



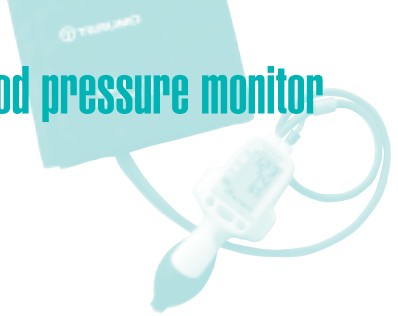
# Elemano®

## Digital blood pressure monitor

Advanced double cuff concept for professional accuracy



- Double cuff accuracy for professional users
- Flexible measurement selection – auscultatory and oscillometric
- Suitable for patients with faint pulse and hypotension
- Detection of abnormal condition
- Environmental friendly – 1000 measurements with one standard battery
- Fulfils AAMI guidelines



## Elemano®

The Elemano® blood pressure monitor is especially developed for professionals in the health care sector. High accuracy is the foremost mentioned concern of health care workers related to blood pressure monitors. Correct diagnosis and treatment of patients is based on the results of these measurements. The level of accuracy a blood pressure monitor can offer directly influences the safety and well-being of the patient. Terumo® therefore developed the Elemano®, a semi automatic blood pressure monitor using the oscillometric method. Thanks to the new and advanced technology of the “Terumo® Double Cuff Method” a very high level of accuracy is ensured.

### Professional accuracy:

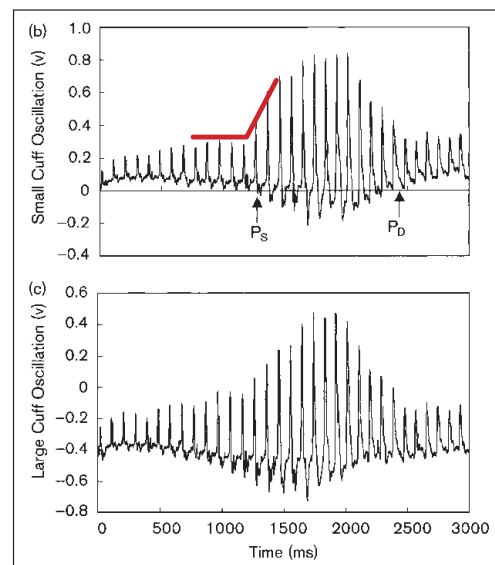
The Elemano® is a digital blood pressure monitor using the oscillometric method for detecting the blood pressure. Unlike other blood pressure monitors the Elemano® is equipped with the advanced concept of the double cuff. This method is using a large compression cuff dedicated to ischemia and a small cuff, placed in the centre of the compression cuff, to detect the oscillation of the arterial pulsation. A buffer sheet is inserted between the large and the small cuff in order to prevent transmission of pulsatile oscillations.



The compression pressure is highest in the central cuff region and decreases gradually towards both ends until it reaches almost zero. Consequently raising the cuff pressure above the SBP occludes the artery completely under the central cuff region but incomplete under the upstream side. Therefore when using only a large cuff, oscillations generated by the arterial pulsation under the upstream side contaminate the oscillation of the central cuff region by producing a constant oscillation within the large cuff.

Waveforms detected by the small cuff of the Elemano® is characterized by very clear detection points for the systolic blood pressure (SBP;  $P_s$ ) and diastolic blood pressure (DBP;  $P_d$ )

(Figure b), compared to waveforms detected by a large cuff in the conventional oscillometric method (Figure c). Therefore algorithms used in the Elemano® for the determination of the SBP and DBP were rendered more objective. A more accurate determination of the SBP and the DBP in comparison to the conventional method is guaranteed<sup>(1)</sup>.



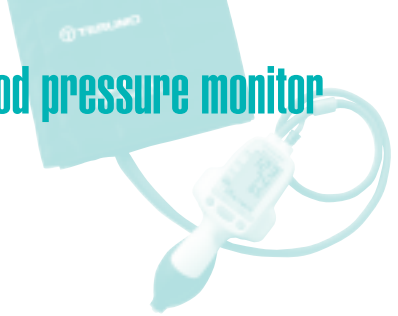
### Flexibility:

Depending on the patient's condition the Elemano® offers three different measurement modes:

- [Normal \(automatic\)](#)  
Effective for your routine BP measurement
- [Slow \(automatic\)](#)  
Slower exhaustion of the cuff after pressurization  
Especially suitable for patients with “Faint pulse” and “Hypotension”
- [Auscultation \(manual\)](#)  
For blood pressure measurement with a stethoscope (conventional method)



This flexibility enables the use of the Elemano® both by doctors and nurses showing a preference for the oscillometric method and by those favoring the standard auscultatory method.



## Detection of abnormal conditions:

The Elemano® is able to detect measurements obtained under an abnormal condition such as extreme arrhythmia or weak pulse. A flashing display indicates that the measurement was taken under such conditions. In this case it is recommended to reconfirm the measurement using the auscultatory mode.

## Lightweight:

The Elemano® is with 130g a lightweight device which enables an easy transfer from room to room.

## Environmental friendly:

With one standard or rechargeable battery (AA dry cell 1,5V DC or 1,2V DC) the Elemano® provides around 1000 measurements, therefore reducing the waste load and contributing to a cleaner environment.

## Easy handling:

The Elemano® supports an easy handling for all medical staff. It enables an easy introduction into a department and training of staff is requesting limited time.

## Specifications:

Measurement method	Oscillometric (double cuff supported)
Displayed measurements	Systolic blood pressure, diastolic blood pressure, pulse rate (pulse waves)
Measurement range	(Pressure) 0 - 320mmHg (0 - 42.7kPa) (Pulse rate) 30 - 199 beats/min
Accuracy	(Pressure) $\pm 3$ mmHg ( $\pm 0.4$ kPa) (Pulse rate) $\pm 5\%$
Pressurization method	Manual
Decompression method	Automatic
Measurement area	Upper arm
Warnings	Insufficient and excessive pressurization, pulse outside measurement range, weak pulse or extreme arrhythmia
Errors	Relevant error codes are displayed (please consult IFU)
Automatic power off	After 3 minutes without input on the operation panel
Number of measurements	About 1000 measurements per battery
Power supply	AA dry cell x1 or AA rechargeable battery x1
Operating conditions	Temperature: 10 - 40°C; Humidity: 30 - 85%RH (no condensation)
Storage conditions	Temperature: - 20 - 60°C; Humidity: 10 - 95%RH (no condensation)
Classification	MDD class IIa, Internally powered equipment, Type BF, continuous operation, IPX0
Dimension	Main body: (w) 70 mm × (h) 46 mm × (d) 169 mm Cuff (size M): (w) 150 mm × (l) 520 mm
Weight:	Main body: 130 g (excluding the battery) Cuff (size M): Approx.150 g
Validation:	The Elemano® was tested on 87 persons to compare its accuracy with that of the auscultatory method according to the AAMI SP-10 protocol <sup>(1)</sup> . The results prove that the Elemano® fulfils the AAMI criteria. This unit is also designed in accordance with the European standard EN1060, Non-invasive sphygmomanometers Part1. General requirements and Part3. Supplementary requirements for electro-mechanical blood pressure measuring systems, and complies with EMC standard (electromagnetic compatibility, IEC 60601-1-2:2001)

REMARK: Specifications are subject to change for improvement without prior notice.

## Blood pressure monitor and accessories:

To enable the right choice of the cuff size and meet the hygiene requirements of a medical environment, Terumo® offers a washable nylon cuff cover and four sizes (SS, S, M, L) to meet those requirements.

Product		Product code
<b>Elemano® - Semi-automatic blood pressure monitor</b> (incl. Monitor, M-size nylon cuff, 2 x batteries, multi-lingual IFU)		<b>ES*H5502</b>
<b>Cuff</b> (washable nylon cuff cover + inner cuff)		
Extra small	13-20 cm (arm circumference)	<b>XX*ES11SS03</b>
Small	17-26 cm (arm circumference)	<b>XX*ES11S03</b>
Medium	24-32 cm (arm circumference)	<b>XX*ES11M03</b>
Large	32-42 cm (arm circumference)	<b>XX*ES11L03</b>
<b>Cuff cover</b> (washable nylon cuff cover)		
Extra small	13-20 cm (arm circumference)	<b>XX*ES14SS03</b>
Small	17-26 cm (arm circumference)	<b>XX*ES14S03</b>
Medium	24-32 cm (arm circumference)	<b>XX*ES14M03</b>
Large	32-42 cm (arm circumference)	<b>XX*ES14L03</b>
<b>Inflation bulb</b>		<b>XX*ES18</b>
<b>Storage bag</b>		<b>XX*ES17</b>
<b>Accuracy check parts</b>		<b>XX*ES16</b>

### References:

<sup>(1)</sup> Accuracy and applicability of the Terumo® ES-H55 double-cuff sphygmomanometer for hospital use

Osamu Tochikubo, Kiyoko Nishijima, Kenji Ohshige and Kazuo Kimura - Blood Pressure Monitoring 2003, 8:203-209

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