

Reflect your health

<b>Measuring method:</b>	Reflection spectroscopy
<b>Light source:</b>	2 Xenon - lamps
<b>Power source:</b>	6 NiMH rechargeable batteries, or 6 normal batteries (alkaline), size 'AA', 'Mignon' or 'LR6' or the 'FRIWO FW7556M/15' mains adapter
<b>Operating temperature / humidity range:</b>	+10 to +40°C; relative humidity 10 to 85%, no condensation
<b>Storage temperature / humidity range:</b>	-10 to +60°C, relative humidity 10 to 95%, no condensation
<b>Dimension:</b>	20,8 cm (W) × 11,5 cm (H) × 4,0 cm (D)
<b>Weight:</b>	544 g (with 6 batteries)
<b>Accessories:</b>	Sensor, calibration holder, calibration plug, main adapter (type 'FRIWO FW7556M/15'), USB cable, rechargeable batteries (6 off), Protective caps for fibre-optic light guide S (set: 1 x large + 3 x small)

Measurement parameters Hb:	
Total Haemoglobin	tHb (g/dL), (g/L), (mmol/L)
Oxygenated Haemoglobin	HbO <sub>2</sub> (g/dL), (g/L), (mmol/L)
Desoxygenated Haemoglobin	Hb (g/dL), (g/L), (mmol/L)

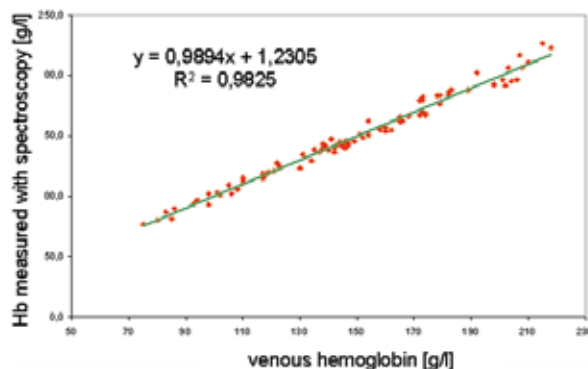
Measurement parameters Tissue:	
Tissue oxygenation	oxygenation (%)
Tissue haemoglobin	Tissue tHb (g/dL), (g/L), (mmol/L)
Oxygenated tissue haemoglobin	Tissue HbO <sub>2</sub> (g/dL), (g/L), (mmol/L)
Volume percentage of haemoglobin (tHb) in tissue	percent tHb (%)
Water content (% per g of tissue)	water (%)
Mean vascular radius (capillaries, arterioles, venules)	capillar radius (µm)



### Source:

Z Geburtsh Neonatol 2003; 207

“Non-invasive transcutaneous measurement of Hemoglobin by pretermes and newborns using white light spectroscopy.“



### Current studies

Studies and publications will be regularly released on our homepage [www.mbr-optical-systems.com](http://www.mbr-optical-systems.com)

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## Application possibilities

### Pediatrics

- ✓ Ideal for prematures or newborns  
→ needle free, no pain,  
no blood detection of anaemia in children
- ✓ Detection of anaemia in children
- ✓ Early detection of rheumatic diseases by measuring  
frequency of vasomotion

### Emergency physician / ambulance

- ✓ Monitoring of tissue perfusion
- ✓ Availability of oxygen in the local tissue

### Vascular Surgery

- ✓ To check if new vessels already grow in the transplanted  
skin tissue after transplantation
- ✓ By-pass operation, vessel prosthesis, recanalization

### Anesthesia

- ✓ Long-time monitoring with button sensor during the  
operation and ICU
- ✓ Controlling for a sufficient blood supply
- ✓ Long-time monitoring during the transfusion

### Blood Donor Centre / Health organization

- ✓ Preselection of blood donors
- ✓ Scanning of anaemia in the developing countries

### Blood bank

- ✓ Quality control of blood preservation



## Principle of operation

A sensor head placed on the skin projects a white light into the underlying tissue via a waveguide. Some of the projected light is absorbed by the various components of tissue, while some of it is reflected.

Another waveguide transmits the light reflected as a result of the physical conditions back to the device. A spectrometer breaks the light down into its separate wavelengths and an electronic evaluation unit connected to the system analyses it.

The resulting data is then processed using an algorithm developed by MBR and visualised on the display of the device in the form of quantitative values measured for the parameters described above.

Individual measurements and continuous measurements can also be carried out online. The device is powered by batteries. A matching intelligent charger is included, so the batteries will not be overloaded. With fully charged batteries, the device can measure for at least five hours in continuous operation.

