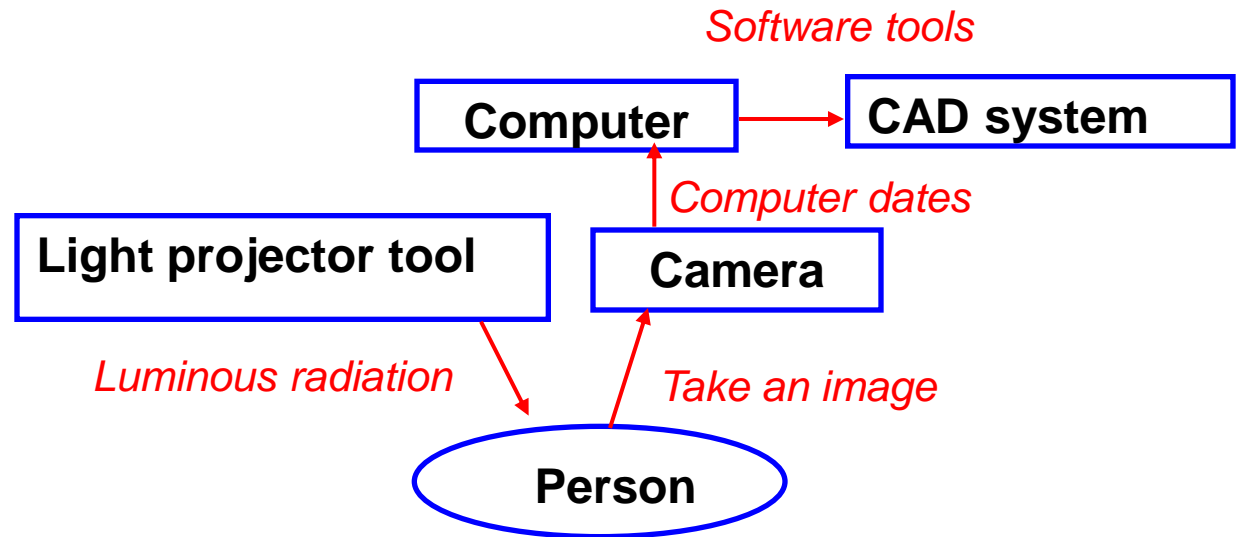
- |    |   |                |   |                                  |
|----|---|----------------|---|----------------------------------|
| 1  | – | ( <i>h</i> )   | – | Height                           |
| 3  | – | ( <i>wg</i> )  | – | Waist girth                      |
| 16 | – | ( <i>hg</i> )  | – | Hip girth                        |
| 17 | – | ( <i>uhg</i> ) | – | Upper hip girth                  |
| 18 | – | ( <i>tg</i> )  | – | Thigh girth                      |
| 19 | – | ( <i>kg</i> )  | – | Knee girth                       |
| 20 | – | ( <i>cg</i> )  | – | Calf girth                       |
| 21 | – | ( <i>ag</i> )  | – | Ankle girth                      |
| 22 | – | ( <i>kl</i> )  | – | Knee length<br>(waist to knee)   |
| 23 | – | ( <i>al</i> )  | – | Ankle length<br>(waist to ankle) |
| 24 | – | ( <i>llo</i> ) | – | Outside leg length               |
| 25 | – | ( <i>lli</i> ) | – | Inside leg length                |
| 26 | – | ( <i>cd</i> )  | – | Crutch depth<br>(Body rise)      |



## Computerised measuring systems

The techniques of computerised measuring have recently improved considerably and will supersede manual methods that use technologies and application of no contact body measurement and garment analysis systems in these categories:

- moire topography
- laser scanning
- infrared scanning
- photogrammetry
- structured white light



*General scheme of capturing somatometric dates*

One significant advantage of most 3D body scanners is the rapid scanning time and more accurate reproducible measurements. This machine generates an unlimited number of linear and non-linear measurements of the human body in just a few seconds.



## Reference

- MUSILOVA,B. KOMARKOVA,P. GLOMBIKOVA,V.*Basic pattern block construction*. Liberec:TUL 2003, ISBN 80-7083-687-3
- LINDSAY CARTER,J,E.HONEYMAN HEATH,B. *Somatotyping: Development and Applications* . Cambridge University Press 1999, ISBN 0521351170
- Aldrich, W. *Metric Pattern Cutting*. Manchester: Blackwell Publishing 2003, ISBN-1-4051-0278-0.
- Winks,J,M.*Clothing Sizes:International Standardization*. The textile institut Manchester 1997,ISBN 1870812727
- FAN,J.YU,W.HUNTER,L.*Clothing appearance and fit:Science and technology*.Woodhead Publishing Ltd,Cambridge2004,ISBN1855737450
- EBERLE,H. *Clothing technology*. Europa Lehrmittel Verlag 2008, ISBN-13: 978- 3808562246